REQUEST FOR MINISTERIAL RECONSIDERATION

Notice to Dispose dated December 31, 2024

and

Exemption Denial dated January 10, 2025

Ostrich Flock H5N1 Recovery
237 Days Post-Infection

Risk-Managed Alternative Control Protocol
Under Section 13(2)(a) of the Health of Animals Act

Submitted to:

The Honourable Lawrence MacAulay
Minister of Agriculture and Agri-Food

Dr. Mary Jane Ireland
Chief Veterinary Officer
Canadian Food Inspection Agency

Dr. Harpreet S. Kochhar
President
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Submitted by:

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Date of Submission: September 9, 2025

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BRIEFING NOTE FOR THE MINISTER OF AGRICULTURE AND AGRI-FOOD

Subject: Urgent Request for Reconsideration and Dialogue - H5N1 Recovery at Universal Ostrich Farms
Date: September 9, 2025
Submitted by: Universal Ostrich Farms Inc.

PURPOSE

We respectfully request urgent ministerial reconsideration of the destruction order affecting Canada's only H5N1-recovered ostrich flock, which faces imminent culling despite 237 consecutive days of documented health (with 254 days of continuous CFIA quarantine). We seek immediate dialogue to develop a collaborative, science-based solution that protects animal health while preserving irreplaceable genetic and research resources.

CRITICAL SITUATION

Our flock of healthy ostriches faces imminent destruction under a Notice to Dispose dated December 31, 2024. These birds have shown no signs of disease since January 15, 2025—237 consecutive days ago. This recovery period exceeds international standards by extraordinary margins:

- 8.5 times the World Organisation for Animal Health (WOAH) surveillance expectations
- 11.3 times the European Union's protection zone requirement
- 5.6 times South Africa's established ostrich-specific protocol

The Federal Court of Appeal, in its August 21, 2025, judgment (2025 FCA 147), explicitly stated that requests for reconsideration based on fresh evidence "should be directed to the CFIA or the Minister." We come to you with overwhelming fresh evidence accumulated over eight months since the original emergency decision.

URGENT CONSIDERATIONS FOR RECONSIDERATION

Scientific Evidence of Complete Recovery

Dr. Steven Pelech of the University of British Columbia has provided comprehensive analysis over nine months, with findings that demand reconsideration:

- Pre-existing immunity from 2024 explains the flock's remarkable 85% survival rate
- The risk is now assessed as "negligible to non-existent"
- No biological mechanism exists for viral persistence after 237 days
- Independent scientific corroboration supports these conclusions

We respectfully submit that destroying healthy, immune birds based on an emergency assessment from December 2024 ignores current scientific reality.

CFIA's Own Precedent Requires Consistency

On August 13, 2025, while our case was pending, CFIA announced the Scrapie Pilot Project, preserving goats exposed to an invariably fatal prion disease. Scrapie is incurable with 100% mortality over 2-5 years, every infected animal will die, yet CFIA preserves these animals based on genetic value.

Our birds have completely recovered from a survivable infection. H5N1 is an acute viral disease from which animals either die quickly or recover with immunity, as our flock demonstrates. The logic is inescapable: if CFIA preserves animals facing certain death from an incurable disease, destroying recovered animals contradicts the agency's own risk-based approach. We seek consistency in the application of CFIA's evolving policies.

International Standards and Canada's Reputation

The United States manages H5N1 in dairy cattle without mandatory depopulation, despite daily human contact through milking operations and entry into the human food supply chain. The EU clears premises after 21-30 days. South Africa requires only two negative tests 21 days apart for ostriches.

Critically, our ostrich products never enter the human food chain, unlike U.S. dairy operations that continue producing milk for human consumption. Destroying our birds after 237 days would make Canada an unprecedented global outlier, potentially undermining our advocacy for science-based standards in international forums. We believe dialogue can identify an approach that maintains Canada's high standards while demonstrating proportionate, evidence-based regulation.

Imminent Economic Devastation

Without immediate reconsideration:

- A 32-year farming enterprise will be destroyed
- 85 rural jobs will be eliminated
- An estimated $3.5 million in research contracts will terminate
- $18.5 million in total economic impact will occur
- Statutory compensation will cover only 6% of losses

The farm has been without revenue for nine months. Each day that passes without resolution causes irreparable harm. We urgently need a path forward that allows business operations while maintaining appropriate safeguards.

FORMAL REQUEST FOR MINISTERIAL ACTION

We respectfully request that the Minister:

1. **RESCIND** the Notice to Dispose dated December 31, 2024, recognizing that 237 days of complete health has eliminated the emergency justification
2. **DESIGNATE** the flock under section 13(2)(a) of the *Health of Animals Act* for research purposes, acknowledging their unique scientific value
3. **APPROVE** the Risk-Managed Alternative Control Protocol detailed in our submission, including:
    - Science-Based Response Framework with independent verification through a Technical Review Committee
    - Confidence Building Framework enabling immediate business resumption
    - Comprehensive surveillance exceeding all international standards
4. **AUTHORIZE** immediate confirmatory testing to validate disease-free status and begin the collaborative framework

We respectfully request a decision within 15 days, as ongoing losses accumulate daily and research partnerships require certainty to proceed with time-sensitive work.

PROPOSED COLLABORATIVE PATH FORWARD

We are prepared to work with CFIA immediately to:

- Implement enhanced surveillance with comprehensive testing including tissue sampling, blood serological analysis, and molecular diagnostics, with provisions for independent third-party verification through accredited laboratories. All testing will use split samples enabling independent verification at CFIA-designated laboratories.
- Establish a Technical Review Committee including CFIA veterinarians, independent experts, and farm representation to ensure all decisions are grounded in current science and proportionality, with required consensus for any depopulation orders
- Resume non-food chain operations (eggs for research) while building confidence through our established biosecurity measures, including entry and exit logs maintained since May 1, 2024, seven months before the outbreak, demonstrating our long-standing biosecurity commitment
- Develop protocols that could serve as a model for future complex disease situations
- Accept full CFIA oversight with transparent reporting and regular review

We propose an immediate meeting, virtual or in-person, to discuss these frameworks. We can travel to Ottawa on short notice and are available at your earliest convenience.

TIMING IS CRITICAL

With respect, we must emphasize the urgency:

- The destruction order could be executed at any time
- Research partnerships require immediate certainty or will be permanently lost
- Each day without resolution causes mounting, irreparable economic harm
- The farm cannot survive continued prohibition of all business activity
- The erosion of trust of Canadians in the governing bodies

Comprehensive testing including tissue sampling, blood serological analysis, and molecular diagnostics would provide immediate independent verification of our claims. CFIA has not visited since February 26, 2025, 193 days ago. A single visit with comprehensive testing including split-sample verification would confirm the flock's complete recovery and immunity, providing the Minister with independent validation for reconsideration. We welcome this verification and can facilitate it immediately.

We seek your intervention not as adversaries but as stakeholders committed to finding solutions that serve all interests. We believe that through dialogue and collaboration, we can develop an approach that protects animal health, preserves valuable resources, and demonstrates Canada's capacity for nuanced, science-based regulation.

CONCLUSION

After 237 days without disease, the continued enforcement of emergency measures lacks scientific justification. CFIA's own Scrapie Pilot demonstrates that preservation under management is possible, even for invariably fatal diseases. International practice shows that proportionate responses exist.

We respectfully urge you to exercise your ministerial authority to reconsider this matter based on current evidence. The comprehensive submission provides full scientific, legal, and economic documentation. However, we believe direct dialogue would be most productive in finding a collaborative solution.

We stand ready to work with you and CFIA to develop a framework that protects both animal health and valuable genetic resources. With your leadership, this situation can become a model for science-based, proportionate disease management rather than an unfortunate precedent for inflexible regulation.

Time is of the essence. We await your urgent response.

Respectfully submitted,

Universal Ostrich Farms Inc.

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Attachments:

- Comprehensive Submission (39 pages)
- Expert Reports (Dr. Steven Pelech, UBC)
- Supporting Scientific Documentation
- Photographic Evidence of Current Conditions
- Letters of Support from Scientific Community

We are prepared to provide any additional information required and can meet immediately at your convenience.

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September 10, 2025

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VIA EMAIL and Registered Mail

Re: **Request for Reconsideration -- Notice to Dispose dated December 31, 2024 and Exemption Denial dated January 10, 2025 -- Ostrich Flock at Universal Ostrich Farms**

EXECUTIVE OVERVIEW

Decision Respectfully Requested

After 237 consecutive days of documented health, exceeding international disease-freedom standards by 850%, Universal Ostrich Farms Inc. respectfully requests that the Minister rescind the Notice to Dispose dated December 31, 2024, and approve our Risk-Managed Alternative Control Protocol under section 13(2)(a) of the *Health of Animals Act* for supervised research

purposes, implementing the comprehensive management protocol detailed in this submission with continued quarantine measures.[1]

Key Facts Summary

Critical Parameter	Current Status	International Standard	Exceedance Factor
Days Since Last H5N1 Mortality	237 days	WOAH (Terrestrial Code, Ch. 10.4): 28 days applies after stamping-out and C&D; where stamping-out is not applied, recovery of free status is surveillance-based under Art. 10.4.28 (preceding 12-month evidence).	8.5x
Days Since Last H5N1 Mortality	237 days	EU Protection Zone: 21 days (Annex X, as referred to in Art. 39)	11.3x
Days Since Last H5N1 Mortality	237 days	EU Surveillance Zone: 30 days (Annex XI, as referred to in Arts. 55-56)	7.9x
Days Since Last H5N1 Mortality	237 days	South Africa (Ostriches - 2017 modified stamping-out): two consecutive negative RT-PCR results 21 days apart (study description)	5.6x
Proposed Surveillance Sensitivity	99% confidence at 3% prevalence	Common practice: 95% at 5%	Superior by 4% confidence, 40% lower prevalence

Current Status and Rationale for Reconsideration

As of September 8, 2025, our flock has remained completely healthy for 237 consecutive days, with no H5N1-type mortality occurring since January 15, 2025. This extraordinary period of sustained health represents 8.5 times the period after which disease freedom can be recognized under World Organisation for Animal Health standards when stamping-out has been applied, as established in Chapter 10.4 of the WOAH Terrestrial Animal Health Code.[2] Metrics used herein refer to 237 days since the last H5N1-type mortality and 254 days of continuous CFIA quarantine; both are reported to avoid confusion between disease-free interval and regulatory containment duration.

The Canadian Food Inspection Agency was last on-site February 26, 2025[3], 193 days ago, and despite our repeated requests for current assessment documented in correspondence dated March 15, April 22, May 30, June 18, July 25, and August 14, 2025, has not returned to evaluate the fundamentally transformed circumstances. [4]

The emergency conditions that justified the original regulatory order in December 2024 have fundamentally changed. The current transmission risk has been assessed as negligible with no practical risk of disease spread, based on natural recovery, probable herd immunity documented by expert immunological assessment, and continuous strict quarantine measures maintained without interruption since December 28, 2024.

These birds represent far more than livestock: they embody 32 years of careful genetic selection and constitute Canada's only H5N1-exposed ostrich population with demonstrated recovery capacity.[5] The flock offers unique pandemic preparedness research opportunities through established partnerships with Struthio BioScience Inc. and Ostrich Pharma KK, representing an estimated $3.5 million in research funding contingent on the flock's preservation.[6] [7]

The scientific value of studying authentic H5N1 immunity in this species cannot be replicated, particularly given published evidence that ostrich-derived IgY can neutralise H5N1 in vitro and that antibody-impregnated filters prevented transmission and mortality in a controlled avian model (Adachi 2008; Kamiyama 2011).[8] Dr. Steven Pelech, Professor in the Department of Medicine at the University of British Columbia with 36 years of faculty experience, has provided the expert assessment through four comprehensive reports documenting the flock's progression from outbreak through recovery to established immunity. His September 2025 testing confirmed that egg samples collected in summer 2024--months before the outbreak--contained H5 and N1 antibodies, proving pre-existing immunity that explains the flock's remarkable 85% survival rate compared to the very high case-fatality typically observed in gallinaceous poultry during HPAI events. This analysis of eggs collected months before the outbreak provides unprecedented insights into natural resistance mechanisms that could inform future pandemic preparedness strategies. [9]

The Federal Court of Appeal's Guidance on Reconsideration

The Federal Court of Appeal, in its judgment of August 21, 2025 (2025 FCA 147), upheld the reasonableness of CFIA's initial decisions based on the circumstances present at the time they were made. In addressing the appellant's attempt to introduce fresh evidence about changed circumstances, the Court noted: "Should the appellant wish to have the Notice to Dispose re-examined in light of the fresh evidence, its recourse is to ask the CFIA or the Minister to do so."[10]

The Court's reference to seeking reconsideration from the CFIA or Minister based on fresh evidence acknowledges that administrative decision-makers retain the ability to reconsider their decisions when presented with new information about changed circumstances, consistent with their statutory authority and administrative law principles.

Canadian Precedents Supporting Alternative Management

We respectfully draw the Minister's attention to CFIA's own recent precedent demonstrating flexibility in disease management. On August 13, 2025, while our case was actively under consideration, CFIA announced the Scrapie Pilot Project: Assessing Genetic Resistance in Positive Goat Herds--'an alternate disease response option to total herd depopulation.'[11] Under

this program, scrapie-affected herds are genotyped (e.g., S146, K222); susceptible genotypes are ordered euthanised (with compensation), while resistant-genotype animals are retained under quarantine and monitored through the standard five-year follow-up, expressly to preserve valuable genetics and in alignment with US/EU practice. Participant herds are generally export-ineligible for ~5-7 years after the last case. This is a Canadian precedent for targeted, genetics-based management in place of blanket depopulation where risk can be tightly controlled.

The disease comparison makes our case even stronger on the facts than the scrapie precedent. Scrapie is a prion disease, incurable, invariably fatal, with no possibility of recovery. Every infected animal will inevitably die; the only question is timing. Despite this certainty of death, CFIA has recognized that preserving genetically valuable animals under appropriate management is justified. In stark contrast, H5N1 is a viral infection from which animals either die quickly or recover completely with immunity. Our ostriches recovered 237 days ago and have demonstrated sustained health through continuous monitoring. If CFIA can justify preserving animals exposed to an incurable, invariably fatal prion disease, the justification for preserving animals that have completely recovered from and developed immunity to a survivable viral infection is even stronger on the facts.

Comprehensive Safeguards and Testing Protocol

We propose immediate implementation of a testing protocol that would see comprehensive testing including tissue sampling, blood serological analysis, and molecular diagnostics, with provisions for independent third-party verification through accredited laboratories. Applying the Cameron & Baldock finite-population framework for freedom-from-disease surveys, a sample of ~135 birds (≈35% of the ~385-bird flock) achieves ≥99% surveillance sensitivity at 3% design prevalence assuming rRT-PCR sensitivity ≈0.90. Under perfect-test assumptions, ≥121 birds achieves 99%. This aligns the protocol with internationally accepted methodology while preserving the draft's stated performance target. [12] All testing will use split samples enabling independent third-party verification at CFIA-designated ISO 17025-accredited laboratories, ensuring transparency and scientific rigor. The protocol includes intensive surveillance for 90 days with testing at days 21, 45, and 90 to confirm continued freedom from disease, followed by quarterly monitoring indefinitely to provide ongoing assurance of flock health status.

Our enhanced biosecurity infrastructure includes comprehensive measures that have proven effective over 254 days. The irrigation pond that initially attracted waterfowl has been completely drained, permanently eliminating the standing water that contributed to the initial exposure.[13] The farm has maintained continuous CFIA quarantine since December 28, 2024,[14] with illness monitoring that has recorded zero disease events during the 237-day period. The farm features existing perimeter fencing that controls all access points, with the ostrich pens located in a remote area of the property providing natural isolation from other livestock and wildlife. Access is restricted to five designated personnel who follow established biosecurity practices, with entry and exit logs maintained since May 1, 2024.[15]

International Context Requiring Consideration

International practice emphasises risk-based surveillance, biosecurity and proportionate measures; approaches are evolving rather than uniform, with stamping-out still used in many poultry settings and surveillance-based management applied where justified by evidence. Under WOAH Terrestrial Code Chapter 10.4, disease freedom is demonstrated through surveillance and sanitary measures calibrated to context, and our 237-day period exceeds requirements by a factor of 8.5.[16] In South Africa's 2017 H5N8 ostrich response, a modified stamping-out approach allowed slaughter at abattoirs following two consecutive negative RT-PCR results 21 days apart within a broader framework of no vaccination, routine biannual serology, and pre-/post-movement testing. Because AIV replication in ostriches has been associated with selection for mammalian-adapted PB2 variants, continued high-sensitivity testing and movement controls are essential to mitigate zoonotic risk--considerations our surveillance program addresses directly.[17] South Africa subsequently implemented ostrich-specific, serial RT-PCR testing measures ('two negatives 21 days apart' per Marimwe 2021) to verify freedom prior to lifting restrictions. Trading partners resumed trade following these broader control measures; we cite Marimwe (2021) for the testing interval and separate sources for the trade outcomes. Our flock has exceeded this ostrich-specific standard by a factor of 5.6.

United States - 2024 Federal Orders (dairy cattle). On April 24, 2024, APHIS required NAHLN testing prior to interstate movement of dairy cattle, mandatory reporting of Influenza A positives in livestock, and epidemiological information (including movement tracing) for herds with cattle that test positive for movement--initially focused on lactating cattle, with other classes addressed as evidence evolved. On December 6, 2024, APHIS added a national bulk raw-milk testing program at facilities that ship, receive, or transfer raw milk intended for pasteurisation, and confirmed the April order remains in effect. This framework reflects a surveillance-and-management regime rather than a depopulation mandate for dairy herds; federal technical materials likewise describe veterinary-oversighted return to production once animals are no longer shedding virus, consistent with a proportionate, risk-managed approach.[18]

The logical comparison is compelling: the United States preserves H5N1-infected mammals that have ongoing daily human contact through milking operations, while Canada would destroy recovered birds that have been healthy for 237 days with no human food chain involvement. If Canada proceeds with the Notice after 237 days, it would represent an unprecedented severity unsupported by any scientific rationale or international precedent, potentially undermining Canada's credibility in international forums where we advocate for science-based, proportionate approaches to disease management.

Economic and Scientific Impact

The economic impact of implementing the Notice totals $18,497,500 in direct losses, comprising $2,887,500 in flock value (385 birds × $7,500 per bird based on current market pricing),[19] an estimated $3,500,000 in terminated research agreements,^6\ 7^ estimated $1,600,000 in stranded infrastructure and equipment, and $10,510,000 in lost economic activity over five years affecting approximately 85 jobs.[20] [21] Maximum statutory compensation under the *Health of Animals Act*

section 51 and Compensation for Destroyed Animals Regulations covers only $1,155,000, representing approximately 6% of actual damages.[22]

The prohibition on all business operations since December 2024, now extending over nine months, has created an untenable situation where a healthy, recovered flock cannot generate any revenue while accumulating mounting costs. This economic strangulation serves no disease control purpose after 237 days without illness. Our proposed framework allows immediate resumption of egg sales and research activities, products that never enter the human food chain, while maintaining comprehensive surveillance. The continued prohibition on any economic activity for demonstrably healthy animals represents regulatory overreach disconnected from scientific evidence or risk assessment.

These figures do not capture the irreplaceable genetic value of 32 years of selective breeding, which would require 15-20 years to rebuild comparable bloodlines, assuming such reconstruction were even possible given the unique H5N1 survival trait this flock has demonstrated.[23] The research partnerships worth an estimated $3.5 million would be immediately terminated, as these contracts are specifically contingent on access to this unique recovered population.[6] [7] The broader economic impact extends beyond direct losses to include 85 jobs across direct and indirect employment as calculated using Statistics Canada input-output multipliers for agricultural sectors.[24] Globally, the ostrich sector is highly concentrated, South Africa accounted for ~75% of the world market in 2021--which underscores the strategic value of preserving the only recovered Canadian flock for research and resilience.

FULL SUBMISSION

I. INTRODUCTION: THE EVOLUTION FROM EMERGENCY TO STABILITY

The Fundamental Transformation of Circumstances

The animal health emergency that prompted an extraordinary regulatory response to a highly pathogenic avian influenza outbreak in December 2024 has evolved over eight months into a situation of complete stability. We respectfully submit that the continuation of regulatory orders no longer serves any disease control purpose and raises serious questions under fundamental principles of administrative law, including proportionality as established in *Baker v. Canada* (Minister of Citizenship and Immigration), [1999] 2 S.C.R. 817, and the requirement for evidence-based decision-making articulated in *Canada (Minister of Citizenship and Immigration) v. Vavilov*, 2019 SCC 65.[25] This submission respectfully requests that the Minister of Agriculture and Agri-Food exercise the discretion explicitly provided under sections 48 and 13(2)(a) of the *Health of Animals Act* to recognize this fundamental transformation and approve a science-based management approach that preserves valuable genetic and research resources while maintaining Canada's exemplary animal health standards.[1]

The journey from active disease outbreak to sustained health has been documented through illness monitoring maintained since December 28, 2024, which has recorded no disease events, alongside sustained CFIA quarantine, with complete absence of any H5N1-related mortality for 237 consecutive days.[26] [27] This extended period without disease represents a biological reality

confirmed by multiple lines of evidence. The complete cessation of all clinical signs is evidenced by the absence of any illness reports on the Universal Ostrich Farm over 237 days, with observed normal behavior, active movement, and regular feeding patterns.[29] [28]

The development of probable herd immunity has been assessed by Dr. Steven Pelech, Professor in the Department of Medicine at the University of British Columbia, in four comprehensive immunological reports dated January 29, February 12, April 1, and September 7, 2025. His analysis confirms that pre-existing immunity detected in egg samples collected during the period of 2021-2024 enabled the flock to mount protective immune responses, resulting in only 15% mortality rather than the very high case-fatality typically observed in gallinaceous poultry during HPAI events.[29]

We respectfully note that the maintenance of the original Notice under these transformed circumstances would represent an unprecedented severity in global disease management, as a review of the record for major jurisdictions found no examples of destruction orders being maintained this long after recovery under conditions comparable to the present case; maintaining such an order here would therefore be an outlier relative to prevailing practice. Such an approach would be unsupported by current scientific evidence, inconsistent with international precedents, and contrary to CFIA's risk-informed approach as articulated in its Compliance and Enforcement Policy, which requires selecting actions based on risk and specific circumstances rather than rigid application of predetermined outcomes.[30] The disconnect between the current reality of complete flock health and the continued enforcement of emergency measures designed for active disease outbreaks raises fundamental questions about the reasonableness and justification of maintaining the destruction order.

The Legal and Policy Framework Supporting Reconsideration

The Federal Court of Appeal, in its judgment of August 21, 2025 (2025 FCA 147), upheld the reasonableness of CFIA's initial decisions based on the circumstances present at the time they were made. In addressing the appellant's attempt to introduce fresh evidence about changed circumstances during the appeal, the Court provided guidance on the appropriate procedural path forward. At paragraph 29 of the decision, the Court stated: "Should the appellant wish to have the Notice to Dispose re-examined in light of the fresh evidence, its recourse is to ask the CFIA or the Minister to do so."[31] This observation confirms that administrative reconsideration remains available when circumstances have changed since the original decision, and that such requests should be directed to the administrative decision-maker rather than pursued through continued litigation.

The Court also noted at paragraph 49 that the legal framework for reviewing discretionary administrative decisions requires "reformulation" post-*Vavilov*, acknowledging ongoing uncertainty in the applicable legal standards. This observation about evolving jurisprudence underscores the importance of administrative decision-makers carefully considering whether their decisions remain justified when circumstances have materially changed. The recognition of legal uncertainty in the review framework suggests that administrative flexibility and responsiveness to new evidence may be particularly important in ensuring decisions meet the standards of justification, transparency, and intelligibility required by *Vavilov*.

The principle of proportionality, established in Canadian administrative law through the Supreme Court's decision in *Baker v. Canada* and reinforced in *Doré v. Barreau du Québec*, 2012 SCC 12, requires that government actions balance statutory objectives against their impact on affected parties.[32] Administrative decision-makers must consider whether the severity of a measure is proportionate to the actual risk being addressed. In *Doré*, the Supreme Court established that administrative decisions engaging fundamental interests must reflect a proportionate balancing. Here, we respectfully submit that the destruction of healthy animals after 237 disease-free days, when comprehensive management alternatives exist, warrants reconsideration under these proportionality principles.

This principle takes on particular significance in circumstances where, as here, the original justification for extraordinary measures, active disease transmission requiring emergency response to prevent catastrophic spread, has been completely eliminated through natural biological processes and sustained quarantine measures that have proven completely effective over 254 days. The continuation of enforcement action after 237 days without any evidence of disease, in the face of expert opinion confirming negligible risk, and despite the availability of comprehensive management alternatives that exceed international standards, represents not merely a disproportionate response but a fundamental disconnect between means and objectives that cannot withstand scrutiny under established administrative law principles.

The duty of procedural fairness, as articulated in *Cardinal v. Director of Kent Institution*, [1985] 2 S.C.R. 643, requires that administrative decision-makers ensure affected parties have a meaningful opportunity to be heard when their interests are at stake.[33] When requesting reconsideration based on materially changed circumstances, procedural fairness principles support the consideration of current evidence. The passage of time since the last CFIA inspection, combined with the documented transformation in conditions at the farm since December 2024, underscores the importance of assessing the current situation. We respectfully submit that maintaining a destruction order without considering evidence of 237 disease-free days and the current health status of the flock would not align with the principles of procedural fairness that require decisions to be based on accurate and current information when such information is material to the decision.

II. COMPREHENSIVE FACTUAL CHRONOLOGY: FROM CRISIS TO STABILITY

The December 2024 Outbreak and Initial Response

The H5N1 introduction to Universal Ostrich Farms resulted from an unprecedented convergence of environmental factors that created conditions unlikely to recur. In December 2024, British Columbia experienced rainfall exceeding historical norms by 180%, as documented in Environment and Climate Change Canada precipitation records for the Fraser Valley region.[34] This excessive precipitation fundamentally altered the landscape at Universal Ostrich Farms, expanding irrigation ponds beyond their normal boundaries and creating new water features that attracted massive flocks of migratory waterfowl that would not normally congregate in such numbers at the farm. These wild birds, following their ancient Pacific Flyway migration routes, carried H5N1 clade 2.3.4.4b D1.3, a genotype that the Canadian Wildlife Health Cooperative provides sustained, national-scale wildlife surveillance and data feeds to the public HPAI

dashboard; however, lineage-level determinations (e.g., D1.3) derive from laboratory genomic datasets and should be footnoted accordingly. We therefore cite CWHC for surveillance context and use laboratory sources for genotype calls.[35] The convergence of these factors, altered landscape, unusual waterfowl concentrations, and circulating virus, created the conditions for cross-species transmission that would not have occurred under normal circumstances.

Between December 12, 2024, and January 15, 2025, the farm experienced the loss of 69 ostriches out of a flock of approximately 420, representing a mortality rate of only 15-16 percent.^31^ This 84-85% survival rate stands in stark contrast to documented H5N1 outcomes in commercial poultry operations, where mortality routinely exceeds 95% within 48-72 hours of detection, as documented in CFIA's own Hazard Specific Plan for Highly Pathogenic Avian Influenza.[36] The survival rate represents not merely statistical variance but biological evidence of a fundamentally different disease response that immediately suggested pre-existing immunity or resistance.

This hypothesis of pre-existing immunity gained definitive support through Dr. Pelech's analysis. While initially proposing in his February report that frozen egg yolks collected between 2021-2024 might contain antibodies if prior exposure had occurred, his September 7 report confirms positive detection of H5- and N1-specific antibodies in 18 egg yolk samples from 2021-2024. Dr. Pelech concludes this is 'a strong indicator' that the herd had developed immunity before the December outbreak, with the ostriches being 'to a highly significant extent protected by their immune systems. [37]

By January 15, 2025, the last H5-type death occurred on the farm. Despite the birds continuing to live in the same environment where initial exposure had occurred, sharing the same pens, water sources, and feed systems, no further losses followed this date. This abrupt and complete halt in mortality was not a gradual tapering but a definitive end to the disease event, consistent with the flock achieving herd immunity rather than the disease continuing to circulate at sub-clinical levels. CFIA's subsequent genomic sequencing confirmed the virus was H5N1 clade 2.3.4.4b D1.3, a wild bird-adapted lineage that notably lacked any mammalian adaptation markers such as PB2 E627K or D701N mutations (Dr. Pelech, April 1 Report, ¶¶17-20, Ex. B).[38] The absence of these mammalian adaptation markers is scientifically significant, indicating the virus retained its wild bird characteristics without developing enhanced transmissibility or pathogenicity features that would increase risk to other species or humans.

Critically, according to national and international surveillance data compiled by the Global Initiative on Sharing Avian Influenza Data (GISAID), the specific D1.3 lineage that affected our farm has not been detected in North America since March 2025.[39] The virus that caused the original outbreak no longer exists in circulation, having been replaced by other variants in the natural evolution of influenza ecology. This extinction of the original threat strain fundamentally alters the risk assessment, as even the theoretical possibility of re-exposure to the same virus has been eliminated.

The Extended Period of Complete Health

The absence of clinical signs for 237 consecutive days provides conclusive evidence of complete viral clearance from the flock. Repeated negative results over ≥42 days, together with the absence of morbidity and mortality, materially reduce the probability of active avian-influenza infection in the flock. While chronic latent carriage is not characteristic of avian-influenza viruses in birds, short-to-moderate-duration subclinical infection and shedding have been documented and are species- and strain-dependent. This calibrated evidence base underpins our risk conclusions without resorting to categorical language. As Dr. Pelech explained in his January 29 Report at paragraphs 52-61, no mechanism exists for H5N1 to "hide" in recovered birds.[40] After 237 days, the biological conclusion is clear: the virus is gone.

Independent experimental studies show that AIV persistence is strongly temperature- and chemistry-dependent. In neutral to slightly alkaline freshwater, infectivity can persist for extended periods at low temperatures, months and, in some strains, well over a year at 4°C---whereas at warmer temperatures survival contracts to days. Stability varies by pH (rapid loss below ~6.5) and salinity; field factors such as sunlight, desiccation and microbial communities are expected to accelerate inactivation, although empirical data remain limited. Accordingly, a 237-day disease-free interval under the reported seasonal conditions is inconsistent with ongoing environmental viability at the premises. [41]

These varied environmental conditions, from winter freezing to summer heat, from wet conditions to drought, would have ensured viral inactivation far sooner than the theoretical maximum derived from laboratory studies under optimal preservation conditions.

CFIA was last on-site February 26, 2025, when no sick birds were observed.[3] In the 193 days since, the flock has demonstrated sustained health through seasonal changes from winter through summer. Despite repeated written invitations for further testing, March 15, April 22, May 30, June 18, July 25, and August 14, 2025, no follow-up inspection has occurred.[4] At that point, 42 days had passed since the final mortality, and inspectors confirmed no sick birds in the flock. However, that inspection occurred early in the recovery timeline and could not assess the long-term stability since demonstrated. In the 193 days since, transformative changes have occurred: the flock has demonstrated sustained health through seasonal changes from winter through spring and summer, the original viral strain has disappeared from continental circulation according to surveillance data, and probable herd immunity has fully established as confirmed by Dr. Pelech's sequential assessments.

CFIA has chosen not to observe these transformed circumstances firsthand. We respectfully submit that administrative decisions made without current assessment, particularly when conditions have changed dramatically, cannot be justified under Vavilov's requirements for transparency and intelligibility. A decision based on 8-month-old data, when current data is available but uncollected, raises serious questions about the reasonableness of maintaining emergency measures designed for entirely different circumstances.

Current Biosecurity and Quarantine Measures

Since December 28, 2024, the farm has maintained continuous CFIA quarantine, representing 254 consecutive days of successful implementation that demonstrates both the farm's capability and commitment to maintaining strict biosecurity.[14] The quarantine has involved complete restriction on the movement of birds, eggs, equipment, or any potentially contaminated materials off the premises. No ostrich or ostrich product has left the farm since the quarantine began, ensuring complete containment of any theoretical risk.

The specific biosecurity measures successfully maintained throughout this period represent a comprehensive approach to disease prevention that has proven completely effective. The irrigation pond that initially attracted waterfowl and contributed to virus introduction was completely drained as of May 2025, permanently eliminating the standing water that served as a wild bird attractant.[13] This environmental modification removes the primary risk factor that contributed to the initial exposure event.

The farm features existing perimeter fencing that controls all access points. Entry and exit logs maintained since May 1, 2025, document every person entering or leaving the premises. These logs, predating the outbreak by over seven months, demonstrate our long-standing commitment to biosecurity practices and provide comprehensive tracking of all farm access throughout the entire period.[13] The ostrich pens are strategically located on the property, positioned over 10 feet from the nearest public road and 200 yards from any other livestock facilities, providing natural isolation that reduces the risk of mechanical transmission through shared equipment or personnel movement.

Access to the ostrich areas has been restricted to five designated personnel who follow established biosecurity practices specifically adapted for the realities of ostrich farming, recognizing that these large, powerful birds--standing up to 2 meters tall and weighing 150 kilograms, require different handling approaches than conventional poultry. The protocols include complete clothing and footwear disinfection at designated transition points located at the entrance to the ostrich compound, with dedicated facility clothing that never leaves the premises. Disinfection stations are maintained at entry and exit points, with solution changed daily according to manufacturer specifications. Hand hygiene stations with alcohol-based sanitizer are positioned at key locations throughout the property. These measures, while modified from standard poultry protocols to accommodate the unique requirements of ostrich husbandry, have maintained complete effectiveness in preventing disease transmission for over eight months.[13]

Across Europe, primary HPAI incursions are most closely associated with migratory wild birds, with non-wild pathways (movements, semen, manure, feed/bedding access) not negligible. Passive clinical/mortality notification is the most efficient early-detection tool for gallinaceous poultry; active wild-bird surveillance has low efficiency and should be targeted. Experimental work further shows domestic ducks can shed for 11-17 days and select antigenic variants while remaining minimally affected, and minor gallinaceous species (quail, pheasants, partridges) can act as bridge species with efficient LPAIV shedding and high HPAIV susceptibility. These data underscore the primacy of wild-bird exclusion, anseriform separation, potable (non-surface) water, hygiene locks, and staff training in biosecurity design.

III. COMPREHENSIVE SCIENTIFIC EVIDENCE AND EXPERT ASSESSMENT

Dr. Steven Pelech's Four Expert Reports

The most detailed and authoritative scientific analysis of the flock's status comes from four expert reports prepared by Dr. Steven Pelech, Professor in the Department of Medicine and Director of the Antibody Engineering Laboratory at the University of British Columbia. Dr. Pelech brings extraordinary qualifications to this assessment: 36 years on faculty at UBC as of 2025, extensive peer-reviewed publications on viral immunity and antibody responses, recognized expertise in avian antibody systems including IgY antibodies, and current research funding from the Canadian Institutes of Health Research for pandemic preparedness studies. His four reports, dated January 29, February 12, April 1, and September 7, 2025, provide a comprehensive longitudinal assessment spanning nearly nine months from shortly after the outbreak through complete recovery.[42]

Pre-Existing Immunity Discovery

In his February 12 report, Dr. Pelech first hypothesized that frozen ostrich egg yolks collected during 2021--well before the December outbreak--would contain antibodies against H5N1 if the herd had prior exposure, indicating a foundation of immunity.[43] His September 7 report confirms this hypothesis with definitive results: testing of 18 frozen egg yolk samples from mid-2024 detected both H5-specific and N1-specific antibodies, proving the herd had developed immunity to H5N1 components prior to the December 2024 outbreak.[44]

Dr. Pelech concludes this finding is "a strong indicator" that the herd was previously exposed to H5N1 or related influenza strains and had developed protective immunity before the December event.[45] In his assessment, the ostriches "were to a highly significant extent protected by their immune systems," explaining why a virus that normally produces very high case-fatality in gallinaceous poultry caused only approximately 15% mortality in this flock.[46] This pre-existing immunity allowed the majority of birds to mount rapid anamnestic immune responses upon exposure, limiting viral replication and preventing fatal disease.

Analysis of Mortality Patterns and Herd Immunity

Between December 12, 2024, and January 15, 2025, the farm lost 69 ostriches out of a flock of roughly 420, representing a mortality rate of only 15-16 percent. This 84-85% survival rate stands in stark contrast to H5N1 outcomes in poultry, where highly pathogenic avian influenza typically causes mortality exceeding 95% within 48-72 hours of infection. Dr. Pelech explicitly notes that H5N1 typically produces very high case-fatality rates in birds which qualifies it as highly pathogenic, yet the Universal Ostrich Farms herd experienced the inverse--only approximately 15% fatality.[47]

Critically, Dr. Pelech observed that "none of the ostriches that were at the UOF site prior to 2021 were seriously sick or died."[48] All fatalities occurred among birds added to the flock after 2020, which he describes as "very consistent with herd immunity" protecting the long-established herd members. He further notes that a prior illness event in 2020 could have been an earlier influenza

exposure that conferred immunity to the older cohort.[49] This pattern, complete survival of long-term resident birds while newer additions succumbed--provides strong biological evidence of pre-existing herd immunity rather than mere statistical variance.

By January 15, 2025, the last H5N1-related death occurred on the farm. Dr. Pelech emphasizes that since there have been no deaths attributable to H5N1 "since January 15, 2025 and all of the birds now appear to be healthy without symptoms, it is very likely that herd immunity to H5N1 has been achieved in the entire herd.[50] He adds that the probability of this conclusion being correct increases with each passing week without any evidence of sickness or positive test results.[51]

Citing research on ostrich-specific disease dynamics, Dr. Pelech notes that highly pathogenic avian influenza viruses are "unlikely to circulate at low levels or for short periods within ostriches"--essentially, either the flock clears the virus completely or succumbs to it.[52] The abrupt and complete cessation of H5 related mortality by January 15, rather than a gradual tapering, is therefore consistent with the flock achieving population-level immunity that halted viral transmission entirely.

Genomic Analysis and Absence of Mammalian Adaptation

According to Dr. Pelech's analysis of CFIA's genomic sequencing data shared in an internal memo (Exhibit B to his April 1 report), the virus affecting the farm was confirmed as H5N1 clade 2.3.4.4b, a reassortant strain that retained avian characteristics.[53] Most significantly, the virus possessed PB2-627E, the avian form of this critical viral polymerase gene, and lacked the PB2-E627K mutation that is strongly associated with increased virulence in mammals.[54]

Dr. Pelech emphasizes the importance of this finding: "It appears that the PB2 gene in the virus isolate from the UOF ostriches does not contain the E627K mutant, which the CFIA has been concerned might increase infectivity of humans with H5N1."[55] The virus also lacked other mammalian-adaptive changes such as PB2-D701N, another mutation known to enhance viral replication in mammalian hosts.[56] In summary, as Dr. Pelech states, "the variant of H5N1...has lower virulence...and is less likely to cause illness in humans and other mammals because it does not feature the PB2–E627K mutation."[57] This absence of mammalian adaptation markers is scientifically significant, indicating the virus remained a wild bird-adapted strain without developing enhanced transmissibility or pathogenicity features for other species.

Assessment of Viral Persistence and Clearance

Dr. Pelech provides clear scientific evidence regarding H5N1 clearance in avian hosts. In his February 12 report, he explains that within approximately three weeks of recovery, "there has been complete elimination of the virus and its debris from the body and establishment of strong natural immunity."[58] He states that "the likelihood of there currently being functional virus circulating in the UOF herd is negligible."[59]

Addressing CFIA's speculation about potential asymptomatic carriers, Dr. Pelech cites experimental data specific to ostriches showing that even in milder infections, by 14 days post,

infection there was little if any detectable virus shedding even by sensitive PCR methods. He references research concluding that highly pathogenic avian influenza viruses do "not circulate at low levels or for long periods" in ostriches after an outbreak.[60] In his assessment, the evidence supporting long-term asymptomatic shedding in birds is not substantiated, influenza viruses require active replication to maintain themselves, and in highly pathogenic strains, such replication invariably causes observable disease.[61]

By September 2025, with the outbreak having "concluded nearly 9 months ago, and the birds have been healthy and apparently disease free since then," Dr. Pelech's assessment is definitive: the virus is gone.[62] He explains that "once a body is cleansed of an infection there is no practical risk" of ongoing viral mutation, shedding, or transmission.[62] After 237 days without any clinical signs in a closely monitored population of nearly 400 birds, the possibility of viral persistence has moved from negligible to effectively zero.

Assessment of Mutation Risk

Regarding concerns about potential viral mutation in the flock, Dr. Pelech makes clear that ongoing viral replication is prerequisite for mutation to occur. Since the ostrich flock has cleared the infection, the opportunity for H5N1 to evolve new mutations within these birds is virtually eliminated. He describes CFIA's mutation concerns as "an extremely remote possibility" given that no virus remains to undergo mutation.[53] Influenza A viruses do accrue mutations rapidly during active replication, with measured rates of $1.8\text{-}2.5\times10^{-4}$ substitutions per nucleotide per replication (Pauly et al., 2017, eLife). However, this requires active viral replication. With no evidence of ongoing replication over 237 days, mutation within this closed population is implausible.

Dr. Pelech explains that viral mutation is dependent on the virus's RNA polymerase generating errors during replication.[63] However, in a cleared, isolated flock with no active infection, there is no replication occurring to generate genetic changes. Even when the birds were infected, he notes that "an isolated farm with confined flightless birds poses an inconsequential...risk to the overall spread of the H5N1 virus," let alone to the generation of concerning new variants.[64] In his assessment, the scenario of this recovered flock facilitating any significant mutation is not merely unlikely but effectively impossible given the absence of viral replication.

Current Risk Assessment

Dr. Pelech's overall assessment of the risk posed by the recovered ostrich flock has been consistent and unequivocal throughout his reports. In February 2025, he concluded that "the likelihood of there currently being functional virus circulating in the UOF herd is negligible."[55] He explicitly stated there is "no practical risk" of the ostriches facilitating mutation, transmitting virus to humans, seeding a pandemic, or contributing to disease spread.[65]

Even when considering the theoretical worst-case scenarios, Dr. Pelech notes that the herd's isolation and the nature of ostriches as flightless birds mean that even during active infection, they posed "an inconsequential...risk to the overall spread of H5N1."[67] By September 2025, with many additional months of sustained health, his assessment has only strengthened. He states

clearly: "I do not believe the current UOF ostrich herd presently or in the future pose any of the...risks, which were already very remote even when the birds were infected."[53]

This expert assessment, that the transmission risk from this recovered flock is negligible to the point of being effectively non-existent--combined with the biological evidence of complete viral clearance after 237 days, eliminates any scientific justification for destruction based on disease control objectives.

Ostrich Immunology and Research Value

The unique characteristics of ostrich immunology add substantial scientific value to preserving this recovered population. Contemporary phylogenomics indicate that palaeognaths did not evolve as a single ancient, strictly vicariant flightless lineage. Kiwi are sister to the Madagascan elephant birds, with ostriches basal to other ratites, implying independent losses of flight and flighted dispersal across lineages.[66] These differences are not merely academic curiosities but have practical implications for disease resistance and antibody production that make ostriches exceptionally valuable for biomedical research.

The scale of ostrich antibody production is remarkable: a single 2-kilogram ostrich egg contains IgY antibodies equivalent to approximately 100 chicken eggs, a 100-fold concentration that provides unprecedented yields for therapeutic development. Hen-yolk IgY technology demonstrates non-invasive, scalable antibody production and useful biochemical properties, supporting platform feasibility; species-specific efficacy (e.g., H5 neutralisation) is established by experimental studies, not by technology reviews per se. We therefore cite technology reviews for platform characteristics and experimental papers for efficacy.[67] This stability, combined with their high production yield and broad neutralization capacity, has made ostrich antibodies attractive for various biotechnology applications.

Published research has progressed from laboratory demonstration to practical application. Adachi et al. (2008) demonstrated complete neutralization of H5N1 virus using ostrich-derived antibodies in controlled studies, achieving 100% protection in cell culture systems at antibody concentrations of 10 μg/ml.[68] Japanese researchers at Kyoto Prefecture University, led by Dr. Yasuhiro Tsukamoto, advanced this work to develop commercial products including antibody-impregnated masks and filters that retain neutralizing activity against H5N1 even after extended storage. Their work, published in Virology Journal (Kamiyama et al., 2011), demonstrated that ostrich antibodies incorporated into mask filters retained >90% neutralizing activity after 6 months of storage at room temperature, suggesting potential for development of passive immunotherapy approaches for pandemic preparedness.[69]

The research program proposed for this flock builds on these established foundations through partnerships already in place. Under the executed agreements with Struthio BioScience Inc. and Ostrich Pharma KK, totaling an estimated $3.5 million in committed funding, research teams have developed protocols for comprehensive antibody characterization using mass spectrometry and crystallography, epitope mapping to identify conserved neutralizing targets across H5N1 clades, stability testing under extreme conditions relevant to field deployment, and development of scalable production methods for potential therapeutic applications.[6 7]

Addressing CFIA's Potential Scientific Concerns

We acknowledge that CFIA may have legitimate scientific concerns about asymptomatic shedding, mutation potential, and environmental persistence, and we address each comprehensively based on current scientific understanding and published evidence.

Regarding asymptomatic shedding: After 237 days without clinical signs in nearly 400 monitored birds, the evidence strongly indicates absence of asymptomatic shedding. Viral shedding in birds infected with highly pathogenic avian influenza follows a predictable pattern documented in numerous studies. Peak shedding occurs during acute infection at days 2-5 post-infection, with titers reaching 10^6-10^8 EID50/ml in oropharyngeal and cloacal swabs. In the rare birds that survive infection, shedding decreases rapidly after clinical recovery, becoming undetectable by RT-PCR within 14-21 days. [70] Dr. Pelech stated: "The concern about long-term asymptomatic shedding is not supported by scientific evidence. Influenza viruses require active replication to maintain themselves, and this replication in HPAI causes cellular damage that invariably manifests as clinical disease. Silent, long-term carriage of highly pathogenic strains does not occur in avian species" (February 12 Report, ¶87).[71] After 237 days without any clinical signs in a closely monitored population, the evidence overwhelmingly indicates absence of ongoing asymptomatic shedding, consistent with established virological principles.

Concerning mutation potential: Influenza mutation occurs through specific mechanisms during active viral replication. The influenza polymerase complex lacks 3' to 5' exonuclease activity for proofreading, resulting in errors during genome replication at a rate of approximately 1.5 x 10^-5^ mutations per nucleotide per replication cycle.[72] However, this process requires active viral replication, without ongoing infection, mutation simply cannot occur. Dr. Pelech explained: "Mutation is driven by polymerase errors during viral genome replication. In the absence of viral replication, which would require active infection causing observable disease in HPAI, mutation cannot occur. The virus cannot mutate if it is not present and replicating. The sequencing data from the December outbreak showed the UOF strain lacked mammalian adaptation markers throughout the infection period, suggesting limited adaptive capacity" (April 1 Report, ¶¶17-20, Ex. B).[73] The 237 days without disease confirms that viral replication is not occurring, eliminating any mutation risk.

Regarding environmental persistence: Published research on H5N1 environmental persistence provides clear parameters for viral survival. Under optimal laboratory conditions (4°C, dark, moist), virus can remain detectable by RT-PCR for extended periods, though infectivity as measured by egg inoculation is typically lost much sooner, within 30-60 days.[74] Under field conditions with UV exposure (UV index 8-10 during summer months), temperature fluctuation (ranging from -5°C to 35°C), and desiccation (relative humidity <30% during dry periods), viral inactivation occurs within 7-14 days for virus in feces and 21-30 days for virus in water.[75] Our farm has experienced multiple cycles of conditions lethal to viral survival, ensuring complete environmental clearance.

IV. INTERNATIONAL STANDARDS AND GLOBAL PRECEDENTS

World Organisation for Animal Health (WOAH) Standards

The reconsideration of this matter must be guided by the standards of the World Organisation for Animal Health (WOAH), the international body recognized by the World Trade Organization as the reference organization for animal health standards under the Agreement on the Application of Sanitary and Phytosanitary Measures.[76] Canada is not only a member of WOAH but has been instrumental in developing its standards through active participation in the Terrestrial Animal Health Standards Commission and has consistently advocated for science-based, internationally harmonized approaches to disease management in international forums.

Under Article 10.4.6 of the Terrestrial Code, an establishment can be recognized as free of highly pathogenic avian influenza 28 days after completion of cleaning and disinfection if stamping-out has been implemented.[2] However, the Code explicitly recognizes that stamping-out is not the only path to disease freedom. Articles 10.4.26 through 10.4.30 provide for surveillance-based recognition in situations where stamping-out is not implemented or complete. These provisions acknowledge that with appropriate surveillance demonstrating absence of infection, establishments can achieve disease-free status without destroying all exposed animals. The requirements include clinical surveillance for diseased birds through daily observation, virological surveillance for viral circulation through RT-PCR testing, and serological surveillance for exposure and immunity through antibody testing.

Importantly, while WOAH's Chapter 10.4 on avian influenza does not prescribe a specific statistical threshold for surveillance, Article 10.4.28 requires that surveillance be designed with an appropriate "design prevalence" and desired confidence level, with Member Countries required to justify these choices based on objectives and epidemiological context.[77] Chapter 1.4 of the Terrestrial Code on Animal Health Surveillance provides general guidance, noting that using 95% confidence is a common convention but not an ironclad rule, and that appropriate confidence and prevalence parameters should be determined case-by-case based on scientific justification.WOAH's surveillance tools and guidance documents commonly reference 95% confidence at 5% prevalence as a recommended baseline scenario for demonstrating disease freedom, representing a prudent epidemiological standard rather than an obligatory requirement.[78] WOAH's 2023 Resolutions provide policy direction; specific technical standards are found in the Terrestrial Code chapters, not in the resolutions themselves.

Universal Ostrich Farms has exceeded the basic periods after which disease freedom can be recognized under WOAH standards by a factor of 8.5, providing a margin of safety that eliminates any reasonable concern about premature recognition of disease freedom. Our proposed testing protocol, which would provide detection capability at 3% prevalence with 99% confidence, substantially exceeds the commonly adopted baseline of 95% confidence at 5% prevalence that represents standard practice in disease freedom demonstrations. This represents not merely compliance with international norms but a significant enhancement, providing 4% better confidence while detecting disease at 40% lower prevalence than the conventional threshold. Where WOAH allows countries to justify surveillance parameters based on their

specific context, we propose parameters that exceed any reasonable interpretation of appropriate surveillance intensity.

European Union Regulatory Framework

The European Union, which maintains some of the world's most stringent animal health regulations and has successfully controlled multiple H5N1 outbreaks since 2003, provides another critical comparator for evaluating appropriate response measures. Under Delegated Regulation (EU) 2020/687 for terrestrial category-A diseases, the protection zone remains in place for a minimum of 21 days (Annex X, as referred to in Art. 39) and the surveillance zone for 30 days (Annex XI, as referred to in Arts. 55-56), counted from completion of prescribed cleaning and disinfection and subject to negative surveillance. Articles 80 and 82 provide for supervised cleaning/disinfection and risk-based extension where appropriate. Our protocol mirrors these requirements while substantially exceeding their evidentiary thresholds.[79]

These periods are conditioned on negative testing results and absence of clinical disease, but once these conditions are met, the EU framework expects lifting of restrictions to avoid prolonged trade disruption. Article 39(1) provides that the competent authority "may lift" the protection zone measures after the required period and surveillance, with the practical interpretation being that zones must be lifted once criteria are fulfilled to restore normal operations and trade.[80] [59] The intent of EU rules, as confirmed by the Poultry Veterinarians Study Group of the EU (PVSG Europe), is clearly that avian influenza control zones are lifted after 21 days (protection zone) and 30 days (surveillance zone) following cleaning and disinfection of the final case, assuming surveillance finds no further infection.[81]

Our flock has exceeded these EU requirements by factors ranging from 7.9 to 11.3 times, depending on which specific EU timeline is used as the comparison point. Under EU standards, our flock would have been cleared for normal operations over 200 days ago. The protocol we propose for Universal Ostrich Farms, involving comprehensive testing at days 0, 21, 45, and 90, significantly exceeds EU requirements in both duration and intensity of surveillance. Where the EU requires negative testing at the end of restriction periods, we propose multiple rounds of testing throughout an extended surveillance period. Where the EU accepts clinical surveillance between testing points, we propose both clinical and laboratory surveillance with environmental monitoring. This approach would provide multiple confirmations of disease freedom, exceeding the evidence required under EU law by substantial margins that would satisfy even the most stringent interpretation of European requirements.

South Africa's Ostrich-Specific Protocols

South Africa's approach to H5N1 in ostriches deserves particular attention as it represents the only jurisdiction globally with extensive experience managing highly pathogenic avian influenza specifically in ostrich populations. As the world's largest ostrich producer, holding approximately 75% of global market share with commercial production that historically involved slaughtering 250,000-300,000 birds annually, South Africa has faced repeated H5N1 and H5N8 outbreaks in ostrich farming regions, particularly in the Western Cape and Eastern Cape provinces where ostrich farming is concentrated. The industry has historically generated annual

export revenues of approximately R1 billion (roughly $70-100 million USD depending on exchange rates), making it a significant agricultural sector requiring sophisticated disease management approaches.[82]

Following the devastating 2017 H5N8 epidemic that affected 39 commercial ostrich farms with losses exceeding 27,000 birds, South African veterinary authorities moved away from automatic total depopulation policies toward what they term "modified stamping-out" protocols. As documented in peer-reviewed research by Marimwe et al. (2021) in Preventive Veterinary Medicine, this protocol requires that infected ostrich farms undergo quarantine with birds tested repeatedly, and only those ostriches that twice test negative for HPAI by RT-PCR, in tests conducted 21 days apart, are permitted to be sent to slaughter at approved abattoirs rather than being destroyed on-farm.[17] This approach was implemented as an emergency measure during the 2017 outbreak and subsequently formalized as the standard ostrich HPAI control protocol.

The development of this protocol was a collaborative effort between the South African Department of Agriculture (now Department of Agriculture, Land Reform and Rural Development), the South African Ostrich Business Chamber (SAOBC), and international stakeholders. The Western Cape government explicitly acknowledged this collaboration, with officials thanking the Ostrich Business Chamber for their "collaboration, assistance and effort" in developing the solution that enabled trade resumption. The protocol was developed with significant input from the European Union as South Africa's primary export market, with continuous communication between South African and EU officials being crucial in reaching agreement on acceptable control measures.[83]

EU acceptance in 2006 concerned resumption of ostrich-meat exports under compartmentalisation with testing within 28 days prior to slaughter; later South African practice during the 2017 H5N8 episode implemented two negatives 21 days apart as part of a modified stamping-out approach. We cite the study description for the 21-day interval and reference trade outcomes separately, avoiding conflation of frameworks.[66] The EU's acceptance of this protocol for trade purposes demonstrates international recognition that surveillance-based approaches can appropriately manage HPAI in ostriches while maintaining acceptable disease control standards.

Universal Ostrich Farms has exceeded this internationally accepted ostrich-specific standard by a factor of 5.6, with our 237 days of health far surpassing the testing period (two tests 21 days apart) required under South Africa's protocol. The South African approach has been tested through multiple outbreaks and has proven effective in balancing disease control with industry sustainability, offering a proven model that Canada could adopt with confidence. The peer-reviewed documentation of this protocol's effectiveness, combined with its acceptance by the EU for trade purposes, provides strong scientific and regulatory validation for surveillance-based management of HPAI in ostriches.

United States Management of H5N1 in Dairy Cattle

The United States' approach to managing H5N1 in dairy cattle provides perhaps the most relevant and compelling comparison for policy consideration. When H5N1 was first detected in dairy herds in Texas in March 2024, it marked an unprecedented development, the first

confirmed instance of highly pathogenic avian influenza causing clinical disease in cattle.[84] The situation rapidly evolved, with detections in 12 states across the American dairy belt by August 2025, affecting over 200 herds and potentially exposing thousands of dairy workers to the virus through direct contact during milking operations.

Notably, the United States Department of Agriculture did not mandate depopulation of affected dairy herds, despite the novel nature of H5N1 in cattle, the extensive human exposure through milking operations, and the entry of milk into the human food supply chain. Instead, USDA implemented Federal Order 2024-02 requiring testing of lactating dairy cattle before interstate movement, mandatory reporting of positive cases, implementation of enhanced biosecurity measures, but explicitly not requiring destruction of infected or exposed animals.[85] Affected herds were placed under quarantine-like movement restrictions, but milk from recovered cows was allowed to enter the food supply after pasteurization, and recovered animals returned to full production.

The scientific basis for this approach was articulated in USDA's April 2025 Final Programmatic Environmental Impact Statement on HPAI Response. USDA APHIS's 2025 Record of Decision for its HPAI programmatic EIS selected the "Federal Operational Assistance with Biosecurity Incentive" alternative specifically for poultry outbreaks, not cattle. [86] This policy recognizes that recovered animals, when properly monitored, do not pose ongoing disease risks. [87]

The risk comparison between US dairy cattle and our ostriches is instructive and compelling. US dairy cattle with H5N1 involve twice-daily human contact through milking with workers in direct physical contact with potentially infected animals, mechanical milking equipment that could theoretically aerosolize virus through vacuum systems and pulsation, bulk tanks that commingle milk from multiple animals creating potential for virus concentration, complex logistics involving feed delivery, veterinary services, milk hauling, and equipment maintenance creating numerous potential transmission pathways, and direct entry into the human food supply chain, albeit with pasteurization as a critical control point. Despite these complexities and risks, the United States has successfully managed the situation through surveillance and biosecurity without depopulation, with no documented human infections from dairy sources as of September 2025. In US poultry, APHIS's preferred HPAI framework links indemnity eligibility to successful NPIP-based biosecurity audits, enabling continuity of business under risk-managed conditions. This does not displace depopulation on infected poultry premises; rather, it couples rapid eradication with audited biosecurity and testing to minimise spread and support recovery, an accountability architecture we mirror through third-party audits and enhanced surveillance.

In contrast, our ostrich operation involves minimal human contact, no mechanical processing or milking equipment, no entry into the human food chain, complete isolation in outdoor pens 10 feet from public access, and most critically, 237 days of documented health versus active infection in dairy herds. The risk differential is not marginal but represents orders of magnitude difference in both transmission potential and public health implications.

International Consensus on Proportionate Response

Taken together, these international standards and precedents reveal a clear global consensus that surveillance-based approaches can appropriately demonstrate freedom from highly pathogenic avian influenza after suitable disease-free periods. Under WOAH Terrestrial Code Chapter 10.4, disease freedom is demonstrated through surveillance and sanitary measures calibrated to context; our 237-day, multi-round design materially exceeds those surveillance expectations. The European Union operationalizes disease freedom with 21-day (protection zone) and 30-day (surveillance zone) clearance periods under Articles 39 and 55 of Delegated Regulation 2020/687, coupled with testing requirements that we surpass by factors of 11.3 and 7.9 respectively. South Africa has adapted these principles specifically for ostriches through a scientifically validated protocol documented in peer-reviewed literature, recognizing that different species may require tailored approaches, and we exceed their proven protocol by 5.6-fold. The United States has extended the principle to mammals with ongoing human contact, preserving infected cattle through recovery while we seek to preserve recovered birds with no human food chain involvement. Our audited biosecurity and intensified surveillance protocol accords with the WTO SPS Agreement: measures must be based on scientific principles and risk assessment and applied only to the extent necessary, taking account of minimising negative trade effects. SPS does not dictate a single operational choice; it requires that the selected measure be proportionate to the actual risk and supported by current evidence.

A review of the record for major jurisdictions found no examples of destruction orders being maintained this long after recovery under conditions comparable to the present case; maintaining such an order here would therefore be an outlier relative to prevailing practice. Canada's insistence on destruction after 237 days would represent an outlier position so extreme that it would invite questions about the scientific basis for Canadian regulatory decisions and potentially undermine Canada's advocacy for science-based standards in international trade forums.

V. CANADIAN PRECEDENTS AND CFIA'S EVOLVING APPROACH

The Scrapie Pilot Project: A Direct Precedent for Genetic Preservation

On August 13, 2025, while our case was actively under consideration, CFIA announced a pilot project that fundamentally contradicts any assertion that disease detection must automatically result in destruction. The "Scrapie Pilot Project: Assessing Genetic Resistance in Positive Goat Herds--'an alternate disease response option to total herd depopulation'" for scrapie-infected goat herds, marking a pivotal shift in CFIA's approach to managing serious animal diseases.[11] Under this pilot, when scrapie is detected in a goat herd, instead of automatically destroying all animals as has been the historical practice since the 1940s, CFIA now allows producers to genotype their animals to identify those carrying genetic variants associated with scrapie resistance, specifically the S146 and K222 alleles that confer resistance to classical scrapie.[88] While PRNP genotype materially influences susceptibility, resistance is not absolute. Atypical scrapie and additional host factors can still permit disease despite resistant genotypes (Goldmann, 2008, Vet. Res.).

Animals with resistant genotypes are spared from destruction and the herd is managed under long-term quarantine with movement restrictions for five years, annual testing requirements, and strict record-keeping obligations. CFIA explicitly stated in its announcement that this approach "aims to both preserve valuable genetics and protect the national herd" while still working toward eventual disease eradication. The pilot brings Canada into alignment with approaches used in the United States under USDA's Scrapie Eradication Program and the European Union under Regulation (EC) No 999/2001, which have long recognized that genetic resistance can be incorporated into disease management strategies.[89]

Application to Our Ostrich Population

These birds represent 32 years of continuous ostrich farming operations at Universal Ostrich Farms, with multi-generational development of genetics adapted to Canadian conditions.^5^ While formal breeding records spanning the entire period are not maintained, the biological evidence speaks powerfully: the flock's demonstrated 85% survival rate from H5N1, compared to typical 95-100% mortality in poultry--provides compelling proof of unique genetic traits that cannot be readily replaced. This survival rate represents not random chance but the cumulative result of three decades of natural selection and farming decisions that, whether formally documented or not, have produced a population uniquely suited to both Canadian conditions and disease resistance.

The relevance of the scrapie pilot to our situation is directly applicable and the precedent compelling. Like the scrapie-resistant goats that CFIA has now chosen to preserve rather than destroy, our ostriches have demonstrated natural resistance to a disease that typically devastates affected populations--85% survival where poultry operations see 95-100% mortality, often within 48-72 hours of infection. This inverse mortality pattern, where the vast majority survived rather than perished, represents a biological phenomenon worthy of preservation and study.

Like the genetic value recognized in heritage goat breeds that have been selected over generations for Canadian conditions, our 32 years of continuous ostrich farming operations represent irreplaceable genetic heritage that cannot be recreated. The H5N1 survival trait demonstrated through actual disease challenge, not theoretical resistance but proven survival under real-world viral exposure--would require decades to potentially reproduce, if reproduction were even possible. No laboratory can simulate three decades of environmental adaptation, no breeding program can guarantee the emergence of disease resistance traits, and no amount of investment can accelerate the generational time required for genetic selection in a species that doesn't reach sexual maturity until age 3-4 years and has a reproductive life spanning two decades.

Like the long-term quarantine and monitoring approach adopted for scrapie management, where affected premises remain under restriction for five years with regular surveillance, we propose comprehensive surveillance that would exceed any requirements in the scrapie pilot through quarterly testing indefinitely. Our proposed protocol of testing 135 birds (35% of the flock) providing 99% confidence at 3% prevalence detection substantially exceeds typical surveillance requirements, and our commitment to indefinite quarterly monitoring surpasses the scrapie pilot's annual testing requirement.

The Critical Disease Distinction

The critical distinction that makes our case even stronger on the facts than the scrapie precedent is the fundamental nature of the diseases involved. Scrapie is a transmissible spongiform encephalopathy, a prion disease characterized by accumulation of misfolded prion proteins in neural tissue leading to invariably fatal neurodegeneration. There is no treatment, no recovery, and no immunity. Infected animals will inevitably develop clinical disease and die, with incubation periods ranging from 2-5 years. The disease is insidious, with subclinical animals potentially spreading infection for years before showing symptoms. Prions persist in the environment for years, resist standard disinfection procedures, and can transmit through contaminated feed, equipment, and even soil. Despite this grim prognosis and ongoing transmission risk, CFIA has recognized that preserving resistant animals under appropriate management is justified by the value of genetic conservation.

In stark contrast, H5N1 is an acute viral infection with a completely different disease trajectory. Birds either die within days or recover completely with immunity. There is no chronic carrier state, no years-long incubation, no inevitable progression to death. The influenza virus, unlike prions, is readily inactivated by environmental conditions, standard disinfectants, UV light, and temperature extremes. After 237 days--far exceeding the environmental persistence possible under field conditions--any theoretical viral presence has been eliminated through multiple cycles of environmental degradation.

Our ostriches have not only survived but have been completely healthy for 237 days, showing complete recovery with probable immunity that protects against re-infection. While the goats in the scrapie pilot remain at perpetual risk--they could still develop disease years from now despite resistant genotypes--our birds have definitively cleared the infection. The risk profiles are not comparable: one involves ongoing management of animals that may still die from disease, the other involves recovered animals with established immunity.

The Logical Imperative

If CFIA can justify preserving goats that are exposed to an incurable, invariably fatal prion disease with ongoing transmission risk for years, the justification for preserving ostriches that have completely recovered from and developed immunity to an acute viral infection is not merely stronger but represents an entirely different category of risk that is orders of magnitude lower. The scrapie pilot acknowledges that genetic value can outweigh even the risks of managing an incurable prion disease. Our situation presents genetic value (demonstrated H5N1 resistance) with essentially no remaining disease risk (237 days of health following complete recovery).

To destroy recovered, immune birds while preserving prion-exposed animals would represent an inversion of risk-based decision-making that cannot be reconciled with scientific principles or policy consistency. The precedent has been set: when genetic value exists, management alternatives to destruction are not only possible but preferred. Our case, with its demonstrated recovery, established immunity, and negligible ongoing risk, presents an even more compelling argument for preservation than the scrapie scenario that CFIA has already approved.

Chronic Wasting Disease: Long-term Management Without Depopulation

Provincial approaches to Chronic Wasting Disease (CWD) in farmed cervid populations provide additional examples of long-term disease management without automatic depopulation, demonstrating that even invariably fatal diseases can justify preservation for research purposes. CWD is ultimately fatal with environmental persistence and incubation of 18 months-5 years. PRNP polymorphisms influence susceptibility (e.g., WTD 96S, elk 132L) but provide risk modulation rather than absolute immunity (Haley & Hoover, 2015).[90] When CWD is detected in farmed cervid herds, the standard federal response under the *Health of Animals Act* is complete depopulation with compensation.

However, several provinces have implemented research programs that maintain CWD-positive herds under strict containment for long-term study. Alberta Innovates (home to Alberta Prion Research Institute programs) reported 2023-24 grant support for agriculture and chronic wasting disease projects, evidencing provincial investment in research capacity aligned with risk-managed preservation.[91] Saskatchewan's Western College of Veterinary Medicine maintains a smaller research population of 23 infected white-tailed deer for similar purposes. These programs demonstrate that even with diseases posing significant challenges, invariably fatal progression, environmental contamination with infectious prions, and potential for transmission to wild populations, there can be scientific value justifying preservation under appropriate containment.

The protocols for these research herds include double fencing with 3-meter height to prevent escape and contact with wild cervids, 24-hour video surveillance with motion detection systems, mandatory testing of all mortalities with carcass incineration, restricted access limited to research personnel with full PPE, and indefinite quarantine with no endpoint anticipated. The justification for maintaining these infected populations despite the risks is the scientific value of understanding disease dynamics in controlled settings, developing diagnostic tools including live-animal tests, evaluating potential interventions including vaccines and therapeutics, and studying genetic factors influencing susceptibility and progression.[93] These programs recognize that destroying all affected animals immediately might provide short-term disease control but eliminates opportunities for learning that could benefit long-term management strategies.

Our proposed research program for recovered, immune ostriches presents lower risk with equal or greater scientific value. We would study immunity in recovered animals rather than disease in infected ones, work with birds posing "negligible to non-existent" transmission risk rather than actively infected animals, and investigate protective mechanisms that could inform pandemic preparedness rather than studying inevitable disease progression. If provinces can maintain actively infected deer with fatal prion disease for research, the justification for maintaining recovered, immune ostriches is overwhelmingly stronger.

CFIA's Own Policy Framework Supporting Flexibility

Beyond specific disease examples, CFIA's own policy framework supports flexible, risk-based approaches to disease management. The agency's Compliance and Enforcement Policy, dated

November 1, 2020, establishes guiding principles for how CFIA exercises its regulatory authorities.[92]

CFIA's Compliance and Enforcement Policy requires a risk-based, proportionate selection of responses within a graduated continuum, with inspectors retaining discretion to tailor actions to the gravity of the risk, compliance history, and intent. Actions are to be results-oriented--i.e., those that most effectively achieve human, plant and animal-health outcomes with efficient use of resources. These governance principles endorse the audited, surveillance-based approach advanced here in light of 237 days of documented health. [93]

Section 7.5, "Results-oriented," further reinforces this flexibility: "Control and enforcement actions are selected to have the most positive impact on human, plant and animal health and safety outcomes based on the efficient and effective use of the Agency's resources whenever appropriate and possible."[94] After 237 days without disease and with expert assessment of negligible risk, destruction would not represent the "most positive impact" when management alternatives can achieve safety objectives while preserving valuable resources.

The Policy's Section 7.2, addressing "Fairness, predictability and consistency," emphasizes that while procedures should be applied nationally for consistency, the actual enforcement response must consider the specific context.[95] Section 7.3 on "Transparency" requires that CFIA provide "relevant, accurate and timely information" and that non-compliant parties be "made aware of the facts associated with violations."[96] Maintaining a destruction order based on 8-month-old inspection data when current conditions have fundamentally changed raises questions about whether these transparency and currency requirements are being met.

The Policy explicitly acknowledges in Section 8.0 that "the inspector has the flexibility to select the appropriate action based on the gravity of the non-compliance which is determined by considering the potential or actual harm, the compliance history of the regulated party and the intent associated with the non-compliance."[97] The document further states that gravity assessment considers:

- **Harm**: the seriousness of harm or potential harm, including impact on human health, animal resource base, or environment
- **History**: the compliance history including previous instances and their seriousness
- **Intent**: whether the regulated party knowingly contravened requirements [100]

Applying these factors to our situation: the harm is now assessed as "negligible" by expert opinion after 237 days without disease; the compliance history shows 254 consecutive days of perfect adherence to all quarantine requirements; and there is no evidence of intentional contravention. Under CFIA's own framework, these factors support a proportionate response through management rather than destruction.

Additional Relevant Policy Sections

The Policy's Appendix A explicitly outlines CFIA's Compliance and Enforcement Continuum, which progresses from compliance promotion through verification to regulatory response.

Importantly, the continuum emphasizes that "CFIA supports compliance by providing regulated parties with the tools, resources, guidance, and services they may need to become familiar with and follow regulatory requirements."[98] The Policy states that CFIA uses "a risk-informed approach" to conduct inspections and that "when they are not" in compliance, CFIA "may use control actions to address any immediate risk, as well as enforcement actions once non-compliance has been determined."[99]

The use of "may" rather than "must" throughout the enforcement sections confirms the discretionary nature of enforcement decisions, consistent with the statutory language in the *Health of Animals Act* that the Minister "may" order destruction rather than "shall" order it.

Our situation presents exactly the type of unique circumstances warranting tailored response: recovered birds showing long-term health unprecedented in HPAI outbreaks, established biosecurity proven effective over 254 days, exceptional scientific value recognized through an estimated $3.5 million in research partnerships, and genetic resources developed over 32 years that cannot be replaced. These factors align with the policy's Section 7.4 requirement to consider that 'specific facts relating to cases of non-compliance may vary considerably' and Section 7.5's emphasis on selecting actions with 'the most positive impact on human, plant and animal health and safety outcomes.

VI. COMPREHENSIVE LEGAL AND POLICY ANALYSIS

Statutory Framework and Ministerial Discretion

The statutory framework of the *Health of Animals Act* provides clear and unambiguous authority for the Minister to approve alternatives to destruction when circumstances warrant such flexibility. Section 13(2)(a) of the Act explicitly empowers the Minister to "reserve animals that are affected or contaminated or suspected of being affected or contaminated for treatment or for experimentation or research purposes." [1] This provision directly contemplates our situation, Parliament has already authorized preservation of exposed animals for research purposes when the Minister determines such preservation serves legitimate objectives. The estimated $3.5 million research program documented in executed agreements with established biotechnology partners makes this provision directly applicable to our request.

Section 48 of the Act, which addresses the Minister's powers regarding infected or contaminated animals, deliberately uses permissive rather than mandatory language, stating that the Minister "may" order destruction. [100] This careful choice of legislative language was not accidental but reflects Parliament's intent to provide flexibility in responding to diverse disease situations. The use of "may" rather than "shall" or "must" indicates that destruction is one option available to the Minister but not an obligatory response regardless of circumstances.

The Federal Court has consistently held that where Parliament grants discretion through permissive language, that discretion must be exercised based on relevant factors and current evidence. In *Maple Lodge Farms Ltd. v. Government of Canada*, [1982] 2 S.C.R. 2, the Supreme Court established that discretionary powers must not be exercised arbitrarily but must consider the factual matrix before the decision-maker.[101] Mechanically applying a destruction policy

without considering 237 days of health, established immunity confirmed by expert assessment, exceptional research value, and availability of management alternatives would constitute improper fettering of the discretion Parliament intended the Minister to exercise.

The interpretation of these provisions must also consider the purposes of the *Health of Animals Act* as set out in its preamble and operative provisions. While disease control is clearly a primary objective, the Act also recognizes the importance of supporting agricultural industries and advancing scientific knowledge. Section 13(2)(a)'s specific provision for research designations demonstrates Parliament's intent that valuable animal populations serving scientific purposes should be preserved when disease control objectives can be achieved through management rather than destruction. This purposive interpretation, required under modern statutory interpretation principles, supports approval of our proposed protocol.

The Comprehensive Testing and Surveillance Protocol

The proposed testing and surveillance protocol exceeds every international standard by substantial margins, providing multiple layers of verification that would satisfy the most stringent disease control requirements. The baseline testing of 135 birds, representing 35% of our flock, would occur within 48 hours of approval. This sample size is calculated using the Cameron & Baldock finite-population framework for freedom-from-disease surveys to provide 99% statistical confidence in detecting disease if present at 3% prevalence or higher. While WOAH does not mandate specific statistical parameters for surveillance, leaving Member Countries to justify appropriate design based on their context, common practice endorsed in WOAH guidance documents utilizes 95% confidence at 5% prevalence as a baseline for demonstrating disease freedom. Our protocol substantially exceeds this conventional threshold, providing 4% better confidence while detecting disease at 40% lower prevalence--a significant enhancement in surveillance sensitivity that surpasses standard epidemiological practice for disease freedom demonstrations.

The testing methodology would employ both RT-PCR for viral RNA detection and serological testing for antibody responses. RT-PCR testing would use primers targeting the M gene for broad influenza A detection and H5-specific primers for subtype confirmation, with a cycle threshold (Ct) cutoff of 20 for maximum sensitivity. All testing would be performed at Canadian Food Inspection Agency-approved laboratories with ISO 17025 accreditation for animal disease diagnostics. All testing will use split samples enabling independent third-party verification at CFIA-designated ISO 17025-accredited laboratories, ensuring transparency and scientific rigor. Serological testing would employ both hemagglutination inhibition (HI) assays, the traditional gold standard with defined positive titers ≥1:16, and ELISA testing for both IgG and IgM antibodies to distinguish recent from historical exposure. This dual approach provides complementary information, with RT-PCR detecting active infection and serology indicating exposure history and immune status.

Following baseline testing, surveillance would continue at days 21, 45, and 90, then quarterly indefinitely. This timeline aligns with international standards while providing multiple confirmation points: Day 21 aligns with the EU's minimum surveillance period, Day 45 provides intermediate confirmation exceeding South Africa's protocol, Day 90 represents final validation

at triple the WOAH standard, and quarterly ongoing surveillance ensures continued verification. Each testing round would include the same comprehensive sampling of 135 birds, environmental sampling of water, soil, and equipment, and clinical health assessments by qualified veterinarians.

Science-Based Response Framework

Our protocol ensures that disease control is never compromised while avoiding unnecessary destruction of healthy, immune animals. The response framework incorporates multiple verification steps and proportionate actions:

Upon any preliminary positive result from surveillance testing:

1. IMMEDIATE NOTIFICATION AND ISOLATION

- CFIA notification within 2 hours of preliminary results
- Precautionary isolation of the relevant cohort
- Enhanced biosecurity measures for affected area
- Suspension of any movement from isolated cohort

2. COMPREHENSIVE CONFIRMATORY TESTING

- Split-sample testing at National Centre for Foreign Animal Disease
- Independent third-party laboratory verification
- Serological assays to distinguish active infection from immunity
- Virus isolation attempts to confirm replication-competent virus
- Expert panel review including independent virologist assessment

3. EVIDENCE-BASED RESPONSE DETERMINATION

The distinction between residual genetic fragments (indicating past infection/immunity) and replication-competent virus (indicating active infection) is critical. As established in published literature (Pantin-Jackwood & Swayne, 2009), recovered birds may test positive for viral RNA fragments for weeks after clearing infection, despite posing no transmission risk.

Response measures would be proportionate to verified evidence:

- Residual fragments only → Continue monitoring, no culling required
- Replication-competent virus confirmed → Targeted removal of confirmed positive cohort only
- Evidence of active transmission → Expanded testing and proportionate response

4. INDEPENDENT OVERSIGHT MECHANISM

To ensure decisions are grounded in current science and proportionality:

- Formation of Technical Review Committee including CFIA, independent experts, and farm representation
- Required consensus or majority decision for any depopulation orders
- Right to appeal with 48-hour stay pending review
- All decisions documented with scientific justification

This framework preserves CFIA's statutory authority under the Health of Animals Act while ensuring that any destructive measures are scientifically justified, independently verified, and proportionate to actual risk. The goal is transparent, evidence-based decision-making that protects both animal health and valuable genetic resources.

Research Integration Under Comprehensive Biosecurity

The preservation of this flock would enable critical research advancing understanding of H5N1 immunity while maintaining strict biosecurity throughout all research activities. The established partnerships with Struthio BioScience Inc. and Ostrich Pharma KK, documented in executed agreements totaling an estimated $3.5 million in funding, provide the framework for structured research activities.[6] [7] These partnerships focus on four key research areas, each with specific deliverables and timelines.

First, characterizing antibody responses in recovered birds through epitope mapping using peptide arrays and crystallography, affinity maturation studies tracking antibody evolution over time, and cross-reactivity assessment against multiple H5N1 clades and other influenza subtypes. Second, understanding the molecular basis for ostrich resilience through comparative genomics with susceptible species, gene expression analysis of immune response pathways, and identification of genetic markers associated with survival. Third, developing diagnostic tools based on ostrich antibodies including rapid point-of-care tests for H5N1 detection, therapeutic antibodies for passive immunization, and improved vaccines incorporating identified protective epitopes. Fourth, exploring pandemic preparedness applications through development of stockpiled antibody preparations, masks and filters incorporating neutralizing antibodies, and therapeutic protocols for post-exposure prophylaxis.

Research would primarily use eggs collected daily with established biosafety protocols. Eggs would be surface disinfected with 0.1% sodium hypochlorite solution, packaged in secure, labeled containers with chain-of-custody documentation, transported only to pre-approved BSL-2 or higher laboratories, and processed in biological safety cabinets with appropriate containment. Biological samples would be collected during routine health monitoring by trained personnel under veterinary oversight using standard venipuncture techniques, with samples processed on-site in a designated area with appropriate PPE and waste management. No live virus work would ever be conducted on the farm, with all infectious agent research restricted to appropriate containment facilities.

Economic Considerations Supporting Preservation

The economic analysis demonstrates catastrophic and largely uncompensated losses from destruction that raise serious questions about proportionality and fairness. The total economic

impact of $18,497,500 includes direct flock value based on current market pricing of $7,500 per breeding bird,[19] immediate termination of research partnerships worth an estimated $3.5 million, [6] [7] infrastructure and specialized equipment investments estimated at $1,600,000 rendered worthless without the flock, and lost economic activity of $2.1 million annually affecting approximately 85 direct and indirect jobs.[22] [23] Against these losses, maximum statutory compensation under the *Health of Animals Act* would provide only $1,155,000, covering less than 6% of actual damages. [24]

This 94% uncompensated loss represents not marginal regulatory burden but economic devastation that would destroy a 32-year agricultural enterprise. The compensation scheme, designed for commercial poultry where birds worth $10-20 reach market weight in 6-8 weeks, fails catastrophically when applied to ostriches worth hundreds of times more that require 3.5 years to reach breeding age. Each breeding ostrich represents not just current value but future production potential over a 20+ year reproductive life, none of which is recognized in the compensation formula.

The farm's good-faith investment of $10,000 in biosecurity upgrades in 2024, made during the outbreak to meet evolving requirements, demonstrates commitment to compliance and cooperation with CFIA. These investments, made with the reasonable expectation that compliance would allow continued operation, would be rendered worthless by destruction. This raises questions of regulatory fairness when those who invest in compliance face the same outcome as those who might not.

VII. ADDRESSING ANTICIPATED CONCERNS COMPREHENSIVELY

The December 2024 Reporting Timeline and Subsequent Compliance

We acknowledge with complete candor that the farm's initial response to mortalities observed in December 2024 did not immediately involve notification to CFIA, with formal notification occurring on December 28, 2024, after mortality patterns suggested infectious disease. We acknowledge this reporting delay fell short of optimal disease surveillance standards.

In late December 2024, we initially believed the flock was experiencing a recurrence of *Pseudomonas aeruginosa*, as the symptoms were identical to those we had observed in February 2020. At that time in 2020, we collected tissue samples and brought them to our veterinarian, who submitted them to the Abbotsford laboratory (Animal Health Centre- Province of British Columbia) where the diagnosis was confirmed as *Pseudomonas aeruginosa*. In December 2024, the same treatment protocols were applied, the ostriches were responding and recovering in the same way as they had in 2020. For this reason, we continued to believe the mortalities were attributable to *Pseudomonas* right up until the H5 test results were returned. Based on the similarity in presentation and recovery, we continue to question whether the mortalities attributed to avian influenza may, in fact, have been the result of *Pseudomonas*.

In our opinion, at least a significant portion of the 69 mortalities in December 2024 and January 2025 were the result of *Pseudomonas aeruginosa*, as the symptoms, progression, and response to treatment mirrored what we had previously experienced in February 2020. Unfortunately, we

were prevented from conducting further testing to confirm this, leaving open the strong possibility that many of these deaths were due to *Pseudomonas* rather than avian influenza.

However, three critical factors must be considered in evaluating this acknowledged shortcoming.

First, from December 28, 2024, forward, 254 consecutive days, the farm has maintained compliance with CFIA requirements. Every inspection requirement has been met, every movement restriction has been observed, every biosecurity protocol has been followed, and every request for information has been promptly fulfilled. This 254-day compliance record demonstrates commitment to regulatory requirements that far outweighs a single historical reporting delay.

Second, the reporting delay had no impact on disease outcomes or spread. No other premises were affected by the outbreak, no disease spread occurred beyond the original farm, no additional birds died as a result of the delay, and no human infections occurred. The same quarantine measures would have been implemented whether reporting occurred on December 15 or December 28. The delay was procedural, not substantive in its impact on disease control.

Third, destroying healthy birds after 237 days based on an 8-month-old reporting delay would be punitive rather than protective. In Canadian administrative law, as established in *Baker v. Canada*, past non-compliance does not permanently eliminate statutory discretion or justify perpetual punishment regardless of subsequent conduct or changed circumstances.[102] The principle of proportionality requires balancing objectives with impacts, and destruction after 237 days of health and 254 days of perfect compliance cannot be proportionate to a historical reporting delay with no substantive impact.

Biosecurity Measures and Their Proven Effectiveness

Our biosecurity system has achieved what matters most: 254 consecutive days without disease. While necessarily adapted for 150-kilogram birds standing 2 meters tall that cannot be housed in conventional poultry barns, these measures have proven completely effective at preventing disease transmission. Ostriches would destroy themselves attempting to escape enclosed buildings, requiring outdoor management that necessitates different biosecurity approaches than indoor poultry systems.

The effectiveness of current measures is demonstrated not by their similarity to poultry standards but by their outcomes. The remote location providing natural isolation, existing perimeter fencing controlling all access, permanent removal of the water source that attracted wild birds and restriction to five trained personnel with documented protocols, with dedicated equipment have collectively prevented any disease occurrence for 254 days. This extended period of success provides empirical validation that appropriate biosecurity for the species can achieve disease control objectives.

We commit to implementing any reasonable enhancements CFIA recommends that are feasible for ostrich operations, including enhanced wildlife deterrence using visual and auditory devices,

increased surveillance and monitoring frequencies, additional personnel training requirements, modified operational procedures, and third-party biosecurity audits. Our commitment is to continuous improvement while recognizing the inherent differences between ostrich and conventional poultry production systems that require adapted approaches.

Public Health Considerations

Zero human infections occurred during the active outbreak when risk was highest, when workers handled dying birds and contaminated materials without knowing H5N1 was present. This real-world evidence from the highest risk period demonstrates that transmission risk in this context is lower than theoretical models might suggest. After 237 days without disease, the public health risk has progressed from low during the outbreak to "negligible to non-existent" according to Dr. Pelech's expert assessment.

Current public health protections include access limited to five trained personnel with appropriate PPE, no entry into the human food supply chain unlike US dairy operations, remote location preventing public exposure, and comprehensive health monitoring of all personnel. The public health risk from our recovered ostriches after 237 days is objectively lower than many accepted agricultural practices, including US dairy workers milking H5N1-positive cattle daily and conventional poultry workers managing millions of birds in confined spaces.

Long-term Management Feasibility

We have already proven long-term management capability through 254 days of successful quarantine without a single breach. This demonstrated track record provides empirical evidence that extended management is not just theoretically possible but practically achievable. The estimated $3.5 million in research contracts that terminate instantly upon any biosecurity breach create overwhelming financial incentive for perfect compliance, the farm cannot afford even minor lapses.

The proposed quarterly testing regime would become routine, similar to other health programs standard in livestock production. The cost of testing, which the farm commits to bear entirely, is modest compared to the value of preservation. Environmental sampling can be incorporated into regular maintenance activities. The commitment to indefinite CFIA oversight demonstrates recognition that maintaining this flock requires ongoing vigilance and regulatory supervision.

VIII. THE PATH FORWARD: CONSTRUCTIVE SOLUTIONS

Primary Request: Approval of the Risk-Managed Alternative Control Protocol

We respectfully request that the Minister exercise the discretion explicitly provided under sections 48 and 13(2)(a) of the *Health of Animals Act* to approve the Risk-Managed Alternative Control Protocol. After 237 days of documented health, exceeding international standards by unprecedented margins, destruction serves no disease control purpose while causing irreparable harm to valuable genetic resources, an estimated $3.5 million in research programs, and 85 jobs.

The proposed protocol aligns perfectly with international standards while exceeding them by substantial margins. Implementation could begin within 48 hours of approval: testing laboratories are confirmed with capacity allocated, sampling protocols are established with trained personnel ready, biosecurity measures proven over 254 days remain in place, and research partners stand ready to commence studies. Approval would mean immediate implementation of testing exceeding all international standards, continued quarantine with enhanced biosecurity, preservation of irreplaceable genetics developed over 32 years, continuation of pandemic preparedness research, and prevention of economic devastation in rural communities.

Confidence Building Framework: Structured Pathway to Full Operations

Recognizing that 237 days of documented health already provides extraordinary evidence of safety, we propose a structured framework that allows immediate resumption of essential farm operations while building additional confidence through enhanced monitoring. This framework acknowledges that the farm has been unable to conduct any business since December 2024, causing ongoing economic devastation without scientific justification.

Core Principles:

- Immediate authorization for egg sales and research contracts (non-food chain products)
- Progression through phases based on objective criteria, not arbitrary timelines
- Automatic advancement unless specific evidence indicates risk
- Maximum 12-month total framework duration with clear exit criteria

Phase Structure:

PHASE ONE: IMMEDIATE IMPLEMENTATION (Months 0-3)

- Baseline serological testing across representative sample (30% of flock)
- Results reviewed by joint CFIA-Expert Committee
- Egg sales and research activities authorized immediately
- Weekly health monitoring with monthly reporting
- Advancement Criteria: No evidence of active infection in baseline testing

PHASE TWO: EXPANDED RESEARCH OPERATIONS (Months 4-9)

- Research activities expanded under approved protocols
- Antibody collection from eggs for therapeutic development
- Bi-monthly surveillance testing (serological focus)
- Quarterly committee review of results
- Advancement Criteria: Continued negative surveillance results

PHASE THREE: NORMALIZED OPERATIONS WITH MONITORING (Months 10-12+)

- Controlled movement of genetic material under permits
- Quarterly surveillance continuing indefinitely
- Annual review of monitoring requirements
- Full operational capacity while maintaining biosecurity

AUTOMATIC PROGRESSION PROVISION:

Advancement to the next phase occurs automatically at specified intervals unless the Technical Review Committee identifies specific, evidence-based concerns. Any decision to delay progression must be:

- Based on documented scientific evidence
- Subject to independent review
- Accompanied by specific criteria for advancement
- Time-limited with maximum 30-day extensions

This framework provides structured confidence-building while recognizing that continued business prohibition after 237 disease-free days lacks scientific justification and causes irreparable economic harm.

Collaborative Protocol Development

We remain completely open to collaborative development of management protocols with CFIA, recognizing the agency's expertise could enhance the proposed approach. We propose establishing within 30 days a joint working group including CFIA veterinarians, farm technical staff, Dr. Pelech and other scientific experts, and potentially international advisors with ostrich disease experience. This group would meet bi-weekly to refine protocols, assess outcomes, and ensure all concerns are addressed.

This collaborative approach would position Canada as a leader in developing nuanced, risk-based approaches to disease management that preserve valuable resources while maintaining the highest health standards. The protocols developed could benefit the entire agricultural sector when facing similar situations, establishing Canada as a sophisticated regulator capable of evidence-based, proportionate responses.

FORMAL REQUEST TO THE MINISTER

Universal Ostrich Farms Inc. respectfully requests that the Minister:

1. RESCIND the Notice to Dispose dated December 31, 2024, recognizing that 237 days of complete health has fundamentally eliminated the factual basis for destruction;

2. DESIGNATE the flock under section 13(2)(a) of the *Health of Animals Act* for research purposes, acknowledging the unique scientific value of Canada's only H5N1-recovered ostrich population;

3. APPROVE the Risk-Managed Alternative Control Protocol detailed in this submission, including the Science-Based Response Framework and Confidence Building Framework that ensure proportionate, evidence-based decision-making while enabling immediate resumption of farm operations;

4. AUTHORIZE immediate implementation of confirmatory testing within 48 hours to validate disease-free status and establish surveillance baselines.

We respectfully request a decision within 15 days, as ongoing losses accumulate daily and research partnerships require certainty to proceed with time-sensitive work.

CONCLUSION

After 237 consecutive days of documented health, exceeding requirements for disease freedom recognition by 8.5 times under WOAH standards, the EU's 21-30 day requirements by 7.9-11.3 times, and South Africa's ostrich-specific testing protocol by 5.6 times, the ostrich flock at Universal Ostrich Farms has achieved complete recovery from the December 2024 H5N1 event.

The scientific assessment by Dr. Steven Pelech, who describes the current infection risk as negligible with 'no practical risk' of transmission after the flock's complete recovery, combined with the biological evidence that influenza viruses cannot establish chronic infections in birds, eliminates any disease control justification for destruction.

The legal framework explicitly supports preservation. Section 13(2)(a) of the *Health of Animals Act* directly authorizes preserving animals for research purposes, precisely our request with an estimated $3.5 million in committed research funding. The Federal Court of Appeal has confirmed that reconsideration based on current circumstances is appropriate, while identifying that the original inspectors' belief they had "no discretion" constituted impermissible fettering requiring correction.

CFIA's own precedents demand consistency. The Scrapie Pilot Project, announced while our case was under consideration, preserves animals exposed to an invariably fatal prion disease based on genetic value. If CFIA preserves animals facing certain death from an incurable disease, logic demands preserving animals that recovered from a survivable infection 237 days ago.

After 237 consecutive days of documented health, fulfilling and substantially exceeding WOAH's surveillance-based expectations under Chapter 10.4, the ostrich flock at Universal Ostrich Farms has achieved complete recovery from the December 2024 H5N1 event. International standards are unanimous--a review of the record for major jurisdictions found no examples of destruction orders being maintained this long after recovery under conditions comparable to the present case. The United States preserves H5N1-infected dairy cattle with daily human contact. The EU clears establishments after 21-30 days. South Africa requires only two consecutive negative RT-PCR results 21 days apart for ostriches. Canada would stand entirely alone in unprecedented severity without scientific justification.

The economic consequences of destruction would be catastrophic: $17.3 million in uncompensated losses (94% of total impact), immediate termination of an estimated $3.5 million in active research contracts, elimination of 85 rural jobs, and permanent loss of irreplaceable genetics including the unique H5N1 survival trait. These consequences would occur to address a risk that no longer exists.

The evidence is unequivocal. Every scientific, legal, economic, and policy consideration points toward preservation as the only proportionate, reasonable, and evidence-based response. The alternative, destroying healthy, immune birds to cause $18.5 million in damage while making Canada a global outlier, cannot be justified by any disease control objective.

We respectfully urge the Minister to approve our request, preserving irreplaceable resources while maintaining Canada's reputation for proportionate, science-based regulation.

Respectfully submitted,

Universal Ostrich Farms Inc.
September 10, 2025

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[1] Health of Animals Act, S.C. 1990, c. 21, ss. 48, 13(2)(a).

[2] WOAH Terrestrial Code (2024), Ch. 10.4: Art. 10.4.6 (28 days after stamping-out); Art. 10.4.28 (surveillance-based 12-month demonstration when stamping-out not applied); Art. 10.4.1(2)(c) (14-day flock incubation).

[3] Canadian Food Inspection Agency, Last On-Site Presence, February 26, 2025 (193 days before this submission; no sick birds observed at that time, 42 days post-final mortality).

[4] Universal Ostrich Farms Inc., Correspondence to CFIA, March 15, April 22, May 30, June 18, July 25, and August 14, 2025 (requesting follow-up testing and inspection).

[5] Universal Ostrich Farms Inc., 32-Year History, 1993-2025 (continuous ostrich farming operations demonstrating multi-generational genetic development).

[6] Ostrich Pharma KK and Universal Ostrich Farms Inc., Partnership Agreement, 2024-2025 (research collaboration dependent on flock access)

[7] Struthio BioScience Inc. and Universal Ostrich Farms Inc., Research Services Agreement, executed 2024 (contingent on access to recovered H5N1-exposed population).

[8] Adachi, K. et al., "Ostrich antibodies neutralize H5N1 influenza virus," Molecular Medicine Reports 1(3): 359-366 (2008); Kamiyama, T. et al., "Protection from H5N1 virus infection with antibody-impregnated filters," Virology Journal 8: 54 (2011).

[9] Dr. Steven Pelech, Reports dated January 29, February 12, April 1, and September 7, 2025. See specifically September 7, 2025 Report at pages 2-3 (antibody detection in 2024 samples); February 12, 2025 Report at page 8 (mortality patterns and herd immunity).

[10] Universal Ostrich Farms Inc. v. Canadian Food Inspection Agency, 2025 FCA 147 at para. 29.

[11] Canadian Food Inspection Agency, "Scrapie Pilot Project Announcement," August 13, 2025, available at www.inspection.gc.ca/scrapie-pilot.

[12] WOAH Terrestrial Code Ch. 1.4; WOAH Guide (2014); Cameron & Baldock (1998a,b), Prev. Vet. Med. 34:1-17 and 34:19-30.

[13] Universal Ostrich Farms Inc., Pond Drainage, January May 2025 (pond drained; designated for manure storage pending relocation of existing material).

[14] Canadian Food Inspection Agency, Quarantine Order BC-2024-12-28, December 28, 2024 (imposing movement restrictions; continuous compliance maintained).

[15] Universal Ostrich Farms Inc., Illness Monitoring Records, December 28, 2024 to September 9, 2025 (no illnesses recorded during 237-day period); Entry/Exit Logs for biosecurity compliance.

[16] WOAH Terrestrial Animal Health Code, Chapter 10.4, Article 10.4.6 (2024).

[17] Marimwe et al. (2021), Prev. Vet. Med. 196:105474 (two consecutive negative RT-PCRs 21 days apart). Note: van Helden et al. (2016) documents 2011 H5N2 outbreak controlled through depopulation.

[18] U.S. DHS Master Question List for HPAI (Aug 8, 2024): Depopulation/Carcass Disposal, p. 21; Virus Importation, p. 28.

[19] Universal Ostrich Farms Inc., Breeding Stock Invoice, 2024 ($7,500 for proven breeding ostrich).

[20] Economic Impact Calculation, September 2025 (385 birds × $7,500 = $2,887,500; research contracts $3,500,000; infrastructure $1,600,000; lost economic activity $2,102,000/year × 5 years = $10,510,000; total $18,497,500; statutory compensation $1,155,000 (6.2%)).

[21] Statistics Canada, Input-Output Multipliers, Provincial and Territorial, 2021, Catalogue no. 15-211-X (agricultural sector multipliers supporting approximately 85 job impact).

[22] Compensation for Destroyed Animals Regulations, SOR/2000-233, Schedule I, Part XII (maximum compensation $3,000 per ostrich).

[23] Universal Ostrich Farms Inc., 32-Year History, 1993-2025 (continuous ostrich farming operations demonstrating multi-generational genetic development).

[24] Statistics Canada, Input-Output Multipliers, Provincial and Territorial, 2021, Catalogue no. 15-211-X.

[25] Baker v. Canada (Minister of Citizenship and Immigration), [1999] 2 S.C.R. 817; Canada (Minister of Citizenship and Immigration) v. Vavilov, 2019 SCC 65.

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[27] Canadian Food Inspection Agency, Quarantine Order BC-2024-12-28, December 28, 2024 (imposing movement restrictions; continuous compliance maintained).

[28] Universal Ostrich Farms Inc., Current Flock Count, September 9, 2025 (385 surviving birds from approximately 450 original; 69 mortalities December 12, 2024 - January 15, 2025).

[29] Dr. Steven Pelech Reports, January 29, February 12, April 1, and September 7, 2025.

[30] Canadian Food Inspection Agency, Compliance and Enforcement Policy, November 1, 2020, RDIMS 11487825, Section 7.4

[31] Universal Ostrich Farms Inc. v. Canadian Food Inspection Agency, 2025 FCA 147 at para. 29.

[32] Doré v. Barreau du Québec, 2012 SCC 12.

[33] Cardinal v. Director of Kent Institution, [1985] 2 S.C.R. 643.

[34] Environment and Climate Change Canada, Monthly Climate Summaries, Fraser Valley Region, December 2024.

[35] Canadian Wildlife Health Cooperative, National Avian Influenza Surveillance Report, Q4 2024.

[36] Canadian Food Inspection Agency, Hazard Specific Plan for Highly Pathogenic Avian Influenza, Version 2.0, 2023.

[37] Dr. Steven Pelech, Report dated February 12, 2025, at paragraphs 50-60.

[38] Dr. Steven Pelech, Report dated April 1, 2025, at paragraphs 17-20, Exhibit B.

[39] Global Initiative on Sharing Avian Influenza Data (GISAID), EpiFlu Database, accessed September 7, 2025.

[40] Dr. Steven Pelech, Report dated January 29, 2025, at paragraphs 52-61.

[41] Stallknecht & Brown (2009) - persistence >1 year at 4°C possible; Nazir et al. (2010) - T-90 values by temperature.

[42] Dr. Steven Pelech, Curriculum Vitae, attached as Exhibit A to Report dated January 29, 2025; September 7, 2025 Report noting 36 years on UBC faculty.

[43] Dr. Steven Pelech, Report dated February 12, 2025, at page 8, proposing egg yolk antibody testing.

[44] Dr. Steven Pelech, Report dated September 7, 2025, at pages 2-3, confirming detection of H5 and N1 antibodies in 18 egg samples

[45] ibid., describing findings as "a strong indicator" of prior exposure.

[46] Ibid., at page 3, explaining 15% mortality versus expected 85% fatality rate.

[47] Dr. Steven Pelech, Report dated September 7, 2025, at page 3.

[48] Dr. Steven Pelech, Report dated February 12, 2025, at page 8.

[49] Ibid., referencing 2020 illness event as possible prior exposure.

[50] Ibid., at page 9.

[51] Dr. Steven Pelech, Report dated February 12, 2025, at page 7, citing ostrich-specific research.

[52] Dr. Steven Pelech, Report dated April 1, 2025, Exhibit B (CFIA internal memo on genomic sequencing).

[53] Ibid., at pages 4-5, discussing PB2-627E retention.

[54] Ibid., at page 5.

[55] Ibid., noting absence of D701N mutation.

[56] Ibid., at page 6.

[57] Dr. Steven Pelech, Report dated February 12, 2025, at page 6.

[58] Ibid., at page 7.

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[60] Ibid.

[61] Ibid., at page 8.

[62] Dr. Steven Pelech, Report dated September 7, 2025, at page 1.

[63] Dr. Steven Pelech, Report dated April 1, 2025, at page 7; Pauly et al. (2017) - mutation rates.

[64] Dr. Steven Pelech, Report dated February 12, 2025, at page 10.

[65] Ibid., at pages 7-8.

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[76] Agreement on the Application of Sanitary and Phytosanitary Measures, World Trade Organization, Article 3 and Annex A(3)(b).

[77] WOAH Terrestrial Animal Health Code, Chapter 10.4, Article 10.4.28.

[78] WOAH Guide to Terrestrial Animal Health Surveillance (2014); WOAH Surveillance Training Materials.

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[82] Western Cape Government, Department of Agriculture, "South Africa holds 75% of global ostrich market share," August 2019

[83] Western Cape Government, Department of Agriculture, "Collaboration with SA Ostrich Business Chamber on AI Protocol," Media Statement, November 2006

[84] U.S. Department of Agriculture, Animal and Plant Health Inspection Service, "HPAI Detection in Dairy Cattle," Stakeholder Announcement, March 25, 2024.

[85] USDA APHIS, Federal Order 2024-02, "Interstate Movement of Dairy Cattle," April 24, 2024.

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[94] Ibid., Section 7.5 (Results-oriented).

[95] Ibid., Section 7.2 (Fairness, predictability and consistency).

[96] Ibid., Section 7.3 (Transparency).

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[98] Ibid., Appendix A, page 9.

[99] Ibid., Section 1.0 (Background), page 3.

[100] Alberta Prion Research Institute Annual Report 2023-2024., s. 48.

[101] Maple Lodge Farms Ltd. v. Government of Canada, [1982] 2 S.C.R. 2.

[102] Baker v. Canada (Minister of Citizenship and Immigration), supra note 16.

CANADA

CONSOLIDATION

CODIFICATION

Health of Animals Act

Loi sur la santé des animaux

S.C. 1990, c. 21

L.C. 1990, ch. 21

Current to June 9, 2025

Last amended on January 15, 2019

À jour au 9 juin 2025

Dernière modification le 15 janvier 2019

Published by the Minister of Justice at the following address:
http://laws-lois.justice.gc.ca

Publié par le ministre de la Justice à l'adresse suivante :
http://lois-laws.justice.gc.ca

(c) any proceeds realized from its disposition under paragraph (b) or section 43 may be applied in payment of the penalty or fine.

1990, c. 21, s. 47; 1995, c. 40, s. 59; 2015, c. 2, s. 93.

c) le produit de l'aliénation prévue à l'alinéa b) ou à l'article 43 peut être affecté au paiement de la sanction ou de l'amende.

1990, ch. 21, art. 47; 1995, ch. 40, art. 59; 2015, ch. 2, art. 93.

Disposal and Treatment

Disposal of affected or contaminated animals and things

48 (1) The Minister may dispose of an animal or thing, or require its owner or any person having the possession, care or control of it to dispose of it, where the animal or thing

(a) is, or is suspected of being, affected or contaminated by a disease or toxic substance;

(b) has been in contact with or in close proximity to another animal or thing that was, or is suspected of having been, affected or contaminated by a disease or toxic substance at the time of contact or close proximity; or

(c) is, or is suspected of being, a vector, the causative agent of a disease or a toxic substance.

Treatment

(2) The Minister may treat any animal or thing described in subsection (1), or require its owner or the person having the possession, care or control of it to treat it or to have it treated, where the Minister considers that the treatment will be effective in eliminating or preventing the spread of the disease or toxic substance.

Notice

(3) A requirement under this section shall be communicated by personal delivery of a notice to the owner or person having the possession, care or control of the thing or by sending a notice to the owner or person, and the notice may specify the period within which and the manner in which the requirement is to be met.

1990, c. 21, s. 48; 2015, c. 3, s. 105(F).

Disposition et traitement

Mesures de disposition

48 (1) Le ministre peut prendre toute mesure de disposition, notamment de destruction, — ou ordonner à leur propriétaire, ou à la personne qui en a la possession, la responsabilité ou la charge des soins, de le faire — à l'égard des animaux ou choses qui :

a) soit sont contaminés par une maladie ou une substance toxique, ou soupçonnés de l'être;

b) soit ont été en contact avec des animaux ou choses de la catégorie visée à l'alinéa a) ou se sont trouvés dans leur voisinage immédiat;

c) soit sont des substances toxiques, des vecteurs ou des agents causant des maladies, ou sont soupçonnés d'en être.

Traitement

(2) Le ministre peut par ailleurs soumettre ces animaux ou choses à un traitement, ou ordonner à ces personnes de le faire ou d'y faire procéder, s'il estime que celui-ci sera efficace dans l'élimination de la maladie ou de la substance toxique ou la prévention de la propagation.

Avis

(3) L'ordre est signifié au propriétaire ou à la personne concernée, soit en mains propres, soit par envoi postal ou autre, sous forme d'avis en précisant éventuellement le délai ou les modalités d'exécution.

1990, ch. 21, art. 48; 2015, ch. 3, art. 105(F).

Samples

Disposition of samples

49 A sample taken under this Act or the regulations may be disposed of in such manner as the Minister considers appropriate.

Prélèvements

Réalisation

49 Il peut être disposé des prélèvements effectués au titre de la présente loi ou des règlements de la façon que le ministre juge indiquée.

CHAPTER 10.4.

INFECTION WITH HIGH PATHOGENICITY AVIAN INFLUENZA VIRUSES

Article 10.4.1.

General provisions

1) This chapter deals with the *listed disease*, *infection* with high pathogenicity avian influenza viruses.

2) For the purposes of the *Terrestrial Code*:

   a) High pathogenicity avian influenza means an *infection* of *poultry* by any influenza A virus that has been determined as high pathogenicity in accordance with the *Terrestrial Manual*.

   b) An occurrence of *infection* with a high pathogenicity avian influenza virus is defined by the isolation and identification of the virus or the detection of specific viral ribonucleic acid, in one or more samples from *poultry*.

   c) The *incubation period* at the *flock*-level for high pathogenicity avian influenza is 14 days.

3) Although the objective of this chapter is to mitigate animal and public health risks posed by *infection* with high pathogenicity avian influenza viruses, other influenza A viruses of avian host origin (i.e. low pathogenicity avian influenza viruses) may have the potential to exert a negative impact on animal and public health. A sudden and unexpected increase in virulence of low pathogenicity avian influenza viruses in *poultry* is notifiable as an *emerging disease* in accordance with Article 1.1.4. *Infection* of domestic and *captive wild* birds with low pathogenicity avian influenza viruses having proven natural transmission to humans associated with severe consequences, and *infection* of birds other than *poultry*, including *wild* birds, with influenza A viruses of high pathogenicity, are notifiable in accordance with Article 1.3.3.

4) A *notification* of *infection* of birds other than *poultry*, including *wild* birds, with influenza A viruses of high pathogenicity, or of *infection* of domestic or *captive wild* birds with low pathogenicity avian influenza viruses does not affect the high pathogenicity avian influenza status of the country or *zone*. A Member Country should not impose bans on the international trade of *poultry commodities* in response to such *notifications*, or to other information on the presence of any non-notifiable influenza A virus in birds.

5) This chapter includes *monitoring* considerations for low pathogenicity avian influenza viruses because some, especially H5 and H7 subtypes, have the potential to mutate into high pathogenicity avian influenza viruses.

6) The use of *vaccination* against avian influenza may be recommended under specific conditions. Any vaccine used should comply with the standards described in the *Terrestrial Manual*. *Vaccination* will not affect the high pathogenicity avian influenza status of a free country or *zone* if *surveillance* supports the absence of *infection*, in accordance with Article 10.4.28., in particular point 2. *Vaccination* can be used as an effective complementary control tool when a *stamping-out policy* alone is not sufficient. Whether to vaccinate or not should be decided by the *Veterinary Authority* on the basis of the avian influenza situation as well as the ability of the *Veterinary Services* to implement the *vaccination* strategy, as described in Chapter 4.18.

7) Standards for diagnostic tests and vaccines, including pathogenicity testing, are described in the *Terrestrial Manual*.

Article 10.4.2.

Safe commodities

When authorising importation or transit of the following *commodities*, *Veterinary Authorities* should not require any conditions related to high pathogenicity avian influenza, regardless of the high pathogenicity avian influenza status of the *exporting country* or *zone*:

1) heat-treated *poultry meat products* in a hermetically sealed container with an F_0 value of 3 or above;

2) extruded dry pet food and coated ingredients after extrusion;

3) rendered *protein meal*, blood meal, feather meal, and *poultry* oil;

4) washed and steam-dried feathers and down from *poultry* and other birds.

Article 10.4.24.

Procedures for the inactivation of high pathogenicity avian influenza viruses in meat products from poultry

The following time/temperature combinations are suitable for the inactivation of high pathogenicity avian influenza viruses in *meat products*.

	Core temperature (°C)	Time
Meat products from poultry	60.0	507 seconds
	65.0	42 seconds
	70.0	3.5 seconds
	73.9	0.51 second

These time/temperature combinations are indicative of a range that achieves a 7-$\log_{10}$ reduction of avian influenza virus infectivity. When supported by scientific evidence, variations of these time/temperature combinations may be used if they achieve equivalent inactivation of the virus.

Article 10.4.25.

Procedures for the inactivation of high pathogenicity avian influenza viruses in collection specimens and in skins and trophies

For the inactivation of high pathogenicity avian influenza viruses in collection specimens and in skins and trophies, one of the following procedures should be used:

1) boiling in water for an appropriate time to ensure that any material other than bone, claws or beaks is removed; or
2) soaking, with agitation, in a 4% (w/v) solution of washing soda (sodium carbonate-Na_2CO_3) maintained at pH 11.5 or above for at least 48 hours; or
3) soaking, with agitation, in a formic acid solution (100 kg salt [NaCl] and 12 kg formic acid per 1,000 litres water) maintained below pH 3.0 for at least 48 hours; wetting and dressing agents may be added; or
4) in the case of raw hides, treatment for at least 28 days with salt (NaCl) containing 2% washing soda (sodium carbonate-Na_2CO_3); or
5) treatment with 1% formalin for a minimum of six days; or
6) any equivalent treatment which has been demonstrated to inactivate the virus.

Article 10.4.26.

Principles of surveillance for avian influenza

The following are complementary to Chapter 1.4. and should be applied by Member Countries seeking to determine their high pathogenicity avian influenza status.

These principles are also necessary to support *vaccination* programmes, to monitor low pathogenicity avian influenza viruses, especially H5 and H7, in *poultry* and to detect high pathogenicity avian influenza in *wild* birds.

The impact and epidemiology of avian influenza differ widely among different regions of the world and therefore it is impossible to provide detailed recommendations for all situations. Variables such as the frequency of contacts between *poultry* and *wild* birds, different *biosecurity* levels and production systems, and the commingling of different susceptible species including domestic waterfowl, may require different *surveillance* strategies to address each situation. Furthermore, domestic waterfowl typically do not show clinical signs and have longer infective periods than gallinaceous *poultry*. It is therefore incumbent upon the Member Country to provide scientific data that explain the epidemiology of avian influenza in the region of concern and also to demonstrate how all the risk factors have been taken into account. Member Countries have flexibility to provide a science-based approach to demonstrate absence of *infection* with high pathogenicity avian influenza viruses at an appropriate level of confidence, as described in Chapter 1.4.

There is an increased recognition of the value of the application of sequencing technologies and phylogenetic analyses to determine routes of introduction, transmission pathways and epidemiological patterns of *infection*. When avian influenza viruses are detected, Member Countries should apply these technologies, when possible, to enhance the evidence used to develop specific *surveillance* strategies and control activities.

A *monitoring* system for low pathogenicity avian influenza viruses in *poultry* should be in place for the following reasons:

1) H5 and H7 low pathogenicity avian influenza viruses have the potential to mutate into high pathogenicity avian influenza viruses, but it is not possible to predict which viruses will mutate or when these mutations will occur.
2) The detection of sudden and unexpected increases in virulence of low pathogenicity avian influenza viruses in *poultry* is notifiable as an *emerging disease* in accordance with Article 1.1.4.
3) The detection, in domestic or *captive wild* birds, of low pathogenicity avian influenza viruses that have been proven to be transmitted naturally to humans with severe consequences is notifiable in accordance with Article 1.1.3.

Article 10.4.27.

Surveillance for early warning of high pathogenicity avian influenza

1) An ongoing *surveillance* programme for avian influenza should be in place and be designed to detect the presence of *infection* with high pathogenicity avian influenza viruses in the country or *zone* in a timely manner.
2) The high pathogenicity avian influenza *surveillance* programme should include the following.
   a) An *early warning system* for reporting suspected *cases*, in accordance with Article 1.4.5. throughout the production, marketing and processing chain. Farmers and workers who have day-to-day contact with *poultry*, as well as diagnosticians, should report promptly any suspicion of avian influenza to the *Veterinary Services*. All suspected *cases* of high pathogenicity avian influenza should be investigated immediately and samples should be collected and submitted to a *laboratory* for appropriate tests.
   b) Implementation, as relevant, of regular and frequent clinical inspection, or serological and virological testing of high-risk groups of *animals*, such as those adjacent to a country or *zone* infected with high pathogenicity avian influenza, places where birds and *poultry* of different origins are mixed, such as live bird markets, and *poultry* in close proximity to waterfowl or other potential sources of influenza A viruses. This activity is particularly applicable to domestic waterfowl, where detection of high pathogenicity avian influenza via clinical suspicion can be of low sensitivity.
   c) Immediate investigation of the presence of antibodies against influenza A viruses that have been detected in *poultry* and are not a consequence of *vaccination*. In the case of single or isolated serological positive results, *infection* with high pathogenicity avian influenza viruses may be ruled out on the basis of a thorough epidemiological and *laboratory* investigation that does not demonstrate further evidence of such an *infection*.

Article 10.4.28.

Surveillance for demonstrating freedom from infection with high pathogenicity avian influenza

1) A Member Country declaring freedom of the entire country, a *zone* or a *compartment* from high pathogenicity avian influenza in *poultry* should provide evidence of an effective *surveillance* programme.

   Transparency in the application of different methodologies is essential to ensure consistency in decision-making, ease of understanding, fairness and rationality. The assumptions made, the uncertainties, and the effect of these on the interpretation of the results, should be documented.

   The design of the *surveillance* programme will depend on the epidemiological circumstances and it should be planned and implemented in accordance with this chapter and Article 1.4.6.This requires the availability of demographic data on the *poultry* population and the support of a *laboratory* able to undertake identification of *infection* with avian influenza viruses through virus detection and antibody tests.

   The *surveillance* programme should demonstrate absence of *infection* with high pathogenicity avian influenza viruses during the preceding 12 months in susceptible *poultry* populations (vaccinated and non-vaccinated).

   The design of the sampling strategy should include an epidemiologically appropriate design prevalence. The design prevalence and desired level of confidence in the results will determine the sample size. The Member Country should justify the choice of design prevalence and confidence level used on the basis of the stated objectives of the *surveillance* and the epidemiological situation.

   The sampling strategy may be risk-based if scientific evidence is available, and provided, for the quantification of risk factors. Specific risks could include those linked to the types of production, possible direct or indirect contact

with *wild* birds, multi-age *flocks*, local trade patterns including live bird markets, use of possibly contaminated surface water, the presence of more than one species at the *establishment* and poor *biosecurity* in place.

Data from different *surveillance* activities can be included to increase the sensitivity of the *surveillance* system. If this is to be done, data from structured (e.g. surveys and active *surveillance*) and non-structured (e.g. passive *surveillance*) sources should be combined and the sensitivity of each activity should be quantified in order to be able to quantify the sensitivity of the overall *surveillance* system.

The *surveillance* programme should include *surveillance* for high pathogenicity avian influenza viruses in birds other than *poultry*, including *wild* birds, and *monitoring* of low pathogenicity avian influenza viruses in *poultry*, in order to ensure that *biosecurity* and control measures are fit for purpose.

Documentation of freedom from *infection* with high pathogenicity avian influenza should provide details of the *poultry* population, the occurrence of suspected *cases* and how they were investigated and dealt with. This should include the results of *laboratory* testing and the *biosecurity* and control measures to which the animals concerned were subjected during the investigation.

2. Additional requirements for countries, zones or compartments that practise vaccination

Vaccination to prevent the transmission of high pathogenicity avian influenza virus may be part of a disease control programme. The level of *flock* immunity required to prevent transmission depends on the *flock* size, composition (e.g. species) and density of the susceptible *poultry* population. Based on the epidemiology of avian influenza in the country, *zone* or *compartment*, a decision may be reached to vaccinate only certain species or other *poultry subpopulations*.

In all vaccinated *flocks* tests should be performed to ensure the absence of virus circulation. The tests should be repeated at a frequency that is proportionate to the *risk* in the country, *zone* or *compartment*. The use of sentinel *poultry* may provide further confidence in the absence of virus circulation.

Member Countries seeking the demonstration of freedom from high pathogenicity avian influenza in vaccinated population should refer to the chapter on avian influenza (*infection* with avian influenza viruses) in the *Terrestrial Manual*.

Evidence to show the effectiveness of the *vaccination* programme should also be provided.

3. Additional requirements for recovery of free status

In addition to the conditions described in the point above, a Member Country declaring that it has regained country, *zone* or *compartment* freedom after an *outbreak* of high pathogenicity avian influenza in *poultry* should show evidence of an active *surveillance* programme, depending on the epidemiological circumstances of the *outbreak*, to demonstrate the absence of the *infection*. This will require *surveillance* incorporating virus detection and antibody tests. The Member Country should report the results of an active *surveillance* programme in which the susceptible *poultry* population undergoes regular clinical examination and active *surveillance* planned and implemented according to the general conditions and methods described in these recommendations. The *surveillance* samples should be representative of *poultry populations* at risk. The use of sentinel birds may facilitate the interpretation of *surveillance* results.

Populations under this *surveillance* programme should include:

a) *establishments* in the proximity of the *outbreaks*;

b) *establishments* epidemiologically linked to the *outbreaks*;

c) *poultry* used to re-populate affected *establishments*;

d) any *establishments* where preventive depopulation has been carried out.

Article 10.4.29.

Surveillance of wild bird populations

Passive *surveillance*, i.e. sampling of birds found dead, is an appropriate method of *surveillance* in *wild* birds because *infection* with high pathogenicity avian influenza can be associated with mortality in some species. Mortality events, or clusters of birds found dead should be reported to the *Veterinary Services* and investigated, including through the collection and submission of samples to a *laboratory* for appropriate tests.

Active *surveillance*, i.e. sampling of live *wild* birds, may be necessary for detection of some strains of high pathogenicity avian influenza viruses that produce *infection* without mortality in *wild* birds. Furthermore, it increases knowledge of the ecology and evolution of avian influenza viruses.

Surveillance in *wild* birds should be targeted towards times of year, species and locations in which *infection* is more likely.

Surveillance in *wild* birds should be enhanced by raising awareness, and by active searching and *monitoring* for dead or moribund *wild* birds when high pathogenicity avian influenza has been detected in the region. The movements of migratory water birds, in particular ducks, geese and swans, should be taken into account as a potential pathway for introduction of virus to uninfected areas.

Article 10.4.30.

Monitoring of low pathogenicity avian influenza in poultry populations

Outbreaks of low pathogenicity avian influenza viruses can be managed at the *establishment* level; however, spread to other *poultry establishments* increases the risk of virus mutation, particularly if it is not detected and managed. Therefore, a *monitoring* system should be in place.

Monitoring the presence and types of low pathogenicity avian influenza viruses can be achieved through a combination of clinical investigation when *infection* is suspected because of changes in production parameters, such as reductions in egg production or *feed* and water intake, and active serological and virological *surveillance*, which can be supported by the information obtained by the *surveillance* system for high pathogenicity avian influenza.

Serological and virological *monitoring* should aim at detecting clusters of infected *flocks* to identify spread between *establishments*. Epidemiological follow-up (tracing forward and back) of serologically positive *flocks* should be carried out to determine whether there is clustering of infected *flocks* regardless of whether the seropositive birds are still present at the *establishment* or whether active virus *infection* has been detected. Hence, *monitoring* of low pathogenicity avian influenza will also enhance early detection of high pathogenicity avian influenza.

NB: FIRST ADOPTED IN 1998; MOST RECENT UPDATE ADOPTED IN 2024.

Terms of Struthio BioScience ("Struthio") and Ostrich Pharma KK ("OPKK") Agreement

This document contains the terms of an agreement that would be signed simultaneously with other agreements at the closing of an anticipated investment in Struthio that is satisfactory to OPKK.

Struthio name will be changed to Ostrich Pharma North America.

Struthio will receive an exclusive license to existing patents:

- For production and sale of IgY and products containing IgY outside of Japan
- Upfront payment of JPY 500 million to OPKK
- 4% royalties paid to OPKK on sales of IgY and Struthio products containing IgY

Struthio will have the right of first refusal on new patents with an additional upfront fee.

Technology transfer from OPKK to Struthio:

- OPKK will set up purification process in British Columbia
- OPKK will train Struthio staff on ELISA technique used by OPKK for quality control

OPKK will provide, where available and allowable:

- Test data and reports from experience with products sold in Japan
- Specification of formulations for these products.

Struthio will purchase material for ostrich vaccination from OPKK, the purchase price to be determined by OPKK's cost plus a 15 per cent fee.

Dr. Yasuhiro Tsukamoto will become co-CEO of Struthio and Chairman of the Board of Directors.

Agreed to: April 11th, 2024

Ostrich Pharma KK	Struthio BioScience	Struthio BioScience
Yasuhiro Tsukamoto	Karen Espersen	David Bilinski

Terms of Struthio BioScience Inc. (“Struthio”) and Universal Ostrich Farms Inc. (“UOF”) Agreement

This document contains the terms of an agreement concerning ostrich eggs produced after vaccination to hyperimmunize against various antigens (“IgY Ostrich Eggs”). An agreement based on these terms would be signed simultaneously with other agreements at the closing of an anticipated investment in Struthio that is satisfactory to OPKK and UOF.

Struthio has an exclusive arrangement with UOF to purchase all of the IgY Ostrich Eggs produced by UOF.

Struthio will have an exclusive arrangement with UOF for all of Struthio’s IgY supply requirements.

Struthio will:

- Provide all antigens to UOF at no charge.
- Purchase yolks of all IgY Ostrich Eggs for $500 US each.
- Pay in advance for 1.5 years production of IgY Ostrich Eggs by UOF

UOF will:

- Only use antigens supplied by Struthio
- Produce eggs for whatever IgY products are required
- Maintain all hens with good animal husbandry practices at all times
- Expand to meet demand for Struthio’s requirements with one year lead time notice.
- Deliver either frozen or freeze-dried yolks of IgY Ostrich Eggs to Struthio as required by Struthio’s production.

Agreed to: April 11th, 2024

Universal Ostrich Farms Inc	**Struthio BioScience Inc.**
Karen Espersen	Stuart G. Greenberg
Karen Espersen	Stuart Greenberg

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Development of neutralization antibodies against highly pathogenic H5N1 avian influenza virus using ostrich (*Struthio camelus*) yolk

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Received December 3, 2007; Accepted January 4, 2008

Abstract. The rapid outbreak of the highly pathogenic H5N1 avian influenza virus and its transmission to humans have induced world-wide fears of a new influenza pandemic. The most effective method for the reduction of the impact of such a pandemic would be prophylaxis with a safe and effective vaccine, as well as anti-viral materials. In this study, we generated the specific antibodies 'immunoglobulin yolk (IgY)' from ostrich eggs immunized with a full-length glycosylated recombinant H5 protein of the strain H5N1/Vietnam/1203/2004. Using this simple method, abundant specific antibody (about 200 g) against H5 was successfully produced by one female ostrich in a year. The IgY from the immunized ostrich eggs had strong reactivity to the H5N1 virus as well as to H5 proteins. Furthermore, the antibodies strongly inhibited cytopathic effects in MDCK cells and prevented the death of an embryonated chick after a viral inoculation, indicating strong neutralization activity against H5N1 infections. These findings suggest that the neutralization antibody produced by the H5-immunized ostrich is suitable for industrial purposes, such as the development of antibody-binding filters, which can be applied to a mask or to air-conditioners to prevent the influenza pandemic through antigen-antibody reactions. Of note, the mortality rate of chicks inoculated with the H5N1 virus was dramatically decreased with antibody injection. This indicates that ostrich IgY is a potentially effective therapeutic modality for H5N1 infection.

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Key words: antibody, influenza virus, H5N1, pandemic, ostrich, IgY

Introduction

Influenza is recognized as a zoonotic disease, with the most commonly affected animals being humans, pigs, horses and species of aquatic birds (1). Influenza viruses belong to the family *Orthomyxoviridae* and are divided into three types, A, B and C. A type viruses are responsible for major disease problems in humans as well as in avian species (2-4) and are further classified into subtypes on the basis of their antigenic properties, including hemagglutinin (HA) and neuraminidase on the viral particle. There is world-wide concern over the possibility of a new influenza pandemic, especially since the appearance of the highly pathogenic avian influenza viruses H5N1, which have the capacity for lethal infection in man. Since 1997, over 200 people have been infected with H5N1, resulting in a mortality rate of over 50% (5). In addition, the H5N1 virus has been able to spread by means of domestic and wild birds from Hong Kong, where it was first detected, across Asia, Africa, and into northern Europe. Should the H5N1 virus develop the ability to spread efficiently from man to man, there would be a high risk of worldwide pandemic causing considerable mortality and economic disruption (6). It has been discussed that the most effective method to reduce the impact of a pandemic would be prophylaxis with a safe and effective vaccine (6,7), as well as anti-viral materials including masks or facial tissues (8).

Antibodies are increasingly used for research, diagnosis and therapeutic purposes. However, antibodies from experimental mammals, including mice and rabbits, are not adapted for industrial use because of their high production cost. Of late, the avian egg as an antibody source has proven to be attractive for the non-invasive production of antibodies with applications in research, diagnosis and immunotherapy (9-11). In addition, the production of avian antibodies offers many advantages over mammalian antibodies in terms of their specificity for antigens, production cost and uses (9).

The predominant class of immunoglobulin in birds is immunoglobulin yolk (IgY), which is transferred from the serum to the yolk to confer passive immunity to the embryo (12). Although the IgY and IgG of mammals are functionally

equivalent, they differ with respect to certain physicochemical properties (13).

Recently, we developed a convenient method for the mass-production of antibodies using the female ostrich (*Struthio camelus*). The ostrich grows to up to 250 cm in height and 160 kg in weight, and has a life span of about 60 years. Its eggs weigh about 1.5 kg and are 30-fold bigger than chicken eggs. They can lay one hundred eggs every year. We can purify about 2 g of IgY per ostrich egg. Accordingly, about 200 g of IgY is obtained from only one ostrich in the course of a year. Recent developments in breeding have permitted low-cost egg production from the ostrich, because they can be fed the factory waste from bean sprout production. Accordingly, we strongly believe that the ostrich egg may provide an excellent source of antibody for industrial purposes (14).

In the present study, we tried to produce antibodies against H5N1 from ostrich eggs. The HA proteins of the influenza viruses were considered to be suitable antigens for the immunization of the ostrich for the following reasons: i) influenza virus entry is mediated by the receptor binding domain of HA, and adaptation of avian viruses to humans is associated with HA specificity, and ii) the blockage of HA antigens leads to inactivation of the viral infection to host cells. We herein show that a high amount of neutralizing antibody against H5N1 was generated by the ostrich using a simple and economical method, which may lead to the development of anti-viral materials against an influenza pandemic.

Materials and methods

Generation of antibodies against influenza virus HA antigens. A mixture of HA antigens from vaccine strains of the human influenza virus (H1N1/NewCaledonia/20/99, H3N2/Hiroshima/52/2005 and B/Malaysia) (The Kitasato Institute Research Center for Biologicals, Japan) were used as antigens for the immunization of the ostrich, as well as H5 recombinant protein (rH5) purified from insect cells transfected with baculovirus vector inserting H5 gene of H5N1/Vietman/1203/2004 (Protein Sciences, USA).

The laying ostriches were immunized intra-muscularly in the lumbar region at multiple sites with the mixture of HA (30 μg/bird) or rH5 (50 μg/bird) emulsified in Freund's complete adjuvant (FCA). The boosters were administered every other week with both the antigens in Freund's incomplete adjuvant (FIA). Eggs were collected daily from the initial immune day. The yolk was separated from the albumin using egg yolk separator, the volume of the yolk was recorded and it was later stored at -20˚C. Serum samples were also collected every week and stored at -20˚C.

The yolk was separated from the albumin of the eggs and diluted to 5-fold with TBS-buffer [0.02 M Tris/HCl (pH 7.5), 0.15 M NaCl], increased 1- to 10-fold with 30% dextran sulfate in TBS and 2- to 3-fold with 2.5 M $CaCl_2$ in TBS, then stored at 4˚C for at least 4 h. The supernatant containing IgY was collected by centrifugation (10000 x g at 4˚C for 15 min) and precipitated with 45% saturated ammonium sulfate. The solution was centrifuged again at 10000 x g at 4˚C for 15 min. The precipitate was then re-dissolved in TBS and dialyzed against PBS. Finally, the purified antibody solutions were verified by 10% SDS-PAGE under non-reducing or reducing conditions and stained with Coomassie Brilliant Blue (CBB).

Generation of rabbit polyclonal antibodies against ostrich IgY. An experimental rabbit (Japanese-White) was immunized subcutaneously in the lumbar region at multiple sites with purified ostrich IgY (50 μg/body) emulsified in FCA. The boosters were given every other week with the same antigen in FIA. At the hyper-immunized stage, confirmed by ELISA, the serum was collected and the IgG purified with protein G as a routine procedure. The purified antibody fractions were verified by 10% SDS-PAGE under non-reducing conditions and stained with CBB. Finally, the purified IgG was conjugated with horseradish peroxidase (HRP) or FITC using the appropriate labeling kits (Dojin, Japan), then used as a secondary antibody (14).

Western blot analysis. rH5 proteins were separated with 10% SDS-PAGE in reducing conditions and electroblotted onto a nitrocellulose membrane (Bio-Rad). The membrane was air dried for 5-10 min, then blocked with blocking reagent (2% skim-milk in PBS) at room temperature for 1 h. After washing with a washing buffer (0.01 M PBS, pH 7.4 with 0.05% Tween-20), the membrane was incubated with the ostrich IgY against rH5 (1:4000) in the same blocking buffer at room temperature for 1 h on a horizontal shaker. Next, the membrane was washed and incubated with 1:5000 dilutions in blocking buffer of HRP-conjugated rabbit IgG against ostrich IgY at room temperature for 1 h. After thorough washing, the membrane was placed in peroxidase chromogenic substrate solution (0.01 M PBS, pH 7.4 with 0.05% diaminobenzidine and 0.03% H_2O_2) for 5 min, then immersed in excess distilled water to stop the color development. Finally, the Western blot membrane was digitally recorded using a gel documentation system (Fujifilm, Japan).

Enzyme linked immunosorbant assay (ELISA) using ostrich IgY. Each well of polystyrene ELISA plates (Sumitomo Bakelite, Japan) was coated with 0.2 μg HA antigens or rH5 protein in phosphate-buffered saline (PBS) and the plate was incubated overnight at 4˚C. Each of the following incubation steps were preceded by washing the wells twice with PBS containing 0.05% Tween-20. The wells were blocked for non-specific binding by the addition of a commercial blocking buffer (DS Pharma Biomedical, Japan) and were incubated at 37˚C for 2 h. The serial dilutions of purified IgY were added vertically to the wells and kept for incubation at 37˚C for 1 h. HRP-conjugated rabbit IgG diluted (1:5000) in PBS was dispensed into each well. The plate was incubated for 1 h at 37˚C. Later, a substrate buffer containing TMB (Sumitomo Bakelite) was added to each well and kept for incubation at 37˚C for 15 min. The reaction was terminated by the addition of a stopping reagent (1.25 M sulfuric acid). The absorbance was recorded at 450 nm using the ELISA plate reader (DS Pharma Biomedical).

Viral infectivity ($TCID_{50}$ and EID_{50}) assays. The H5N1/Indonesian strain cloned from affected chickens was used throughout this study. The viral solutions were titered using a cell culture system (MDCK cells) onto 96-well microtiter

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mbryonated chick eggs by serial 10-fold dilutions of es as a routine procedure.

Immunocytochemistry. MDCK cells seeded at a density of $5x10^4$ on the well of the microtiter plate were infected with H5N1 virus ($100TCID_{50}$) for 2-3 days at 35˚C. The cultures showing cytopathic effect (CPE) were fixed with 10% buffered formalin for immunocytochemistry. After washing in PBS, the cells were incubated with the ostrich IgY (1:4000) against HA or rH5 for 1 h at 37˚C, and then incubated with FITC-conjugated rabbit IgG (1:4000) against ostrich IgY following a sufficient number of washes in PBS. Finally, the specific signal was observed under fluorescence microscopy.

Neutralization assays for H5N1 infection. For the standard neutralization assay on cell cultures, serial dilutions in 2-fold step ostrich IgY were mixed at a ratio of 1:1 with H5N1 virus ($100TCID_{50}$), incubated for 1 h at 37˚C, and then transferred to a microtiter plate with a MDCK monolayer. After 2-3 days incubation at 35˚C, the cultures were inspected for CPE. The neutralizing titer, expressed as the reciprocal of the IgY dilution at which virus growth is 50% inhibited, was calculated by the number of virus negative wells and the IgY dilution according to the report by Reed *et al* (15).

For the assay on the embryonated eggs, serial dilutions in a 4-fold step of ostrich IgY were mixed at a ratio of 1:1 with H5N1 virus ($100EID_{50}$), incubated for 1 h at 37˚C, and injected into the allantoic cavity of the embryonic chicken eggs (10 days). After 2-3 days incubation at 35˚C, the embryos were inspected for their death. The neutralizing titer, expressed as the reciprocal of the IgY dilution at which virus growth is 50% inhibited, was calculated by the number of survivors and the IgY dilution.

Antibody injection into H5N1-infected chicks. At 10 days of age, the chicks were intra-nasally inoculated with H5N1 virus at a dose of $10^{7.8}TCID_{50}$. They were injected intra-muscularly with PBS or preimmune IgY (10 µg/bird) or IgY against rH5 (10 µg/bird) at 1 h post-inoculation with H5N1. Then all chicks were boarded in individual cages in a BSL3 laboratory in Indonesia (Vaksindo Satwa Nusantara). At 5-days post-viral-challenge, the number of dead chicks was counted and the results were expressed as the mean of dead birds in each experimental group (over 4 individuals in each group).

Results

Ostrich antibodies against HA antigen of influenza viruses. The IgY from the immunized ostrich with influenza virus HA antigens was purified from the yolk and visualized by SDS-PAGE. The molecular weight of ostrich IgY is around 200 kDa (heavy chain, 64 kDa; light chain, 28 kDa) and is heavier than that of rabbit IgG (Fig. 1). In a Western blot analysis, using a lysate of H5N1, the purified IgY from the rH5-immunized ostrich recognized the doublet bands of 45 and 25 kDa, corresponding to HA_1 and HA_2 of the H5 antigens, respectively (16) (Fig. 2). This indicated that the antibody against the H5 antigen of H5N1 was generated in the ostrich eggs.

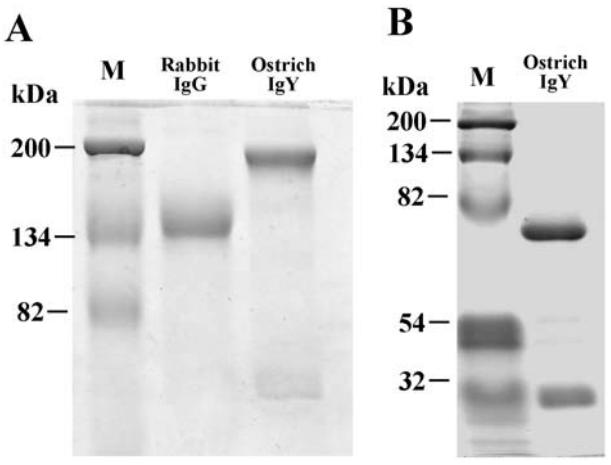

Figure 1. SDS-PAGE analysis of rabbit IgG and ostrich IgY. (A) Molecular weight of Rabbit IgG and ostrich IgY. Purified rabbit IgG and ostrich IgY were loaded under non-reducing conditions. The intact ostrich IgY is around 200 kDa - heavier than rabbit IgG, which is about 150 kDa. A faint band under 82 kDa in the ostrich IgY sample seems to be a heavy chain of IgY. (B) The heavy and light chains of ostrich IgY. The samples were heated at 95˚C for 2 min under reducing conditions. The doublet bands of 64 and 28 kDa correspond to a heavy and light chain of IgY, respectively. M, molecular weight marker.

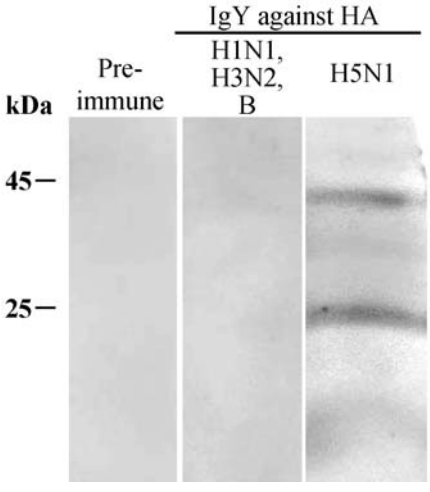

Figure 2. Western blot analysis of the HA antigen of the H5N1 virus. The reaction of ostrich antibodies to baculovirus-derived H5 recombinant protein (rH5) was examined by Western blotting. The HA (45 kDa) and HA2 (25 kDa) proteins were strongly recognized by the IgY from rH5 immunized ostrich and slightly by HA (H1, H2, B) immunized ostrich. In contrast, no reaction was found by preimmune IgY.

The IgY against each HA antigen was titered by ELISA in time course from the primary immunization day. The titers were increased dramatically in both serum and yolk from 2 weeks after the primary immunization time and reached the maximal peak at 8 weeks (data not shown). At the hyper-immune stage from 8 weeks on, about 2 g of IgY could be purified from one egg, indicating that it is possible to collect 200 g of IgY against the influenza virus from one female ostrich in one year. The ELISA titers of IgY against HA antigens are shown in Table I. The IgY from eggs immunized with HA-mixtures of antigens from the vaccine strains showed high reactivity to H1N1, H3N2 and B strains, but reacted

Table I. ELISA titers of ostrich IgY against influenza viruses HA antigens.

Antibodies against indicated HA antigens	Concentration (mg/ml)	Reciprocal IgY titer against indicated influenza virus HA antigens			
		H1N3	H3N2	B	H5N1
H1, H3, B	2	102400	204800	102400	3200
rH5	2	800	1600	800	51200

The IgY activities to each HA antigens of influenza viruses were measured by ELISA. The antibody titer was defined as the reciprocal of the highest IgY dilutions that produced an ELISA signal twice as intense as the signal from equivalently diluted preimmune IgY.

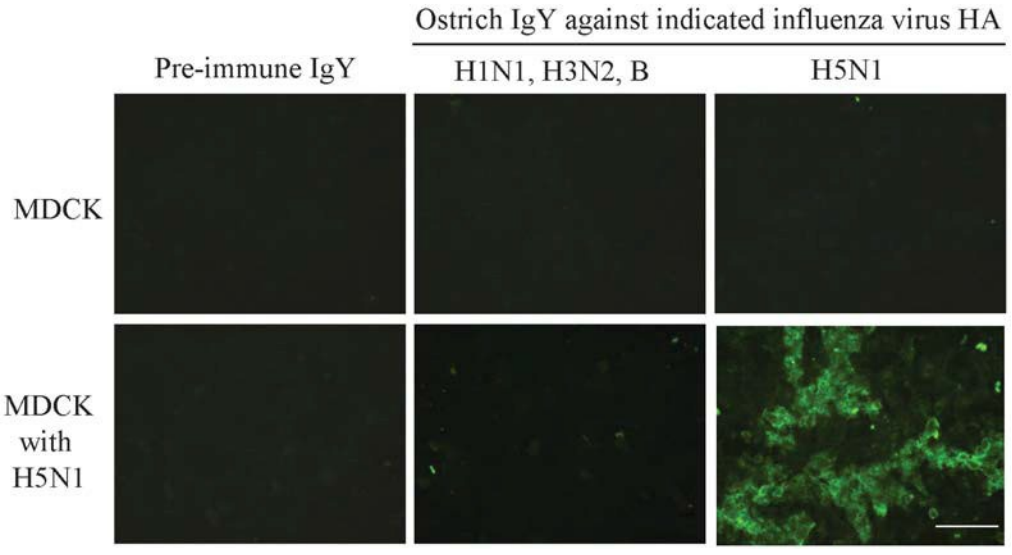

Figure 3. Immunocytochemistry of H5N1-infected MDCK cells. MDCK cells were reacted with ostrich IgY, and visualized by FITC-conjugated secondary antibody. Normal MDCK cells have no immunoreactivity to all antibodies. The H5N1-infected cells are not stained with preimmune IgY. In contrast, the cytoplasm of infected cells are stained strongly with the IgY from H5 immunized ostrich, but only slight with IgY from mixed HA (H1, H3, B) immunized bird. Bar, 50 μm.

more weakly to the H5N1 strain. In contrast, IgY from rH5-immunized eggs reacted strongly to H5N1, but only weakly to the H1N1, H3N2 and B strains.

Next, the reactivity of ostrich IgY was examined in immunocytochemistry. MDCK cells were infected with the Indonesia strain of H5N1 and stained with antibodies. The cytoplasm of infected cells was strongly labeled with IgY from rH5-immune eggs, but not with pre-immune IgY (Fig. 3). In contrast, IgY from eggs immunized with HA from the vaccine strains showed only weak immunoreactivity to the H5N1-infected cells.

These results indicate that high titers of antibodies against the H5N1 virus are collected from eggs immunized with H5 antigens. For this reason, antibodies from the H5-hyperimmune eggs were used for further examinations.

Neutralization assays for H5N1 infection. MDCK cells and embryonated eggs were used for the neutralization assays. The H5N1 virus was reacted with serial dilutions of IgY from preimmune or rH5-immunized eggs, and neutralization was determined by the observation of CPE and embryonic death. IgY with rH5-immunization showed very strong inhibitory effects on H5N1 infection in either MDCK or chick embryos (Fig. 4 and Table II). In contrast, H5N1 infection was not blocked in either of the analyses, even at the highest concentrations of preimmune IgY, indicating no neutralization activity on the H5N1 infection.

Effect of ostrich IgY on H5N1-infected chicks. The inhibitory activity of IgY from rH5-immunized ostrich was examined in H5N1-infected chicks in order to elucidate the potential therapeutic uses of ostrich IgY.

A high dosage of the H5N1 Indonesian strain ($10^{7.9}TCID_{50}$) was intra-nasally challenged to 10-day-old chicks. All the birds (100%) died by 5-days post-inoculation and experienced severe clinical symptoms including dehydration and depression. In contrast, the mortality rate of the infected birds was dramatically decreased by the intra-muscular injection with anti-H5 IgY: only 25% of the birds died by viral infection, and the survivors had no symptoms (Fig. 5). All infected birds died when the preimmune IgY was injected instead of the rH5-immune antibody. Accordingly, the anti-H5 IgY had a therapeutic effect on H5N1-infected chickens, even at the low dosage.

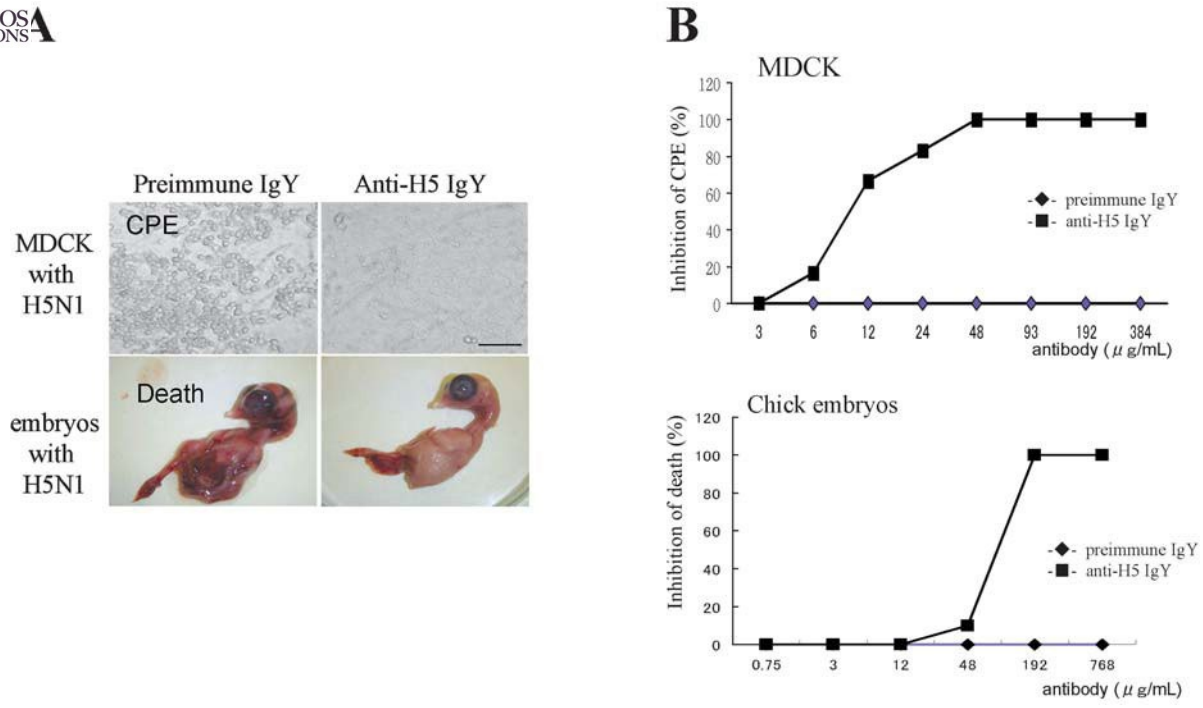

Figure 4. Neutralization activities on ostrich IgY for H5N1 infection. (A) MDCK cells infected with H5N1 virus show severe CPE on their monolayer sheet. IgY from H5 immunized ostrich (anti-H5 IgY) inhibit CPE, while preimmune IgY has no effect on the cells. Bar, 50 μm. (B) Neutralization activities of ostrich IgY on H5N1 infection were analyzed using MDCK cells and embryonated chick embryos. Anti-H5 IgY shows inhibitory activities on H5N1 infection in both MDCK and chick embryos, while preimmune IgY has no effect, even at the highest dosage.

Table II. Neutralizing titers of ostrich IgY against H5N1 strain.

Antibodies against indicated HA antigens	Neutralizing titers (50% inhibition)	
	MDCK cells (μg/ml)	Embryonic eggs (μg/ml)
Preimmune IgY	>384	>768
rH5	6.7	63.4

The neutralization assays were performed using MDCK cells and chick embryos. The neutralizing titers are indicated as the 50% inhibition on CPE or embryonic death.

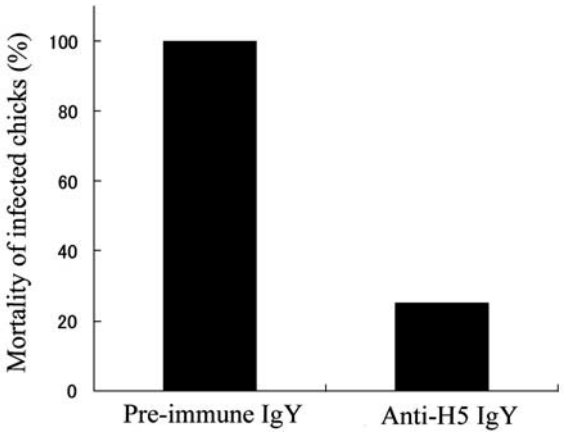

Figure 5. Effects of ostrich IgY on H5N1-infected chicks. The chicks were intra-nasally challenged with high titered H5N1 virus and infected with ostrich IgY. The dead chicks were counted at 5 days post-viral-inoculation and the mortality rate was calculated. All of infected birds died by 5 days, and preimmune IgY had no inhibitory effect on mortality. In contrast, the mortality of infected chicks was remarkably decreased by an injection with IgY from H5-immunized ostrich (anti-H5 IgY).

Discussion

In the present study, large-scale and economical antibodies against the highly pathogenic avian influenza virus H5N1 were generated by employing the female ostrich. To do so, HA antigens were immunized to obtain neutralization antibodies. Since HA binds to the receptors and is essential for viral entrance into the host cells, these antigens are widely used in the vaccine for influenza (17,18). Recently, various attempts have been made to prevent H5N1 pandemic infections (7,19,20). H5 antigens are used to develop vaccines against H5N1, and therapeutic monoclonal antibodies by H5 vaccinations can be evaluated before the emergence of human-adapted H5N1 strains (19,21).

The HA antigens were also highly antigenic in the ostrich; we could obtain ample IgY from the female birds by immunizing them with the HA antigens of the human influenza vaccine strains of H1N1, H3N2, B and the highly pathogenic avian influenza virus H5N1. Since ostrich IgY are polyclonal, the antibodies generated with the HA of the human vaccine strains are slightly reactive to H5, which are likely to be raised from the homology of epitopes among these antigens.

We used the IgY from the rH5-immunized ostrich for neutralization and therapeutic assays against H5N1 infections,

because this antibody had a much higher titer on the H5 antigen in comparison to other antibodies with human vaccine strains. In addition, rH5-immunized IgY was highly reactive to the H5N1-infected MDCK cells in immunocytochemistry. Therefore, this rH5-immunized IgY might be developed as a diagnostic tool for the H5 virus. In an ELISA against the H5 antigen, the titer of rH5-immunized IgY reached maximum levels at 8 weeks post initial immunization in the serum and yolk. The antibodies were successfully transferred from blood to yolk, which can then be non-invasively obtained by simple collection of the eggs, making it possible to obtain a high amount of anti-H5N1 antibody (200 g in total) from one female ostrich in a year. In neutralization assays, rH5-immunized IgY could inhibit H5N1 infection successfully in either MDCK cells or embryonic eggs. The H5N1 virus is highly virulent to chick embryos and it is difficult to protect them from virus infection using antibodies. However, in the present study ostrich IgY could inhibit H5N1 infection even in the embryos, although the volume of antibodies needed for viral protection was larger in embryos than in MDCK cells.

For the protection of poultry, neutralizing antibodies to HA and neuraminidase proteins have been reported to provide primary protection against the highly pathogenic avian influenza (22). In addition, the prophylactic and therapeutic efficacy of human monoclonal antibodies was elucidated by the H5N1 infections (21). One particularly interesting and potentially important finding of the present study was the observation that the chicks were protected by a low dosage of H5 immunized IgY from the H5N1 infection. This finding leads to the potential development of ostrich IgY for therapeutic treatment against an H5N1 pandemic. For the protection of poultry, a neutralizing antibody to the hemagglutinin and neuraminidase proteins provides the primary protection against the highly pathogenic avian influenza. It has been reported that chicken IgY has been used for therapeutic purposes: IgY preparations are administrated to patients suffering from infectious diseases including rotaviruses, enterotoxigenic *Escherichia coli*, coronavirus, *Salmonella spp.*, *Edwardsiella tarda*, *Yersinia ruckeri*, *Staphilococcus* and *Pseudomonas* (23,24). Therefore, we believe that ostrich IgY is a promising alternative to antibiotics for passive immunotherapy application as well as for chicken antibody.

Because most of the human population has no immunity to H5N1, the most effective method for the reduction of the impact of a pandemic has been reported to be prophylaxis with a safe and effective vaccine (6). In addition, anti-viral materials are recommended for the prevention of an influenza pandemic (8). In this study, a large amount of neutralization antibodies against H5N1 were produced with cost effectiveness, which indicates the potential use of ostrich antibody for industrial purposes, thus including the development of anti-viral materials. It is speculated that the IgY on the filters can capture the viral particles of H5N1 by antigen-antibody reactions, so the virus would be trapped by the filters and not pass through them. In addition, the virus might be neutralized on the filters, because HA is masked with IgY and cannot enter host cells. In the preliminary study, we found that the infectivity of H5N1 was dramatically decreased by the filters adsorpted with ostrich IgY generated by H5 immunizations (data not shown). We are now attempting to apply the ostrich IgY onto masks of either the N95 or surgical type to protect humans from an influenza pandemic caused by the H5N1 virus. In the event of such a pandemic, where effective vaccine and antiviral medicines may be lacking, disrupting the environmental transmission of the H5N1 virus will be the only viable strategy for the protection of the people. We believe that filters impregnated with ostrich antibodies will be a powerful tool for protection against the influenza pandemic.

Acknowledgements

The authors thank Drs Saeko Morikawa, Satoshi Hiroi, Takahiro Yumisashi and Tetsuo Kase at the Osaka Prefectural Institute of Public Health for their helpful comments. This study was supported in part by Research Fellowships from the Japan Society for the Promotion of Science (Nos. 17688013 and 18658115) and by an innovation grant from the Japan Science and Technology Agency (JST; No. 1804).

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VIROLOGY JOURNAL

SHORT REPORT Open Access

Protection from avian influenza H5N1 virus infection with antibody-impregnated filters

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Abstract

There is worldwide concern over the possibility of a new influenza pandemic originating from the highly pathogenic avian H5N1 influenza viruses. We herein demonstrate that functional air filters impregnated with ostrich antibodies against the hemagglutinin of the H5N1 virus protect chickens from death by H5N1 transmission. These results suggest that the use of ostrich antibody-impregnated filters might be a powerful way to prevent the transmission of H5N1.

Findings

The highly pathogenic avian influenza H5N1 viruses can spread by transmission between domestic and wild birds from Hong Kong, where it was first detected, across Asia, Africa, and into northern Europe [1,2]. Should the H5N1 virus develop the ability to spread efficiently between humans, there would be a high risk of a worldwide pandemic, causing considerable mortality and economic disruption [3-5]. Vaccination is a mainstay of influenza prevention, with annual vaccination recommended for adults and children at a high risk for infection; efforts to prevent person-to-person transmission are also important [3-6]. It has been recommended that health-care facilities implement a universal respiratory hygiene strategy [7,8].

There is an increasing use of antibodies for research, diagnosis, and therapeutic purposes. However, the antibodies from experimental mammals, including the mouse and rabbit, are not well-adapted for industrial usage because of their high production costs. Recently, we have developed a convenient method for the mass-production of antibodies by using ostrich (*Struthio camelus*) eggs [9]. Therefore, it is strongly believed that the ostrich egg may be an excellent antibody source for industrial and medical purposes. Previously, we succeeded in the mass production of ostrich antibodies against the highly pathogenic avian H5N1 influenza virus by immunization of the ostrich layers with viral hemagglutinin (HA). The antibodies have strong neutralization activities against H5N1 infectivities, and the lethality of H5N1 infected birds was dramatically decreased by the direct injection of ostrich antibodies [9]. In the present study, we focused on the application of ostrich antibodies against H5N1 infection. Because the influenza is transmitted by droplet infection [10], air-purification is one of the major factors in preventing influenza viral transmission among individuals. Therefore, we developed a functional air-purification filter coated with anti-influenza antibodies, and examined whether these filters decreased the risk of infection in patients. We herein show that the filters impregnated with ostrich antibodies against HA antigens inhibit the transmission of the H5N1avian influenza virus.

We previously developed a functional air filter impregnated with ostrich antibodies against various influenza viruses, including H5N1 (*Fujifilm Corporation, Japan*), and have confirmed that viruses trapped in the filters were effectively inactivated by an antigen-antibody reaction; the infectivities of H5N1 to canine culture cells (MDCK) were drastically inhibited after passing through the antibody filters. In addition, we confirmed that the antibody on a solid surface specifically reacted with a protein antigen supplied from a gas phase under the nominal ambient condition, by using FRET (fluorescence resonance energy transfer) signal as a mean to quantify the reaction between pairs of antibody labeled with a donor fluorophore and antigen labeled with an

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acceptance fluorophore [11]. In the present study, a convenient model for droplet- or fecal infection of influenza viruses was used. Boxes (12 × 16 × 30 cm) composed of coarse mesh- or antibody-impregnated or untreated filters were set up. Each box has three openings, of which total area is 388 cm^2, on both flanks and ceiling. The effective amount of the ostrich antibody impregnated in the nonwoven fabric filter coping with H5N1 is ca. 175 μg per the box. Normal white leghorn chicks were housed in these filter covered boxes with food and water. Chicks at 10 days of age were intranasally inoculated with avian influenza virus A/Bogor 2/IPB/H5N1 at a dose of 10^5 $TCID_{50}$, and were then housed around the filter covered boxes including non-inoculated chicks. At 6 days post-inoculation, the mortality of chicks in the filter covered boxes was calculated. The survivors were sacrificed with a pentobarbital solution, and the lungs were removed and fixed in buffered formalin for the histopathological and immunohistochemical analyses of viral infection.

Most of the surrounding H5N1-inoculated birds died at 3 days post-inoculation. As shown in Table 1 all birds escaped from death when they were housed in antibody-filter covered boxes, whereas the mortality of the birds in coarse mesh- and untreated-filter covered boxes was significantly higher. Histopathology and immunohistochemistry experiments revealed that severe inflammation and viral antigens were present even in the survivors in both coarse mesh- and untreated-filter covered boxes; in contrast, no obvious reactions were present in any chicks that were contained in the antibody filter covered boxes (Figure 1). These findings suggested that the antibody filters rescued the chicks from the viral transmission by H5N1-infected birds. Accordingly, the H5N1 viruses via droplet or fecal infections [12] from infected birds might be neutralized on the filters, because the HA of viruses was masked with ostrich antibodies, and could not enter the host cells; the viral particles from the filter had no infectivity in the animals. The avian influenza virus is highly infectious to the chickens compared to humans because of the distributions of receptor on host cells [13,14]. Due to the fact that the complete inhibition of H5N1 transmission was found in the present chick experiment, similar effects may therefore be observed in human cases. For this

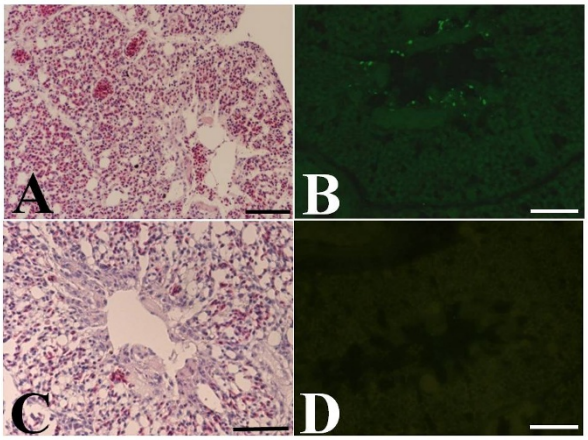

Figure 1 Histopathology and immunohistochemistry examination of H5N1 antigens. The survival chicks were sacrificed, and the lungs were removed and fixed in buffered formalin. Hematoxylin and eosin staining were performed on paraffin sections as previously described. For the immunohistochemical analyses, a monoclonal antibody against influenza A was incubated on the sections. A FITC-conjugated secondary antibody was incubated. Severe inflammation (A) and viral antigens (B) were observed in the lung of chicks housed in the untreated-filter box. In contrast, obvious histopathological legions (C) and viral antigens (D) were not detected in the lungs of chicks housed in antibody filter boxes. Scale bars represent *100 μm*.

Table 1 Mortality and infection rate

Type of partition	Number of chicks	Number of deaths						Toal number of deaths	Mortality	dead or infected	Infection ratio	Filter covered box		
		day 1	day 2	day 3	day 4	day 5	day 6					Number of box	Number of infected box	Infection rate (%)
(a) Mesh filter	24	0	0	0	0	5	18	23	96%	24	100%	6	6	100
(b) Untreated filter	20	0	1*	0	0	0	7	7	37%	15	79%	5	5	100
(c) Antibody filter	20	0	0	0	0	0	0	0	0%	0	0%	5	0	0
Inoculated chicks	48	0	0	42	6	0	0	48	100%	-	-	-	-	-

(a) polypropylene net with 3.7 mm square mesh-, or (b) untreated nonwoven fabric middle efficiency dust filter-, or (c) antibody impregnated same grade filter as (b), were attached to the three sides of the box cages (12 × 16 × 30 cm). Four male chickens weighing 80 g (10 days of age) were housed with food and water in each box cage covered with net or filter. Other chicks were intranasally inoculated with Highly Pathogenic Influenza virus A/Bogor 2/IPB/H5N1 (10^5TCID_{50}/bird). Three infected chicks were housed with food and water at the central area, closely surrounded by the filter boxes. Most of infected chicks at the central area died at 3 days post viral inoculation. At day 6, the surviving chicks in filter partitioned boxes were counted, and the mortality was calculated. In the histopathological and immunohistockemical analyses, the lungs of chicks were examined, and the box with at least one infected chick was scored as an infected box. * Since one chick in the untreatd filter box died in accidentally, the mortality and infection rate were calculated without this accidental case.

The basic specification of the nonwoven fabric middle efficiency dust filter used in (b) and (c) is as follows; average thickness: 0.8 mm ± 0.1 mm, average arrestance: ≧70% according to JIS Z 8901 gravitational method, initial pressure loss: 25 Pa @LV 0.5 m/s.

reason, antibody filters will likely be a powerful tool for protection against avian influenza transmission.

Acknowledgements
This work was supported in part by an innovation grant from JST Japan (to Y.T.). The experiments were approved by the animal care and use committee for Fujifilm, and the animal care committee of Kyoto Prefecture University.

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Authors' contributions
YT designed research; KA, EH, RDS, TK, MI, MT performed research; YK, YT and SK analyzed data and wrote the paper. All authors read and approved the final manuscript.

Competing interests
The authors declare that they have no competing interests.

Received: 7 October 2010 Accepted: 8 February 2011
Published: 8 February 2011

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doi:10.1186/1743-422X-8-54
Cite this article as: Kamiyama *et al.*: Protection from avian influenza H5N1 virus infection with antibody-impregnated filters. *Virology Journal* 2011 **8**:54.

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THE UNIVERSITY OF BRITISH COLUMBIA

This is Exhibit "A" referred to in the affidavit of Dr. Steven Pelech sworn before me at Vancouver this 30 day of January 20 25

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Date: 29 January 2025

Re: Expert Report – Risk of H5N1 influenza transmission from Ostriches located at Universal Ostrich Farms, Ltd.

For the case involving Universal Ostrich Farms Ltd. represented by Mr. Michael Carter of Cleveland & Doan Barristers & Solicitors

PART 1: DESCRIPTION OF SCOPE OF THE QUESTIONS TO BE ADDRESSED

1. I was asked by the firm of Cleveland & Doan to provide my expert opinion related to the flock of ostriches (Herd) located at the Universal Ostrich Farms Ltd. (UOF) near Edgewood, B.C. and the risks of transmission of the H5N1 strain of influenza, which is responsible for the current waves of avian flu. In addition, I was also requested to comment upon the value and applications of these birds with respect to the advancement of biomedical knowledge and production of diagnostics, vaccines and therapeutics.

2. In particular, in correspondence (Exhibit A) that I received in an e-mail from Mr. Carter on January 27th, 2025, I was requested to address the followings questions:

   i. What is the likelihood that the Herd presently is transmissible for H5N1 to each other and wild migratory birds such as ducks?

   ii. If the Herd has achieved herd immunity, is there anything rare and valuable about the Herd that would promote the advancement of biomedical research?

   iii. Is there any risk of transmitting the H5N1 virus from the yolk of the ostrich eggs if they were used for testing and research purposes?

iv. Would the testing for antibodies against the H5N1 virus from the egg yolks be a good measure of natural or vaccine-induced immunity?

v. Is there any evidence that vaccine-induced immunity for influenza is superior to natural immunity following recovery from an influenza infection?

3. I understand that having been named as an expert witness by Universal Ostrich Farms Ltd., and having read the Code of Conduct for Expert Witnesses set out in the schedule to the Federal Court Rules, that I am bound to these rules, including in the preparation of this report (see Exhibit B).

PART 2: COLLECTION OF FACTS IN THE PREPARATION OF THIS EXPERT REPORT

4. My opinion on these matters is informed in part on the following facts that were conveyed in Mr. Carter on January 27th, 2025 correspondence listed below:

i. Universal Ostrich Farms Ltd. ("UOF") is located at 301 Langille Road, Edgewood, British Columbia (the "Property").

ii. The Property is approximately 10 kilometres northwest of Edgewood, British Columbia.

iii. According to Statistics Canada, the 2021 Census Profile of Edgewood lists a total population of 235 people.

iv. The nearest population centres are Vernon, at over 90 kilometres by air, and Castlegar, at over 70 kilometres by air.

v. UOF raises ostriches at the Property.

vi. As of February 2020 UOF was raising about 250 ostriches on the Property.

vii. At that time some ostriches in the herd became sick. Tissue samples were taken from a deceased ostrich and were sent for analysis. A report from the BC Animal Health Centre returned positive results for "Proteus sp., *Pseudomonas aeruginosa* and *E. coli* (non-haemolytic)."

viii. Ten ostriches died around February 2020.

ix. In the following year UOF began increasing the size of the herd, including by purchasing some ostriches from other producers.

x. As of December 1, 2024 there were approximately 450 ostriches being raised at the Property (the "Herd").

xi. On about December 10, 2024 representatives from UOF began noticing some ostriches in the Herd were showing signs of illness.

xii In the following week ostriches began to die from apparent illness.

xiii. On December 29, 2024 representatives from the Canadian Food Inspection Agency ("CFIA") attended at the Property and took swab samples from two of the dead ostriches.

xiv. CFIA tested using the Avian Influenza matrix and H5H7 PCR test, and the test result was positive for the H5N1 type of Avian Influenza.

xv. On December 30, 2024 CFIA issued a written Requirement to Quarantine, which was amended on January 2, 2025, January 12, 2025 and January 24, 2025.

xvi. UOF has been complying with the requirements of the quarantine.

xvii. Between about December 12, 2024 and January 15, 2025, 69 ostriches died of the H5N1 type symptoms.

xviii. No ostriches have died of H5N1 symptoms since January 15, 2025.

xix. The only ostriches of the Herd that died of H5N1 type symptoms belonged to the group of ostriches that did not experience the pseudomonas infection in 2020.

xx. Four ostriches have died of non-H5N1 type symptoms in January 2025. Three of these ostriches slipped on the ice and injured themselves, and one ostrich was caught in a fence.

5. In addition to these facts, I have viewed several media interviews[1,2,3] with Ms. Katie Pasitney, who is the daughter of one of the owner of the UOF, and this has further informed me regarding their history and the use of these ostriches for biomedical research.

6. My own training in immunology and virology and personal experience and understanding of these fields affords me the ability to consider and weigh these issues in a knowledgeable way and offer a qualified expert opinion.

7. I have been actively involved in the study of coronaviruses for over 5 years, especially with respect to the SARS-CoV-2 virus, which is responsible for COVID-19, and the production of antibodies against this virus in people who have been infected by this virus and/or have been vaccinated against this virus. I have been involved in the development of serological tests for SARS-CoV-2 directed antibodies, and the application of these tests to evaluate natural and COVID-19 vaccine-induced immunity in a 4,500-person clinical study. My experience with SARS-CoV-2 is very applicable to influenza, which is caused by a similar respiratory virus. In Part 5 of my report, I will further elaborate on my experience in immunology and viral research to further establish my expertise in the matters under discussion.

8. Throughout this report, I have identified many of the key primary publications in the scientific literature and government websites as well as my own research that have influenced my conclusions about testing for the influenza virus, and the immune responses that the virus and influenza vaccines evoke.

9. The Canadian Food Inspection Agency has adopted a policy to test sick flocks of domesticated birds for the H5N1 influenza virus, and eradicate all the birds in the flock upon confirmation of an influenza infection. They have largely discounted the extent and effectiveness of natural immunity in the birds that have recovered to prevent future infections, and downplayed the

[1] https://www.ctvnews.ca/vancouver/article/bc-farm-fights-order-to-cull-ostrich-herd-after-2-birds-test-positive-for-avian-flu/

[2] https://www.rebelnews.com/power_hungry_feds_order_culling_of_ostrich_farm?utm_campaign=dh_ostrichupdate_012725&utm

[3] https://www.youtube.com/live/dM5xHTKSzV0

important role that serological testing for influenza virus antibodies has in tracking and controlling the avian flu pandemic to allow the Canadian livestock industry to move back towards normalcy. Wild birds, particularly migratory ducks, are commonly infected with the H5N1 strain of influenza, which produces a more virulent infection that can be lethal to birds. Therefore, it is likely that there will continue to be a high risk for future infections of domesticated birds and other livestock, especially if they have no previous immunity to the virus and there is no herd immunity established in the livestock. Various H5N1 influenza vaccine are currently in development to protect bird and other domesticated animals and people.[4] However, the influenza vaccines with attenuated, weakened forms of the virus have actually not been particularly efficacious in the past.

10. In Part 3 of my report, I will provide some background information about the influenza virus, testing for the virus and antibodies against this virus, and then in Part 4 specifically address the questions put forth by the firm of Cleveland & Doan.

PART 3 – BACKGROUND REVIEW OF INFLUENZA, NATURAL AND VACCINE INDUCED IMMUNITY

3.1. Viral Respiratory Diseases

11. Many human and animal infectious diseases are caused by airborne viruses. Notably, these include respiratory syncytial virus (RSV), influenza and coronaviruses. These viruses are highly contagious, mainly transmitted in aerosols received through the mouths and noses of victims. They produce very similar symptoms, which include runny nose, coughing, sneezing, wheezing, fever and decrease in appetite. The symptoms are largely consequences of the body's counter-reactions to a respiratory infection. These viruses infect hosts largely by inhalation of virus-laden

[4] HHS provides $590 million to accelerate pandemic influenza mRNA-based vaccine development, enhance platform capability for other emerging infectious disease. (January 17, 2025) https://www.hhs.gov/about/news/2025/01/17/hhs-provides-590-million-accelerate-pandemic-influenza-mrna-based-vaccine-development-enhance-platform-capability-other-emerging-infectious-disease.html

air. As such, their first opportunity to infect the body occurs in the larger passages of the upper respiratory tract—the nose, pharynx, larynx, trachea and bronchi.

12. Once these viruses invade cells of the upper airways, they hijack the body's intracellular machinery to replicate, and often cause cellular damage in the process by lysing the infected cells. If the body responds well, the immune system will prevent these viruses from spreading beyond the upper airways and will quickly terminate any illnesses induced by these viruses. If the immune response is insufficient, the infection might spread into the lower airways (alveoli) and develop into a much more serious systemic infection (including secondary infections such as bacterial pneumonia). The immune response to respiratory viruses in airway spaces is rather different when compared to an infection of the bloodstream from a skin wound or even an injection of a vaccine.

3.2. Influenza

13. Influenza has been recognized in humans as a seasonal illness for over a century with annual variations in prevalence and severity. Since wild birds can also migrate seasonally, the incidence of influenza is also seasonal in the wild. Adults can become infectious about a day before they manifest any symptoms, and they can remain infectious for five to seven days after the appearance of flu symptoms. These symptoms can include fever, cough, runny nose, body aches, nausea, vomiting, and diarrhea. The symptoms can be very mild to severe, with full recovery occurring in usually one to two weeks. After this time, recovered people and animals are rarely contagious. Adults tend to recover much faster than children.[5]

14. From the Orthomyxoviridae family, the influenza viruses occur in four types, A, B, C and D. The A and B types are mainly responsible for seasonal epidemics of the flu, whereas the C type produces mild illness, and the D type primarily infects cattle.[6] Their genomes consist of 8 segments of negative-sense stranded ribonucleic acid (RNA). Co-infection of the same cell with two different

[5] (2024) How flu spreads. Centers for Disease Control and Prevention. Retrieved from https://www.cdc.gov/flu/spread/index.html

[6] (2022) Types of influenza viruses. Centers for Disease Control and Prevention. Retrieved from https://www.cdc.gov/flu/about/viruses/types.htm

influenza viruses can allow the mixing of these segments to generate new variants, especially if one of the influenza strains is from another animal species.

15. The Influenza A viruses are divided into subtypes based on two proteins, *i.e.*, hemagglutinin (H) and neuraminidase (N), which are located on the surface of the virus. There are 18 different hemagglutinin subtypes (H1 though H18) and 11 different neuraminidase subtypes (N1 through N11). More than 130 influenza A subtype combinations have been identified in nature, mainly from wild birds, but there are likely additional influenza A subtype combinations given the propensity for virus "reassortment" of the eight RNA segments. The H1N1 and H3N2 subtypes have been responsible for the more recent influenza pandemics in humans. The H5N1 subtype in only rare occasions has caused serious illness in people, but it can efficiently infect and propagate in birds, and can infect other livestock such as cattle.

16. The most devastating human influenza pandemic on record is the 1918 "Spanish flu", which was caused by the H1N1 influenza virus A. It has been estimated to have produced disease in at least 500 million people, about a third of the world's population at the time, and resulted in up to 50 million deaths.[7] There were four waves of the Spanish flu, with the first occurring between February 15 and June 1, 1918, and the last wave persisting from December 1, 1919, to April 30, 1920.[8] Some 50,000 Canadians and 675,000 Americans appear to have succumbed to this H1N1 influenza A virus between 1919 and 1920. It had an estimated mortality rate of 2.5%, and primarily affected 25- to 40-year-olds. The deaths were primarily due to subsequent secondary bacterial pneumonia. The Spanish flu was probably one of the major factors that led to the end of World War I. The high lethality rate of the Spanish flu was likely a reflection in part of the high rates of war injuries, including damage to the airways and lungs by gas warfare, poor nutrition and inadequate sanitation, and high stress levels during the end and aftermath of World War I.

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[7] Liang, S.T., Liang, L.T., Rosen, J.M. (2021) COVID-19: A comparison to the 1918 influenza and how we can defeat it. Postgrad Med J. 97(1147):273–274. doi:10.1136/postgradmedj-2020-139070

[8] Yang, W., Petkova, E., Shaman, J. (2014) The 1918 influenza pandemic in New York City: Age-specific timing, mortality, and transmission dynamics. Influenza Other Respir Viruses. 8(2):177–188. doi:10.1111/irv.12217

On the termination of the war, the spread of the flu was exacerbated by the return of soldiers to their war-torn, home countries.

17. H1N1 influenza subtypes were prevalent in the 1950s and then largely disappeared until 1977 when they reappeared causing a pandemic that originated in the former USSR.[9] The 1977 H1N1 subtype had a fatality rate of less than 0.005% and was fairly mild; it primarily affected people 26 years of age or younger. The gene sequence of the 1977 H1N1 was almost identical to the N1H1 subtype from 1950,[10] leading scientists to believe it was likely to have "escaped" from a lab that was developing a vaccine against influenza.[11] People older than 26 in 1977 probably already had lasting immunity against the H1N1 strain due to prior exposure. However, influenza A viruses tend to mutate faster than influenza B type viruses, and so evasion of pre-existing immunity is more likely with influenza A viruses. The H1N1 subtype that emerged during the 2009–2010 flu season (called "swine flu" in the media) was caused by a combination of influenza A viruses that infected pigs, birds, and humans.

18. Vaccines against influenza are usually developed for North America based on a mix of the subtypes that appear to be prevalent during the prior flu season in the Southern Hemisphere. Often, these predictions fail, and new influenza vaccines prove to be less effective than desired for the new flu season. For example, in a meta-analysis study of vaccine effectiveness from the 2009–2010 influenza pandemic, it was estimated that in the Northern Hemisphere it was only 22% effective.[12] But when most circulating flu viruses are well-matched to those used to make

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[9] Kung, H.C., Jen, K.F., Yuan, W.C., Tien, S.F., Chu, C.M. (1978) Influenza in China in 1977: Recurrence of influenza virus A subtype H1N1. *Bull World Health Organ.* 56(6):913–918.

[10] Nakajima, K., Desselberger, U., Palese, P. (1978) Recent human influenza A (H1N1) viruses are closely related genetically to strains isolated in 1950. *Nature.* 274(5669):334–339. doi:10.1038/274334a0

[11] Rozo, M., Gronvall, G.K. (2015) The reemergent 1977 H1N1 strain and the gain-of-function debate. mBio. 6(4). doi:10.1128/mBio.01013-15

[12] Okoli, G.N., Racovitan, F., Abdulwahid, T., Righolt, C.H., Mahmud, S.M., *et al.* (2021) Variable seasonal influenza vaccine effectiveness across geographical regions, age groups and levels of vaccine antigenic similarity with circulating virus strains: A systematic review and meta-analysis of the evidence from test-negative design studies after the 2009/10 influenza pandemic. Vaccine. 39(8):1225–1240. doi:10.1016/j.vaccine.2021.01.032

flu vaccines, a reduction of flu illness between 40% to 60% can typically be observed.[13] It is clear that flu vaccines do not eliminate the potential threat of influenza infection in a population.

19. While the incidence of human influenza cases plummeted in 2020 and 2021 during the first two years of the COVID-19 pandemic, about 45% of the recorded influenza cases in Canada in the 2020–2021 season were in people who were recently vaccinated against the virus.[14] Since the influenza viruses in most vaccines tend to be attenuated, *i.e.,* weaker strains of influenza A viruses, there is a risk that some individuals who have weak immune systems that are unable to mount a sufficiently protective immune response, might contract the disease. Some inactive influenza vaccines use heat-killed virus, whereas others use only one of its proteins rather than the whole virus, but these tend to be less effective. With less efficacious vaccines, there remains a risk for a larger population of sick hosts and the increased opportunity for additional mutation of the virus to evade the weaker immune protection.

20. It should be appreciated that most people who die with influenza actually die from pneumonia. For that reason, Statistics Canada usually reports deaths from both influenza and pneumonia together. In the 2019–2020 flu season, there were 306 ICU admissions and 120 deaths with influenza in Canada, and over 70% were from influenza A. Over 90% of the human deaths were associated with at least one comorbidity, usually hypertension or another heart disorder. Typically, about 3,500 deaths with influenza occur annually in people in Canada.[15]

21. Even without prior immune protection from previous infection or vaccination, influenza can be successfully treated in most cases with antiviral drugs. Influenza A and influenza B viruses are sensitive to the recent antivirals oseltamivir (Tamiflu) from Roche and zanamivir (Relenza from GalaxoSmithKline). These are inhibitors of the neuraminidase enzyme on the surface of the

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[13] Centers for Disease Control and Prevention, N. C. f. I. a. R. D. N. (2023) Vaccine effectiveness: How well do flu vaccines work? Retrieved from https://www.cdc.gov/flu/vaccines-work/vaccineeffect.htm

[14] Nwosu, A., Lee, L., Schmidt, K., Buckrell, S., Sevenhuysen, C., Bancej, C. (2021) National Influenza Annual Report, Canada, 2020–2021, in the global context. Can Commun Dis Rep. 47(10):405–413. doi:10.14745/ccdr.v47i10a02

[15] (2023) Seasonal influenza, avian influenza and pandemic influenza. Infection Prevention and Control Canada. Retrieved from https://ipac-canada.org/influenza-resources

influenza particles, which is needed to permit budding and release of the virus from infected host cells.

3.3. The Innate and Adaptive Immune Systems

22. The composition and functioning of the immune system is complex, and involves hundreds of diverse immune-response proteins that affect over 20 different types of immune cells. What follows is a very brief introduction to this amazing multi-pronged defense system against infectious pathogens and cancer.

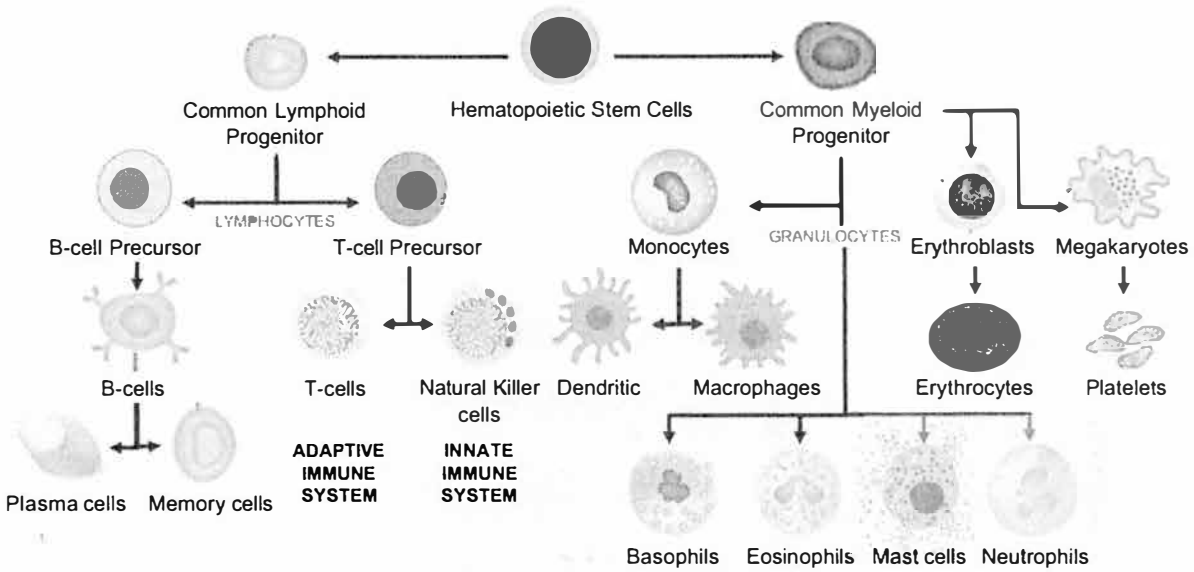
23. There are two main branches, known as the *innate* and the *adaptive* immune systems. The cells of the innate immune system are generally non-specific in their targeting, although they may be guided by antibodies that bind to pathogens. Immune cells develop very quickly, within minutes to days following exposure to a danger signal, and, therefore, are particularly useful for combating new pathogens. The innate immune system is especially strong in infants and children compared to adults. Over time, adaptive immune system cells called *lymphocytes* learn to recognize and remember foreign proteins and other structures called *antigens*. The specific portions that are targeted on an antigen are known as epitopes. The innate immune system, although still very active in adults, is less so due to the increased activity by the adaptive immune system to efficiently deal with an infection. Nonetheless, these two complementary systems work as a tightly coordinated defense force to protect the host against the diverse foreign agents that will be encountered over a lifetime.

24. Immune cells are collectively referred to as *white blood cells* or *leukocytes*. There is typically about one white blood cell for every *700 red bloods cells* or erythrocytes in the blood. There are many distinct leukocyte populations, particularly in the less specific innate immune system (Figure 1). For the purposes of this report, it is most useful to focus on the adaptive immune system. Precursor cells in the lymph nodes mature to form lymphocytes, of which *B-cells* (antibody-producing) and *T-cells* comprise the adaptive immune response. The B- and T-cells remaining after this careful selective process form a diverse pool of naïve lymphocytes that are sensitive to foreign pathogens. Selective stimulation of these naïve cells with antigens on

microbial pathogens triggers their activation and successive divisions and expansion into a clonal army of identical cells that have high specificity for an antigenic epitope (an epitope is the small part of target that is recognized by an antibody or T-cell antigen receptor). As the amount of foreign antigen in the environment declines, such as with the successful eradication of a pathogenic virus, the stimulated lymphocyte clones undergo programmed cell death or revert into an inactive resting state. During this process, memory lymphocytes also develop, which survive for various prolonged periods of times—in some cases even a lifetime—following exposure to a foreign entity. These memory cells can rapidly awaken from their slumber to engage with the pathogen once again when presented with the same or very similar antigens on the pathogen. This allows much faster and more effective immune responses than in their first encounter. This unique feature of long-term immunological memory is why recovery from a pathogenic infection often provides sustained protection against future encounters with that specific pathogen or a highly related pathogen. This is referred to as naturally acquired immunity. The durability of such natural immunity is exemplified with previous influenza infections. For example, plasma and memory B-cells in survivors of the 1918 influenza pandemic could endure for 85 years and could still produce antibodies upon reinfection with the same influenza pathogen.[16] When such immunity is established in a community, it is referred to as herd immunity. If the pathogen becomes endemic in the environment, then this becomes a source of antigen for natural boosting of the immune response as needed.

[16] Yu, X., Tsibane, T., McGraw, P., House, F.S., Keefer, C.J., *et al.* (2008) Neutralizing antibodies derived from the B-cells of 1918 influenza pandemic survivors. Nature. 455(7212):532–536. doi:10.1038/nature07231

Figure 1. Cells of the hematopoietic system.



3.4. Antibodies

25. The specific parts of the foreign antigens, such as tiny portions of viral proteins, that are recognized by B- and T-cells are called epitopes. As part of the *humoral* immune response, B-cells produce *immunoglobulin*s, which are relatively large proteins that bind to specific epitopes on antigens. These *antibodies* are among the most common classes of globulin proteins found in the plasma fraction of blood. Each B-cell initially produces a specific antibody that has affinity for a distinct epitope. Since the body has a broad repertoire of billions of different B-cells to recognize the various foreign antigens that it will encounter in a lifetime, at the start there can only be one of each unique antibody producing B-cell. However, in the process of clonal expansion, engagement of a B-cell with an antigen can induce its rapid proliferation into an army of identical B-cell clones that target exactly the same epitope on the antigen. Different B-cells may produce antibodies that bind to different epitopes on the same antigen; this is referred to as a *polyclonal antibody response*. In the long term, the body does not have the capacity to hold large numbers of each clone, so it expands and contracts the number of B-cell clones as required.

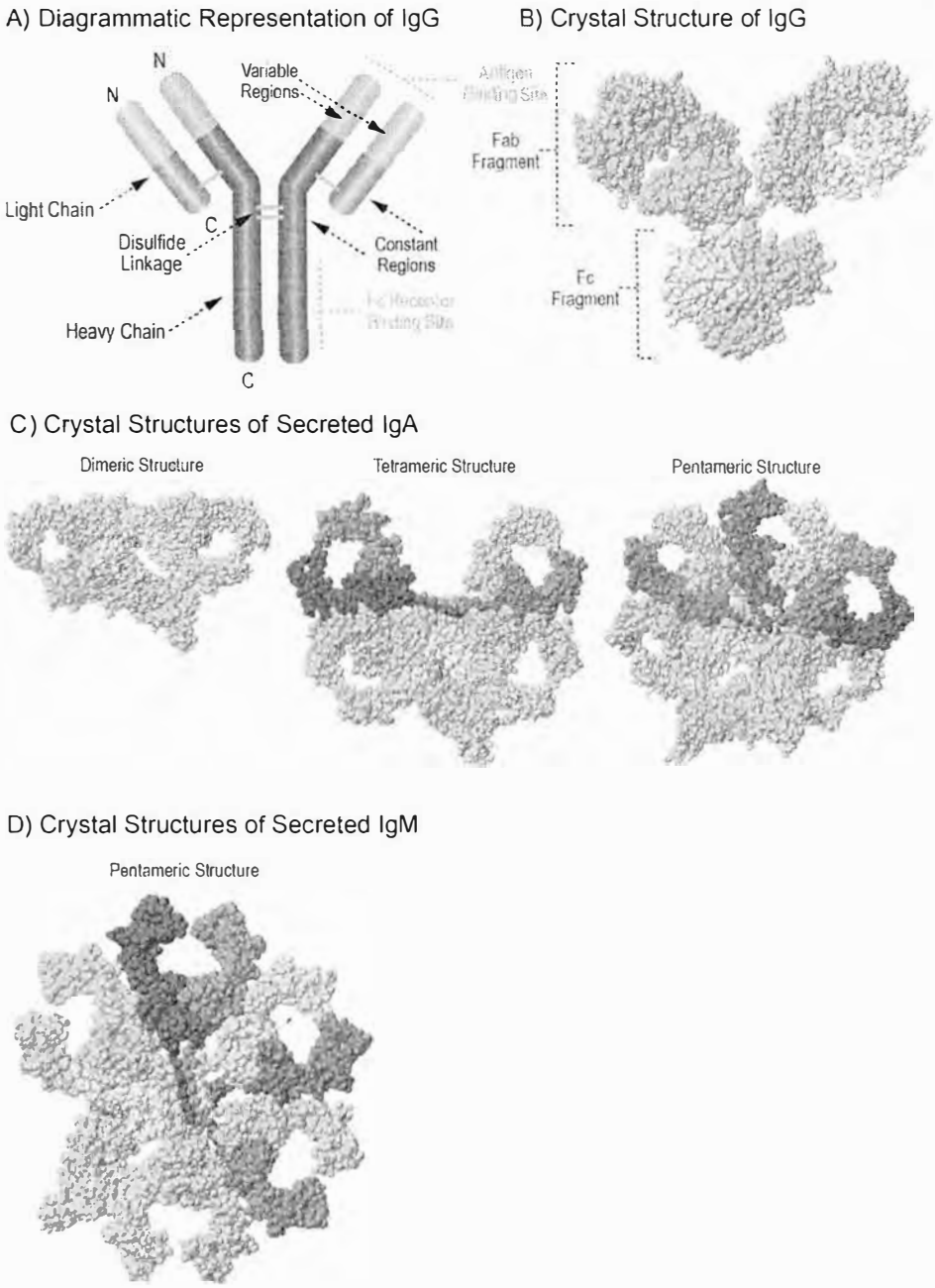
26. The pathogen itself might have many different proteins and other structures to which antibodies can bind. The binding of antibodies to a virus, bacteria or even the toxins produced by them, can block their functional interactions, such as attachment of the pathogen to host receptors to gain entry for replication. Bound antibodies also attract other immune mediators such as *complement proteins* to support the direct attack against antibody-coated infectious pathogens or cells infected with pathogens.

27. Antibodies are amazingly durable proteins. In humans, there are at least five different classes of antibodies that vary in their primary locations of action, ability to dock multiple antigens and stability (Figure 2). In the blood, IgG antibodies predominate, and these can survive for three weeks or more at 37°C, cruising at high speed through the 60,000 plus miles of the arteries, veins, and capillaries in the circulatory system as well as the lymphatic system. Stored at 4°C with antibiotics to prevent bacterial growth, these antibodies can retain their structure and binding properties for over a decade. In the nasopharynx, airway passages, lungs and lower digestive tract, secreted IgA and IgM antibodies can last for about five to six days. These latter antibodies are the most useful for fighting a respiratory virus infection. There are also IgD and IgE class antibodies that tend to exist primarily in the gut.

28. All human antibodies are composed of two identical large (heavy) chains and two identical small (light) chains linked together with disulfide atoms. These interwoven protein chains take on a "Y" shape where the branching portion (called the Fab portion) features two separate, identical binding regions at its tips for recognition of an epitope. This region is unique, with differences in amino acid sequences that define the specificity of an antibody. Due to the presence of two copies of epitope-binding domains in each antibody, antibodies are *bivalent* and can bridge two separate viruses simultaneously to cluster them into larger inactive complexes. The other end of the antibody, which is almost identical for antibodies of the same class, is known as the "Fc" portion and acts as a tail-piece. Many different cells of the innate immune system have specific Fc receptors, and so are directed to antibody-coated pathogens to facilitate their destruction. Antibodies of the IgD, IgE and IgG types are bivalent as they occur as only as monomers, or single units. However, IgA type antibodies can occur in units of two (dimers), four (tetramers), or five

(pentamers) as well, and IgM antibodies exist in complexes as pentamers or hexamers (6 copies) (Figure 2). This and other unique features of IgA and IgM class antibodies strengthen the mucosal antibody response to pathogenic microbes. These classes are better able than IgG class antibodies to sequester viruses and bacteria for destruction by roving macrophages. However, vaccines that are injected intramuscularly predominately generate IgG class antibodies.

Figure 2. Structures of Immunoglobulins. For visualization purposes, the light and heavy chains of the immunoglobulins are shown in different colors as space-filling representations of atoms on each of these macromolecules.



3.5. Detection of Viral Infections by PCR

29. Birds, amphibians and reptiles also produce a class of immunoglobulin known as IgY antibodies. These represent the major antibodies in these animals and are particularly concentrated in the yolks of bird eggs. The IgY structure is very similar to that of IgG antibodies with 2 light chains and 2 heavy chains, but they are less flexible than mammalian IgG.

30. The volume of an ostrich egg, about 1.3-1.4 liters, is typically about 25-time the volume of a chicken egg. Ostrich egg yolks contain about 4 grams of IgY, which is equivalent to the yield from the blood of about 8 rabbits.[17] Ostrich IgY are highly resistant to heat (up to 100°C) and pH changes (from 3.5 to 12).

31. There are two major types of testing used to determine whether a person or animal is actively infected with a pathogen like influenza. A nucleic acid test (NAT), most commonly the Reverse Transcription - Polymerase Chain Reaction (RT-PCR)-based test, has been used for detection of the RNA component of the virus. It relies on amplification of the viral nucleic acid material through repeated heating and cooling cycles of separation and annealing of the nucleic acid strands, with a doubling of the genetic material with each thermal cycle. The other type of test is the rapid antigen test (RAT), which typically detects the presence of a viral protein.

32. The main issue with the RT-PCR test is that it often employs a high number of thermal cycles (Ct), which can generate a large percentage of false-positive results. Individuals can still test positive with the RT-PCR test two weeks after they have fully recovered from COVID-19 and are non-contagious. It is not possible to amplify the viral protein material in a rapid antigen test, so it suffers from a lack of sensitivity and can often generate false-negatives. Depending on the specificity of the antibody detection reagent used, it may also cross-react with related proteins found in other influenza strains and produce false-positives for a target strain such as H5N1.

[17] https://ostritec.com/blog/ostrichs-strong-immune-system-leading-to-breakthrough-in-antibody-technology-research-/

33. While RT-PCR tests are based on a remarkable technology, they should not be used as a standalone "gold standard" test for defining cases of influenza or any other pathogen. It is wholly inappropriate to diagnose influenza, which is an illness with symptoms similar to those produced by infections with other respiratory viruses such as coronaviruses and RSV, based only on the presence of influenza RNA as detected by the PCR test. A positive result with a PCR test does not necessarily mean a person or animal has influenza and is able to transmit the disease. It is feasible that a person or animal may test positive for a virus from a swab from the mouth or nose simply by breathing in fragmented portions of the genome of the virus, which are replication incompetent. Cross-contamination of samples undergoing testing in a lab is also an issue with PCR-based testing.[18]

34. Firstly, every laboratory conducting RT-PCR tests for the detection of influenza should have determined an appropriate Ct cut-off through parallel testing of samples using the gold standard functional virology assay in which evidence of replication-competent, potentially infectious virus particles is obtained by looking for evidence of cytopathic effect (killing) in what are known as *permissive cells* (cells stripped of their antiviral properties so that viruses can readily infect them). For example, this was performed with the SARS-CoV-2 virus by Canada's National Microbiology Laboratory, with the Ct cut-off determined to be only 24, meaning that tests showing positive results at Ct values greater than 24 failed to demonstrate the presence of potentially infectious viral particles.

35. Ideally, following a positive-result with a PCR test, a collected sample from a swab should be tested for its ability to infect and kill permissive cells in culture. Alternatively, the sample can be

[18] Chandra, R. (2023) Preventing cross contamination in an infectious disease testing laboratory. Medical Laboratory Observer. https://www.mlo-online.com/management/lab-safety/article/53056019/preventing-cross-contamination-in-an-infectious-disease-testing-laboratory

injected into a fertilized, intact egg and tracked for the ability of the inoculate containing a pathogen to interfere with the development of the embryo in the egg.[19]

36. Secondly, the presence of replication-competent viral particles in a sample does not necessarily equate to a case of influenza, which is a disease with symptoms. The latter can only be diagnosed if an active infection is present in conjunction with signs and/or symptoms of illness, which would require assessment by a physician or veterinarian. However, it is typical for private and government laboratories to categorized swab samples with Ct cut-offs of up to 38 cycles and, in some cases, in the absence of clinical data, as representing positive cases of viral infection. However, this is associated with greater than 90% rate of false-positives with respect to replication-competent virus. Consequently, in the absence of data providing the Ct cut-off established using a functional virology assay, a PCR testing result alone is dubious.

37. Studies have shown that if more than 26 cycles of PCR amplification are required to detect the presence of SARS-CoV-2 RNA, the viral content is insufficient to propagate the virus in optimal cell culture conditions in a laboratory.[20] Unfortunately many results reported in the scientific literature are based on the use of 35 thermal cycles or greater. The extreme sensitivity of the PCR test to detect inactive virus is exemplified by its common use to detect the presence of the SARS-CoV-2 virus RNA (likely in a fragmented form) in waste water to monitor community levels of SARS-CoV-2 infection. The same issue would be true for influenza virus detection.

38. The Public Health Agency of Canada website "Avian influenza A(H5N1): For Health Professionals" states that:

> *"Influenza A and B RT-PCR with subtyping (H5) should be the primary method for detection of avian influenza A(H5N1). Any positive samples must be shared with the National Microbiology Laboratory (NML) for confirmatory testing and analysis to*

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[19] Testing protocol. Detection of pathogens by the inoculation Test in embryonated chicken eggs. US Department of Agriculture Center for Veterinary Biologicals. https://www.aphis.usda.gov/sites/default/files/VIRPRO1017.pdf

[20] Bullard, J., Dust, K., Funk, D., Strong, J.E., Alexaner, D., *et al.*, (2020) Predicting infectious SARS-CoV-2 from diagnostic samples. Clin. Infect. Dis. Ciaa638. doi:10.1093/cid/ciaa638

fulfill NML's obligations as a National Influenza Centre and Canada's obligations under the International Health Regulations and other agreements."[21]

39. Whether there is such a requirement for the Canadian Food Inspection Agency to also verify positive-PCR test results for influenza with the National Microbiology Laboratory in Winnipeg is unclear to me.

3.6. Rapid Antigen Tests for SARS-CoV-2

40. Unlike PCR tests that monitor for the presence of viral mRNA or DNA, antigen tests detect the presence of target proteins encoded by the genome of the pathogen. This relies on the availability of pre-made antibodies that bind specifically to one or more of the virus's proteins. Such antibodies may be generated in animals inoculated with target viral proteins artificially manufactured in cells, described as *recombinant* versions of the proteins. These recombinant proteins are believed to be essentially identical to the original viral proteins, although they may be subjected to minor genetic modifications. A major difference between the antigen tests and the genetic tests is that the number of viral protein molecules in a sample cannot be amplified as it is using the PCR method.

41. During the COVID-19 pandemic, many Canadian provincial health authorities recommended widespread use of rapid antigen tests, especially for those who did not receive at least two injections of a COVID-19 vaccine. However, the inability of the Abbott rapid antigen test to detect SARS-CoV-2 in asymptomatic people was confirmed in a study conducted by the Canadian Public Health Laboratory. The test kit was unable to detect SARS-CoV-2 in samples that tested positive with RT-PCR cycle thresholds greater than 22 (*i.e.*, Ct amplifications greater than 22 are required for a positive-result). People testing positive at cycle thresholds of 22 or less are very likely to be sick (*i.e.*, symptomatic).[22]

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[21] Avian influenza A(H5N1): For health professionals. Public Health Agency of Canada. (November 11, 2024) Retrieved from https://www.canada.ca/en/public-health/services/diseases/avian-influenza-h5n1/health-professionals.html

[22] (2021) Interim guidance for the detection of SARS-CoV-2 with the Abbott Panbio COVID-19 antigen rapid test. Public Health Agency of Canada. Retrieved from https://www.canada.ca/en/public-

42. Typically, swabs of mucus from inside the nose or back of the throat of a person or animal, the cloaca of birds, or a sample of blood are used in rapid antigen tests. There are several commercial rapid antigen test kits for detection of the H5N1 strain influenza viral proteins, including the CTK Biotech OnSite® Influenza A/B Ag Rapid Test,[23] the Ringbio Avian Influenza Antigen Test Kit, AIV Ag Test,[24] and GlobalDx Herdscreen® GDX84-2 AIV H5 Ag Test.[25]

3.7. Serological Tests for Antibodies Against Viruses

43. Once a virus is cleared by the immune system of recovered survivors of an infection, evidence of a previous infection and immunity is best established by the presence of antibodies in their blood and other body fluids such as saliva, or less commonly, by the presence of specific T lymphocytes in their blood.

44. Blood tests for antibody detection have the advantage that they are highly sensitive and can provide a measure of the immunity present in a previously infected individual, even years after the initial exposure to the virus. However, it is also possible to pick up cross-immunoreactivities with antibodies produced against related viral proteins found in other related viruses.

45. Serological antibody tests work by immobilizing a purified protein from a pathogen on a surface such a cellulose membrane, or glass or plastic slide. If an antibody present in a blood or saliva sample recognizes the protein or peptide as an antigen, then it may tightly bind to it. The binding of that antibody is then detected with a secondary antibody that recognizes the Fc portion of the primary antibody being tracked. For example, this could be an anti-human IgG antibody made in rabbits, sheep or even ostriches. The secondary antibody is tagged with a dye, or an enzyme that generates a dye, which will be visible on the surface of the antigen-coated membrane or slide.

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health/services/reports-publications/canada-communicable-disease-report-ccdr/monthly-issue/2021-47/issue-1-january-2021/interim-guidance-detection-sars-cov-2-abbott-panbio-antigen-rapid-test.html

[23] https://ctkbiotech.com/onsite-influenza-a-b-ag-rapid-test/

[24] https://www.ringbio.com/solutions/poultry/avian-influenza-antigen-test-kit

[25] https://globaldx.com/avian-flu/

For high throughput testing of many specimens at the same time, enzyme-linked immunosorbent assay (ELISA) plates are also commonly used.

46. According to the US CDC website on H5N1 serology testing, "*there are no commercially available H5N1 serological test since such testing does not currently have a clinical role in patient care.*"[26] Part of the challenge for development of a specific serological test for H5N1 proteins is the high degree of amino acid sequence identity between both the hemagglutinin (H) and neuraminidase (H) proteins of the different influenza strains. Figures 3 and 4 shows the amino acid identities and similarities between the N and H proteins of the most common influenza strains that target chickens. Inspection of these alignments of the amino acid sequences of the 5 most common H proteins and 7 most common N proteins in strains of influenza that account for most infections of chickens reveals a high degree of what is referred to as homology within the two groups of H and N proteins. This means that antibodies against one strain of the influenza virus are likely to give a positive-test result against several other strains of the virus if recombinant full length versions of these viral proteins are used as the antigens for detection of anti-H or anti-N antibodies present in serological samples. Furthermore, it is also likely that a previous exposure to one or more of these other influenza virus strains will confer some degree of protection and immunity against the H5N1 strain.

Figure 3. CLUSTAL O(1.2.4) multiple sequence alignments of 5 chicken influenza virus hemagglutinin (H) proteins using amino acid sequences from the Uniprot (www.uniprot.org) database. Each of the 20 possible amino acid types is represented with a single letter in the sequences of five representative H types. Amino acid identity (100% match) is represented with asterisks and amino acid similarity is represented by colons (highly similar) and periods (moderately similar). This alignment comparison was generated by Dr. Pelech using the automated software available at the Uniprot website.

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tr|Q4ZJF4|Q4ZJF4_9INFA   H9   MEAVSLITILL----VVTVSNADKICIGYQSTNSTETVDTLTENNVPVTHAKELLHTEHN   56
sp|P09345|HEMA_I59A0     H5   ME--RIVLLLA----IVSLVKSDQICIGYHANKSTKQVDTIMEKNVTVTHAQDILERTHN   54
sp|P19695|HEMA_I75A4     H4   MLSITILFLLIAEGSSQNYTGNPVICLGHHAVSNGTMVKTLTDDQVEVVTAQELVESQHL   60
sp|P12581|HEMA_I49A0     H10  MYKVVVIIALL-----GAVRGLDKICLGHHAVANGTIVKTLTNVQEEVTNATETVESTSL   55
sp|P09343|HEMA_I85A3     H7   MNTQILILTLV----AAIHTNADKICLGHHAVSNGTKVNTLTERGVEVVNATETVERRTI   56
                               *    ::  *            **:*:::  .   *.*: :    *. * : :.
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[26] CDC report on Missouri H5N1 serology testing. U.S. Centers for Disease Control and Prevention. (October 24, 2024) Retrieve from https://www.cdc.gov/bird-flu/spotlights/missouri-h5n1-serology-testing.html

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tr|Q4ZJF4|Q4ZJF4_9INFA  H9   GMLCATNLGHPLILDTCTIEGLIYGNPSCNLLLGGREWSYIVERPSAVNGLCYPGNVENL   116
sp|P09345|HEMA_I59A0    H5   GKLCSLNGVKPLILRDCSVAGWLLGNPMCDEFLNVPEWSYIVEKDNPINSLCYPGDFNDY   114
sp|P19695|HEMA_I75A4    H4   PELCPS-PLRLVDGQTCDIVNGALGSPGCNHLNG-AEWDVFIERPTAV-DTCYPFDVPDY   117
sp|P12581|HEMA_I49A0    H10  NRLCMK-GRSYKDLGNCHPIGMLIGTPACDLHLT-GTWDTLIERKNAI-AYCYPGTTINE   112
sp|P09343|HEMA_I85A3    H7   PRICTK-GKKAIDLGQCGLLGIITGPPQCDQFLE-FTADLIIERREGN-DVCYPGKFVNE   113
                                :*           *   .   * * *:       . ::*:      ***    :

tr|Q4ZJF4|Q4ZJF4_9INFA  H9   EELRSLFSSASSYQSIQIFPDTIWNVSY--SGTSKAC----SDSFYGSMRWLAQK--NNA   168
sp|P09345|HEMA_I59A0    H5   EELKHLLSSTNHFEKIQIIPRSSWSNHDASSGVSSACPYIGRSSFFRNVVWLIKK--DNA   172
sp|P19695|HEMA_I75A4    H4   QSLRSILANNGKFEFI--VEKFQWNT-VKQNGKSGACKRANENDFFTNLNWLTKS-DGNA   173
sp|P12581|HEMA_I49A0    H10  GALRQKIMESGGISKT--STGFAYGSSINSAGTTKACMRNGGDSFYAEVKWLVSKDKGQN   170
sp|P09343|HEMA_I85A3    H7   EALRQILRESGGINKE--TTGFTYSG-IRTNGVTSACRR-LGSSFYAEMKWLLSNTDNAA   169
                              *:  : . .  .         :.     * : **     ..*: .: ** ..  .

tr|Q4ZJF4|Q4ZJF4_9INFA  H9   YPIQDAQYTNNRGKNIPFMWGINHPPTDTVQTNLYTRTDTTTSVATEDINRTFKPLIGPR   228
sp|P09345|HEMA_I59A0    H5   YPTIKRSYNNTNQEDLLILWGIHHPNDAAEQTKLYQNPTTYVSVGTSTLNQRSIPEIATR   232
sp|P19695|HEMA_I75A4    H4   YPLQNLTKVNNGDYARLYIWGVHHPSTDTEQTNLYENNPGRVTVSTKTSQTSVVPNIGSR   233
sp|P12581|HEMA_I49A0    H10  FPQTTNTYRNTDTAEHLIIWGIHHPSSTQEKNDLYGTQSLSISVGSSTYQNNFVPVVRAR   230
sp|P09343|HEMA_I85A3    H7   FPQMTKSYKNTRNEPALIVWGIHHSGSATEQTKLYGSGNKLITVGSSNYQQSFVPSPGAR   229
                              :*       *.       :**::*      :..**       :*.:.  :    *    *

tr|Q4ZJF4|Q4ZJF4_9INFA  H9   PLVNGQQGRIDYYWSVLKPGQTLRVRSNGNLTAPWYGHILSGESHGRILKTDLNSGNCVV   288
sp|P09345|HEMA_I59A0    H5   PKVNGQSGRMEFFWTILKPNDAINFESNGNFIAPEYAYKIVKKGDSAIMKSGLAYGNCDT   292
sp|P19695|HEMA_I75A4    H4   PWVRGQSGRISFYWTIVEPGDIIVFNTIGNLIAPRGHYKLNSQKKSTILNTAVPIGSCVS   293
sp|P12581|HEMA_I49A0    H10  PQVNGQSGRIDFHWTLVQPGDNITFSHNGGRIAPSRVSKLVGRGL-GIQSEASIDNGCES   289
sp|P09343|HEMA_I85A3    H7   PQVNGQSGRIDFHWLILNPNDTVTFSFNGAFVAPDRVSFFKGKSM-GIQSEVPVDTNCEG   288
                              * *.**.**:.:.* :::*.: : .   *   **     :  .    * .      .*

tr|Q4ZJF4|Q4ZJF4_9INFA  H9   QCQTERGGLNTTLPFHNVSKYAFGNCPKYVGVKSLKLAVGLRNVPAR----SSRGLFGAI   344
sp|P09345|HEMA_I59A0    H5   KCQTPVGAINSSMPFHNIHPHTIGECPKYVKSDRLVLATGLRNVPQR----KKRGLFGAI   348
sp|P19695|HEMA_I75A4    H4   KCHTDRGSITTTKPFQNISRISIGDCPKYVKQGSLKLATGMRNIPEK----ATRGLFGAI   349
sp|P12581|HEMA_I49A0    H10  KCFWRGGSINTKLPFQNLSPRTVGQCPKYVNKKSLMLATGMRNVPEIM---QGRGLFGAI   346
sp|P09343|HEMA_I85A3    H7   ECYHNGGTITSNLPFQNVNSRAVGKCPRYVKQKSLLLATGMKNVPEIPKKREKRGLFGAI   348
                              :*    * :.:. **:*:   :.*.**:**    * **.*::*:*        *******

tr|Q4ZJF4|Q4ZJF4_9INFA  H9   AGFIEGGWSGLVAGWYGFQHSNDQGVGMAADRDSTQKAIDKITSKVNNIVDKMNKQYEII   404
sp|P09345|HEMA_I59A0    H5   AGFIEGGWQGMVDGWYGYHHSNEQGSGYAADKESTQKAIDGITNKVNSIIDKMNTQFKAV   408
sp|P19695|HEMA_I75A4    H4   AGFIENGWQGLIDGWYGFRHQNAEGTGTAADLKSTQAAIDQINGKLNRLIEKTNEKYHQI   409
sp|P12581|HEMA_I49A0    H10  AGFIENGWEGMVDGWYGFRHQNAQGTGQAADYKSTQAAIDQITGKLNRLIEKTNTEFESI   406
sp|P09343|HEMA_I85A3    H7   AGFIENGWEGLVDGWYGFRHQNAQGEGTAADYKSTQSAIDQITGKLNRLIEKTNQQFELI   408
                              *****.**.*:: ****::*.* :* * *** .*** *** *..*:* :::* * ::. :

tr|Q4ZJF4|Q4ZJF4_9INFA  H9   DHEFSEVETRLNMINDKIDDQIQDIWAYNAELLVLLENQKPLDEHDANVNNLYNKVKRTL   464
sp|P09345|HEMA_I59A0    H5   GKEFNNLERRVENLNKKMEDGFLDVWTYNVELLVLMENERTLDFHDSNVKNLYDKVRLQL   468
sp|P19695|HEMA_I75A4    H4   EKEFEQVEGRIQDLEKYVEDTKIDLWSYNAELLVALENQHTIDVTDSEMDKLFERVRRQL   469
sp|P12581|HEMA_I49A0    H10  ESEFSEIEHQIGNVINWTKDSITDIWTYQAELLVAMENQHTIDMADSEMLNLYERVRKQL   466
sp|P09343|HEMA_I85A3    H7   DNEFTEVEKQIGNVINWTRDSITEVWSYNADLLVAMENQHTIDLADSEMNKLYERVRRQL   468
                                ** ::* ::  : .   *   ::*:*:.:*** :**:: :*  *::: :*:::*:  *

tr|Q4ZJF4|Q4ZJF4_9INFA  H9   GSNAVEDGKGCFELYHKCDDQCMETIRNGTYNRRKYKEESRLERQKIEGVKLESEGTYKI   524
sp|P09345|HEMA_I59A0    H5   KDNARELGNGCFEFYHKCDNECMESVRNGTYDYPQYSEEARLNREEISGVKLESMGVYQI   528
sp|P19695|HEMA_I75A4    H4   RENAEDKGNGCFEIFHQCDNNCIESIRNGTYDHDIYRDEAINNRFQIQGVKLTQ-GYKDI   528
sp|P12581|HEMA_I49A0    H10  RQNAEEDGKGCFEIYHTCDDSCMESIRNNTYDHSQYREEALLNRLNINSVKLSS-GYKDI   525
sp|P09343|HEMA_I85A3    H7   RENAEEDCTGCFEIFHKCDDDCMASIRNNTYDHSTYREEAMQNRVKIDPVKLSS-GYKDV   527
                               .** :  .****::* **:.*: ::**.**:   * :*:  :* :*. *** . *  .:

tr|Q4ZJF4|Q4ZJF4_9INFA  H9   LTIYSTVASSLVIAMGFAAFLFWAMSNGSCRCNICI   560
sp|P09345|HEMA_I59A0    H5   LSIYSTVASSLALAIMIAGLSFWMCSNGSLQCRICI   564
sp|P19695|HEMA_I75A4    H4   ILWISFSISCFLLVALLLAFILWACQNGNIRCQICI   564
sp|P12581|HEMA_I49A0    H10  ILWFSFGASCFVLLAAVMGLVFFCLKNGNMQCTICI   561
sp|P09343|HEMA_I85A3    H7   ILWFSLGASCFLLLAIAMGLVFMCVKNGNMRCTICI   563
                              :   *   *.: :     .: :   .**. :* ***
```

Figure 4. CLUSTAL O(1.2.4) multiple sequence alignments of 7 chicken influenza virus neuramidase (N) proteins using amino acid sequences from the Uniprot (www.uniprot.org) database. Each of the 20 possible amino acid types is represented with a single letter in the sequences of five representative H types. Amino acid identity (100% match) is represented with asterisks and amino acid similarity is represented by colons (highly similar) and periods (moderately similar). This alignment comparison was generated by Dr. Pelech using the automated software available at the Uniprot website.

```
tr|D1LM97|D1LM97_9INFA          N8  MNPNLKIITIGSVSLGLVVLNILLHIVSIT---ITVLVLPGD-GNN---------GSCNE 47
sp|Q809V2|NRAM_I01A2            N1  MNPNQKIITIGSICMVIGIVSLMLQIGNIISIWVSHSIQTGNQHQA---------EPCNQ 51
sp|P18881|NRAM_I000F            N7  MNPNQKLFALSGVAIALSVLNLLIGISNVGLNVSLHLKGEGVKQENNLTCTTITQ--NNT 58
tr|A0A0C4K198|A0A0C4K198_9INFA  N9  MNPNQKILCTSATAIIIGAIAVLIGIANLGLNIGLHLKPGCNCSHSQPET---TN--TSQ 55
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA  N6  MNPNQKITCISATGMTLSVVSLLIGIANLGLNIGLHYKVSDSTTINIPNM---NE--T-- 53
tr|A6M7W4|A6M7W4_9INFA          N3  MNPNQKIITLGVVNTTLSTIALIIGVGNLIFNTVIHEKIGDHQTVVYPTVTPPGTPNCSD 60
sp|P09573|NRAM_I83A6            N2  MNPNQKIITIGSVSLTIATVCFLMQIAILATNVTLHFRQNERSIPAYNQTTP-----CKP 55
                                    **** *:   .     :  : .:: :  :

tr|D1LM97|D1LM97_9INFA          N8  TVIREYNETVRIEKITQWHNTNIIE-YIEKPESDLFMNNTEPLCDAKGFAPFSKDNGIRI 106
sp|Q809V2|NRAM_I01A2            N1  SIITYENNTWVNQTYVNISNTNL---LTEKAVASVTLAGNSSLCPISGWAVYSKDNGIRI 108
sp|P18881|NRAM_I000F            N7  TVVENTY----------VNNTTIINKG-TNLKAPNYLLLNKSLCSVEGWVVIAKDNAIRF 107
tr|A0A0C4K198|A0A0C4K198_9INFA  N9  TII-NNY----------YNETNITNIQMEERTSRNFNNLTKGLCTINSWHIYGKDNAVRI 104
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA  N6  ------N----------PTTTNITNIIVNKNEERTFLNLTKPLCEVNSWHILSKDNAIRI 97
tr|A6M7W4|A6M7W4_9INFA          N3  TIITYNN----------TVVNNITTTII--AEAEKHFKPSLPLCPFRGFFPFHKDNAIRL 108
sp|P09573|NRAM_I83A6            N2  I------------------------II--ERNIKYRNWSKPQCQITGFAPFSKDNSIRL 88
                                                                .  *   .:    ***.:*:

tr|D1LM97|D1LM97_9INFA          N8  GSRGHVFVIREPFVSCSPTECRTFFLTQGSLLNDKHSNGTVKDRSPYRTLMSVGIGQSPN 166
sp|Q809V2|NRAM_I01A2            N1  GSKGDVFVIREPFISCSHLECRTFFLTQGALLNDKHSNGTVKDRSPYRTLMSCPVGEAPS 168
sp|P18881|NRAM_I000F            N7  GESEQIIVTREPYVSCDPSGCKMYALHQGTTIRNKHSNGTIHDRTTFRGLISTPLGTPPT 167
tr|A0A0C4K198|A0A0C4K198_9INFA  N9  GESSDVLVTREPYVSCDPDECRFYALSQGTTIRGKHSNGTIHDRSQYRALISWPLSSPPT 164
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA  N6  GEDAHILVTREPYLSCDPQGCRMFALSQGTTLRGRHANGTIHDRSPFRALISWEMGQAPS 157
tr|A6M7W4|A6M7W4_9INFA          N3  GENKDVIVTREPYVSCDNDGCWSFALAQGALLGTKHSNGTIKDRTPYRSLIRFPIGTAPV 168
sp|P09573|NRAM_I83A6            N2  SAGGGIWVTREPYVSCDPSKCYQFALGQGTTLDNNHSNGTIHDRTPHRTLLMNELGVPFH 148
                                    .   : * ***::**.   *  : * **: :  .*:***::**: .* *:   :.

tr|D1LM97|D1LM97_9INFA          N8  VYQARFEAVAWSATACHDGKKWMTIGVTGPDAKAVAVVHYGGIPTDVINSWAGDILRTQE 226
sp|Q809V2|NRAM_I01A2            N1  PYNSRFESVAWSASACHDGTSWLTIGISGPDNGAVAVLKYNGIITDTIKSWRNNILRTQE 228
sp|P18881|NRAM_I000F            N7  VSNSDFICVGWSSTSCHDGVGRMTICIQGNNDNATATVYYNRRLTTTIKTWAKNILRTQE 227
tr|A0A0C4K198|A0A0C4K198_9INFA  N9  VYNSRVECIGWSSTSCHDGKSRMSICISGPNNNASAVVWYNRRPVAEINTWAQNILRTQE 224
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA  N6  PYNTRVECIGWSSTSCHDGISRMSICISGPNNNASAVVWYRGRPVTEIPSWVGNILRTQE 217
tr|A6M7W4|A6M7W4_9INFA          N3  LGNYKEICVAWSSSSCFDGKEWMHVCMTGNDNDASAQIIYAGKMTDSIKSWRRDILRTQE 228
sp|P09573|NRAM_I83A6            N2  LG-TRQVCIAWSSSSCHDGKAWLHVCVTGDDRNATASFIYNGMLVDSIGSWSQNILRTQE 207
                                        .:.**:::*.**   : : : * :  * * . *    .  * :*  :******

tr|D1LM97|D1LM97_9INFA          N8  SSCTCIQGECYWVMTDGPANRQAQYRAFKAKQGKIIGQTEIS-FNGGHIEECSCYPNEGK 285
sp|Q809V2|NRAM_I01A2            N1  SECACVNGSCFTVMTDGPSNGQASYKIFKIEKGKVVKSVELN-APNYHYEECSCYPDAGE 287
sp|P18881|NRAM_I000F            N7  SECVCYNGTCAVVMTDGPASSQAYTKIMYFHKGLIIKEEPLR-GSARHIEECSCYGHDQK 286
tr|A0A0C4K198|A0A0C4K198_9INFA  N9  SECVCHNGVCPVVFTDGSATGPADTRIYYFKEGKILKWESLT-GTAKHIEECSCYGERTG 283
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA  N6  SECVCHKGICPVVMTDGPANNKAATKIIYFKEGKIQKIEELQ-GNAQHIEECSCYGAAGM 276
tr|A6M7W4|A6M7W4_9INFA          N3  SECQCIDGTCVVAVTDGPAANSADHRVYWIREGRVIKYENVPKTKIQHLEECSCYVDI-D 287
sp|P09573|NRAM_I83A6            N2  SECVCINGTCTVVMTDGSASGKADIRILFIREGKIVHISPLS-GSAQHIEECSCYPRYPN 266
                                    *.* * .* *  ..*** :   *  :    .:* :     :      * ******

tr|D1LM97|D1LM97_9INFA          N8  VECVCRDNWTGTNRPVLVISSD-LSYRVGYLCAGLPSDTPRGEDNQFTGSCTSPMGN--Q 342
sp|Q809V2|NRAM_I01A2            N1  ITCVCRDNWHGSNRPWVSFNQN-LEYQIGYICSGVFGDNPRPNDG--TGSCGPVSPN--G 342
sp|P18881|NRAM_I000F            N7  VSCVCRDNWQGANRPIIEIDMSTLEHTSRCVCTGVLTDTSRPGDKP-NGDCSNPITGSPG 345
tr|A0A0C4K198|A0A0C4K198_9INFA  N9  ITCTCRDNWQGSNRPVIQIDPVAMTHTSQYICSPVLTDNPRPNDPN-IGKCNDPYPGN-N 341
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA  N6  IKCVCRDNWKGANRPIITIDPEMMTHTSKYLCSKILTDTSRPNDPT-NGNCDAPITGGSP 335
tr|A6M7W4|A6M7W4_9INFA          N3  VYCVCRDNWKGSNRPWMRINNE-TILETGYVCSKFHSDTPRPADPS-TVSCDSPSNVN-G 344
sp|P09573|NRAM_I83A6            N2  VRCVCRDNWKGSNRPVIDINMADYSIDSSYVCSGLVGDTPRNDDSSSSSNCRDPNNER-G 325
                                    : *.***** *:*** : :.          :*: .  *. *  *     .*
```

```
tr|D1LM97|D1LM97_9INFA          N8  GYGVKGFGFRQGNDVWMGRTISRTSRSGFEILRVRDGWIQ-NSKEQIKRQVVVDNLNWSG 401
sp|Q809V2|NRAM_I01A2            N1  AYGIKGFSFKYGNGVWIGRTKSTNSRSGFEMIWDPNGWTG-TDSNFSVKQDIVAITDWSG 401
sp|P18881|NRAM_I000F            N7  APGVKGFGFLNGDNTWLGRTISPRSRSGFEMLKIPNAETD-PNSRIIERQEIVDNSNWSG 404
tr|A0A0C4K198|A0A0C4K198_9INFA  N9  NNGVKGFSYLDGANTWLGRTISTASRSGYEMLKVPNALTD-DRSKPIQGQTIVLNADWSG 400
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA  N6  DPGVKGFAFLDGENSWLGRTISKDSRSGYEMLKVPNAETD-TQSGPTSYQLIVNNQNWSG 394
tr|A6M7W4|A6M7W4_9INFA          N3  GPGVKGFGFKTGDDVWLGRTVSISGRSGFEIIRVAEGWINSPNHAKSVTQTLVSNNDWSG 404
sp|P09573|NRAM_I83A6                NPGVKGWAFDIGDDVWMGRTISKDSRSGYETFRVIGGWATANSKSQTNRQVIVDNNNWSG 385
                                      *:**:.:  * . *:*** *  .***:* :    .           * :*   :***

tr|D1LM97|D1LM97_9INFA          N8  YSGSFTLPVELTRRNCLVPCFWVEMIRGKPEEK--TMWTSSSSIVMCGVDHEIADWSWHD 459
sp|Q809V2|NRAM_I01A2            N1  YSGSFVQHPELTGVDCIRPCFWVELIRGRPKES--TIWTSGSSISFCGVNSDTVGWSWPD 459
sp|P18881|NRAM_I000F            N7  YSGSFIDCWD-EANECYNPCFYVELIRGRPEEAKYVWWTSNSLIALCGSPVSVGSGSFPD 463
tr|A0A0C4K198|A0A0C4K198_9INFA  N9  YSGSFMDYWA-E-GDCYRACFYVELIRGRPKEDK-VWWTSNSIVSMCSSTEFLGQWNWPD 457
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA  N6  YSGAFIDYWA-N-KECFNPCFYVELIRGRPKEID-VLWASNSMVALCGSRERLGSWSWHD 451
tr|A6M7W4|A6M7W4_9INFA          N3  YSGSFIV----ENNGCFQPCFYVELIRGRPNKNDDVSWTSNSIVTFCGLDNEPGSGNWPD 460
sp|P09573|NRAM_I83A6            N2  YSGIFSV----ESKSCINRCFYVELIRGRPQE-TRVWWTSNSIVVFCGTSGTYGTGSWPD 440
                                    *** *          *   **:**:***:*::   . *:*.* : :*.       .: *

tr|D1LM97|D1LM97_9INFA          N8  GAILPFDIDKM  470
sp|Q809V2|NRAM_I01A2            N1  GAELPFTIDK-  469
sp|P18881|NRAM_I000F            N7  GAQIQYFS---  471
tr|A0A0C4K198|A0A0C4K198_9INFA  N9  GAKIEYFL---  465
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA  N6  GAEIIYFK---  459
tr|A6M7W4|A6M7W4_9INFA          N3  GSNIGFMPK--  469
sp|P09573|NRAM_I83A6            N2  GANINFMPL--  449
                                    *: : :
```

47. A microneutralization assay is another test for the presence of antibodies in a specimen sample that is capable of blocking the ability of the avian influenza H5N1 virus to bind to host cells and cause their death. However, this is a more cumbersome and expensive test that takes longer and requires the use of cells in culture, and focuses only on a subset of antibodies in a sample that can confer immune protection.[27]

48. While commercial serological tests for anti-H5 or anti-N1-specific antibodies do not apparently exist, it is very feasible to quickly develop such tests. There are several regions in the amino acid sequences of the hemagglutinin and neuraminidase proteins that are highly unique and distinguishable from the other influenza strains as can be seen in Figures 3 and 4. Short peptides based upon these amino acid sequences can easily be produced commercially and tested for their immunogenicity to antibodies recovered in blood samples from humans or egg yolk samples from birds. This kind of testing for antibodies in human blood samples against the SARS-CoV-2 proteins

[27] Protocol for enhanced human surveillance of avian influenza A(H5N1) on farms in Canada. Public Health Agency of Canada. (November 20, 2024) Retrieved from https://www.canada.ca/en/public-health/services/diseases/avian-influenza-h5n1/health-professionals/protocol-enhanced-human-surveillance-avian-influenza-farms-canada.html

that was previously undertaken in my own laboratory.[28] This involved the use of peptide SPOT arrays in which all of the 28 predicted proteins encoded by the SARS-CoV-2 genome were synthesized directly on cellulose membranes in short peptides of 14 amino acid length. This allowed the testing of over 6,000 peptides as potential markers of a SARS-CoV-2 immune response.

49. These COVID-19-related studies in my lab demonstrated that certain regions of the SARS-CoV-2 protein elicited particularly robust antibody responses in people that recovered from COVID-19. Approximately 4,500 participants were tested for SARS-CoV-2 antibodies in their serum in this clinical study that I led at Kinexus Bioinformatics. Interestingly, many people, who never developed symptoms of COVID-19, were found to have strongly immunoreactive antibodies, which probably accounted for why they did not show any symptoms of infection during the multiple waves of COVID-19 cases during the pandemic. These studies also revealed that different people had very distinctive patterns of antibody reactivity against the various SARS-CoV-2 epitopes, and these patterns were very stable for more than a year for the same person. This may reflect, in part, genetic differences between the clinical study participants. It is also likely that the antibodies that immunoreacted against the SARS-CoV-2 peptides were generated in asymptomatic individuals from exposure to other coronaviruses previously in their history, and this conferred a degree of immunity from getting sick when exposed to SARS-CoV-2.

50. As someone who recognizes the importance of development of sensitive and specific tests to evaluate immunity against H5N1 influenza, whether by natural infection or by immunization with vaccines, it seems to me that the herd of ostriches at Universal Ostrich Farms site represent a very unique opportunity to develop such antibody tests. SPOT arrays with a set of optimal H5N1 peptides would be useful not only for evaluation of the potential immunity of wild and domesticated birds to H5N1 infection, but also easily adapted for testing humans and other livestock such as minks, pigs and cows.

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[28] Majdoubi, A., Michalski, C., O'Connell, S.E., Dada, S., Narpala, S. *et al.* (2021) A majority of uninfected adults show pre-existing antibody reactivity against SARS-CoV-2. *JCI Insight* 6(8): e14631. https://doi.org/10.1172/jci.insight.146316

PART 4 – THE RISKS OF INFLUENZA TRANSMISSION FROM THE UOF HERD AND THEIR VALUE

51. In this section of my expert report, I will comment on the specific questions that I was asked to address by Cleveland Doan LLP.

52. **What is the likelihood that the Herd presently is transmissible for H5N1 to each other and wild migratory birds such as ducks?**

53. At this time, it is highly unlikely that H5N1 is being actively transmitted within the Herd or that it would be transmissible to humans, wild birds or other animals. It would appear that the Herd has achieved a high degree of natural immunity. My conclusions are based on the following observations that are described as facts in paragraph 4, and additional information that I have learned from listening to the owners of the UOF ostriches.

54. The Herd underwent a period of illness around February 2020, which resulted in the deaths of 10 of the approximately 250 ostriches that were on-site. While this was diagnosed as a possible bacterial pseudomonas or *E. coli* infection at the time, the symptoms associated with the illness were also consistent with influenza. The first report of a pathogenic H5N1 virus in Canada was in December 2021 in Newfoundland and Labrador.[29] However, this particular virulent strain of H5N1 was already detected in wild birds in Europe in 2020, and the first H5N1 strain was first detected in geese in China in 1996.[30] Therefore, it is feasible that the ostrich herd could have been infected with H5N1 or a highly related influenza strain in 2020. In addition, secondary bacterial infections following initial influenza infection often are accompanied by a pseudomonas infection.[31]

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[29] Distribution of highly pathogenic avian influenza in North America, 2021/2022. National Wildlife Health Center. (November 27, 2022) Retrieved from https://www.usgs.gov/centers/nwhc/science/distribution-highly-pathogenic-avian-influenza-north-america-20212022

[30] Katella, K. (2024) H5N1 Bird Flu: What you need to know. Yale Medicine. Retrieved from https://www.yalemedicine.org/news/h5n1-bird-flu-what-to-know

[31] Morris, D.E., Cleary, D.W., Clarke, S.C. (2017) Secondary bacterial infections associated with influenza pandemics. Front Microbiol. 8:1041. doi: 10.3389/fmicb.2017.01041.

55. It is significant that with the recent outbreak of what appears to be H5N1 in the UOF Herd, all of the deaths were in younger ostriches that were not on the farm prior to 2021. None of the older ostriches that survived the 2020 outbreak died or were seriously ill. This is extremely strong evidence that these older birds already had natural immunity to H5N1, most likely from a previous exposure. That 69 of some 200 younger birds succumbed to the recent infection indicates that this was a particularly virulent strain, and yet it had minimal effect on the older ostriches.

56. It is somewhat problematic that only a PCR-test for H5N1 was performed on two of the ostriches that died in January of this year. As pointed out in the previous section, performed at a high thermal cycle (Ct) number, this test has a high rate of false-positives. It is unclear at what Ct number the test was performed by the CFIA. For positive-test results with human cases of H5N1, this is normally rechecked by the National Microbiology Laboratory in Winnipeg. It is not known to the owners of UOF whether this was done or even if the PCR test was repeated.

57. It is also unclear whether the presence of viable H5N1 was in the mouth and rectal samples from the two dead birds retrieved by the CFIA inspectors. Normally, the samples would be checked for their ability to infect and kill cells in culture or injected into fertilized eggs and cause developmental defects or loss of viability of the embryo. However, on the basis of probabilities, it seems likely that these birds did die with an influenza H5N1 infection.

58. The main issue is whether the remaining ostriches represent a health hazard to each other, the staff and visitors to the UOF, and wild birds and animals that come to the farm. In view of the information that there was been no deaths from infectious disease on the farm for over two weeks, and all of the ostriches appear to be healthy, it is highly likely that herd immunity has been achieved in the flock. It is extremely unlikely that they would be shedding virus to each other, their caretakers, and to other birds and animals. The longer that these birds remain healthy, the lower the risk of potential transmission of the virus.

59. To confirm that these ostriches have natural immunity, I recommend that the antibody levels against the H5 and N1 proteins be tested in a subset of the younger ostriches as well as some of

the older birds, which are likely to serve as positive controls. The owners and staff that attend these birds should also be tested to determine if they also have natural immunity.

60. It is likely that the ostriches at the UOF were originally infected by sick ducks that visited the farm during their migration and intermingled with ostriches as they attempted to eat their feed. It is likely that these flocks of wild birds have been developing their own natural immunity to the H5N1 virus. If the UOF ostriches have achieved natural immunity to H5N1, then this flock may actually offer some protection to wild birds from future infection with the virus. Wild birds that come to the UOF would be less likely to visit other neighbouring sites and infect birds and other animals at those locations, which would be naïve to the virus and more vulnerable to getting sick and further propagating the spread of the virus.

61. By breeding ostriches that are able to easily recover from a viral infection like H5N1, it is also feasible to produce offspring that are even more resistant to future viral epidemics. However, if a herd is completely destroyed after the first signs of H5N1 infection, it would likely be replaced by young birds that have had no previous exposure to the virus and not necessarily to right genetics to limit future infections and prevent sickness and death.

62. **If the Herd has achieved herd immunity, is there anything rare and valuable about the Herd that would promote the advancement of biomedical research?**

63. As pointed out in paragraph 30, the ostrich is an amazing model system for the production of antibodies for research and even therapeutic purposes. The IgY antibodies that are enriched in the yolk of the largest eggs that are produced by birds. These antibodies are also the most heat and pH resistant antibodies known,[17] which makes these immunoglobulins extremely attractive for industrial applications. One example of this is the use of the anti-SARS-CoV-2 antibodies to coat masks to offer increased protection from infection and reduced transmission of this virus

during a COVID-19 outbreak, which is an application developed by Dr. Yasuhiro Tsukamoto at Kyoto University in Japan.[32] Dr. Tsukamoto is an active collaborator with the UOF.

64. The high yield of IgY antibody in the yolk of ostrich eggs is extremely convenient for large scale antibody production, as it is unnecessary to have to subject the animals to any stress. In my own lab, we have been producing antibodies that target proteins that are important disease research for over 36 years, using rabbits. For the production of rabbit antibodies, we have to obtain the blood from the animal, which involves bleeding from its ear or termination of the animal and exsanguination. From one rabbit, the median yield of an affinity-purified antibody is in own hands is about 1.5 mg. In the biomedical research reagent market, this amount of antibody against an interesting target protein is worth about $6,000 if it is all sold. For comparison, from one ostrich egg, around 12 mg or more of affinity-purified antibody can be obtained, which would be worth about $48,000. if it was all sold. Literally, ostrich hens can lay golden eggs if the right proteins are targeted for development of highly desirable antibodies. Moreover, due to their long reproductive life spans, ostriches can keep producing more eggs over a period of decades.

65. Another advantage of using ostriches as opposed to using mammals like rabbits, goats, sheep, horses and mice for antibody production is that there is greater success in being able to produce a desired antibody, since the physiology of birds is more distinct and it is less likely that the antigen may resemble a naturally occurring human protein. Due to phenomena of tolerance, B-cells that recognize proteins in the body are often killed off early in development of the immune system to avoid the development of auto-immune disease.

66. In addition to antibody development, ostrich eggs are rich in oils, fats and other enzymes, including proteases and carbohydrolases such as lysozyme, which also have industrial applications.

[32] Finney, A. (2022) Kyoto University creates mask from ostrich cells that glows when coronavirus is detected. Dezeen. Retrieved from https://www.dezeen.com/2022/01/11/ostrich-coronavirus-detection-mask-glow-kyoto-university-yasuhiro-tsukamoto/

67. Due to the continued use of the UOF ostriches in biomedical research, their genetic profiling, their history of H5N1 infection, their long lifespan, and the banking of their eggs, they represent an important potential research model. For example, they can be used to evaluate how long and effective herd immunity to H5N1 can last.

68. **Is there any risk of transmitting the H5N1 virus from the yolk of the ostrich eggs if they were used for testing and research purposes?**

69. Intact ostrich eggs are normally sterile due to their thick shell wall. If an egg somehow became infected with a bacteria or virus during its development, it would not fully form and this would be plainly evident. The oviduct of the bird where the eggs develop is located very far from the organs and tissues where a respiratory virus would initially take hold. The yolk of the egg is highly enriched with IgY antibodies, which are usually present to protect the developing embryo from infection from a pathogen that may be in the environment of the egg-laying hen. While eggs can be used to propagate attenuated forms of viruses for vaccine development, they have to be injected with the virus through the egg shell. Therefore, the risk of transmission of the H5N1 virus in the yolk of ostrich eggs is extremely remote for testing purposes. Moreover, the yolk could be pasteurized by heat treatment to kill bacteria and viruses, since the IgY antibodies are very resistant to high temperatures.

70. **Would the testing for antibodies against the H5N1 virus from the egg yolks be a good measure of natural or vaccine-induced immunity?**

71. Testing egg yolks from an ostrich hen for the presence of antibodies against a virus like H5N1 would be an ideal method to evaluate natural immunity from a previous infection or immunity that may be produced using a vaccine. This method yield a large amount of antibody with no invasive treatment of the bird to obtain sufficient specimens for testing purposes.

72. **Is there any evidence that vaccine-induced immunity for influenza is superior to natural immunity following recovery from an influenza infection?**

73. Attenuated strains of influenza virus have often been used to elicit immunity in humans and animals. However, the efficacy is usually below 50%. Other methods using RNA-based genetic vaccines for influenza are being developed, but if these work in a manner similar to the COVID-19 mRNA vaccines, then their efficacy and safety are questionable. This is in part due to the fact that usually a single protein of the surface of the virus is usually targeted. With natural immunity, an immune response is generated against potentially all of the proteins of the virus. Moreover, the response is less likely to induce autoimmunity.

PART 5: QUALIFCATIONS AND ACKNOWLEGEMENTS AS AN EXPERT ON IMMUNOLOGY

74. I am a full Professor in the Department of Medicine and Division of Neurology at the University of British Columbia (UBC), where I have been on faculty since 1988. I was one of the founding senior scientists of The Biomedical Research Centre at UBC starting in 1987. I hold B.Sc. Honours (1979) and Ph.D. (1982) degrees in Biochemistry from UBC. My post-doctoral training was at the University of Dundee with Sir Philip Cohen, and at the University of Washington in Seattle with Nobel laureate Dr. Edwin Krebs.

75. I have previously completed several courses in microbiology, immunology and virology during my B.Sc. undergraduate training, and I was a founding and senior scientist for six years at The Biomedical Research Centre, which was an immunology focused institute located at UBC, where I have remained on faculty as a professor in the Department of Medicine for over 36 years. Over a dozen of my scientific research articles have appeared in specialty immunology journals, including the *Journal of Immunology, Blood, Molecular Immunology, Immunology, Infectious Immunology, Cancer Immunology and Immunotherapy*, *International Journal of Vaccine Theory, Practice and Research* and *Vaccines*. These studies document some of my work to understand the molecular mechanisms by which different immune cells, including macrophages, T and B cells become activated.

76. My lectures in formal graduate level courses include teaching in immunology and virology at UBC. I have presented my research at over 100 national and international scientific conferences. As a

faculty member at UBC, I regularly attend grand-rounds and other seminar by speakers on biomedical research on a weekly basis as part of my continuing education as a professor.

77. My UBC lab and spin-out companies have been engaged in the production and testing of over 1,600 antibodies for our internal research programs and for commercial sale for over 28 years. My research has routinely involved for over 36 years, the use of standard and novel immunological techniques developed in my lab, such as Western blotting, dot blotting, antibody microarrays, reverse lysate microarrays and epitope mapping for determination of where antibodies specifically bind their targets.

78. I have authored over 280 scientific publications in peer-reviewed journals and book chapters about cell communication systems important for cell survival and function and implicated in the pathology of cancer, diabetes, neurological and immunology-related diseases. My accolades include the 1993 Martin F. Hoffman Award for Research at UBC, and the 1993 Merck Frosst Canada Prize from the Canadian Society of Biochemistry and Molecular Biology. I was the 2001 Distinguished Lecturer for the Faculty of Medicine at UBC for the Basic Sciences. I have served on grant review panels for the US National Institutes of Health, the Canadian Institutes for Health Research, the National Research Council of Canada, the Michael Smith Health Research Foundation, Genome Alberta, Genome Prairie, the Canadian National Cancer Institute, the Canadian Heart and Stroke Foundation and the American Heart Association, and I have acted as an external reviewer for 22 other agencies including the U.S. National Science Foundation and the Israel Science Foundation. I have also been an external reviewer for over 30 different scientific journals, including those that are focused on immunology and vaccines.

79. I was the founder and president of Kinetek Pharmaceuticals Inc. from 1992 to 1998, and the founder, president and chief scientific officer of Kinexus Bioinformatics Corporation from 1999 to the present. Kinetek was engaged in the development of drugs that inhibit protein kinases, primarily for oncology application and diabetes. Kinexus has produced over 1,600 antibody products against cell regulatory proteins, and employs these antibodies in novel, immunology-based, high throughput methods such as antibody microarrays to monitor cell communication systems in biological specimens from over 2000 academic and industrial clients in over 35

countries over the last 25 years. These antibody products include those that specifically recognize proteins in the SARS-CoV-2 virus as well as host proteins that interact with viral proteins.

80. My expertise has been sought specifically with respect to understanding the immunological mechanisms by which a natural immune response is elicited by SARS-CoV-2, the causative agent of COVID-19, and the immunity afforded by the lipid nanoparticle spike RNA- and adenovirus spike DNA-based COVID-19 vaccines. This has been informed, in part, by clinical studies undertaken in the last 5 years at my company Kinexus in which we have investigated the nature and production of antibodies against the 28 different proteins that are encoded by the SARS-CoV-2 viral genome, by examination of blood samples from over 4,500 participants from across Canada. In this independent ethics review board approved clinical study, I was the lead investigator, and I have been in direct communication with all of the participants. Some of our preliminary findings have already been published in *JCI Insights*, which is the flagship journal of the American Society for Clinical Investigation in 2021.[28] Additional manuscripts that document our SARS-CoV-2 antibody testing study are currently in preparation, and we are now engaged in a second antibody testing study to determine the extent of immunity against the Omicron variants and the duration effectiveness of the COVID-19 vaccines.

81. I have also investigated the use of drugs to inhibit the replication of the SARS-CoV-2 virus in infected host cells. My expertise on enzymes known as protein kinases has permitted me to predict and then verify that compounds that inhibit a protein kinase known as GSK3-beta can block the production of the spike of the virus, and assembly of SARS-CoV-2 virus particles. A provisional patent based on this work has already been filed with the University of British Columbia (UBC) and a manuscript that describes this work has been accepted for publication.[33] I have also spearheaded the development commercial antibodies against many of the SARS-CoV-2 proteins and verified their utility in another published scientific article in the peer-reviewed

[33] Shapira, T., Rens, C., Pichler, V., Rees, W., Steiner, T., Jean, F., Winkler, D.F.H., Sarai, I., Pelech, S., Av-Gay, Y. (2022) Inhibition of glycogen synthase kinase-3-beta (GSK3β) blocks nucleocapsid phosphorylation and SARS-CoV-2 replication. *Molecular Biomedicine.* 3, 43. Retrieved from https://doi.org/10.1186/s43556-022-00111-1

journal Microbial Factories.[34] I am presently working on inhibitory therapeutic peptides that target the NSP15 protein of the SARS-CoV-2 virus.

82. In addition to the direct study of the SARS-CoV-2 and immune responses to this virus in people, I am also a co-founder and vice president of the Canadian Citizens Care Alliance (CCCA) (formerly the Canadian Covid Care Alliance) and very active within this organization. The CCCA's membership include over 600 biomedical scientists, medical doctors and other health practitioners, and the CCCA examines the scientific literature and data from public health authorities to ascertain the threat of COVID-19 and the various strategies available to mitigate its effects. In my capacity as the co-chair of the Scientific and Medical Advisory Committee (SMAC) of the CCCA, I oversee the activities of a panel of 35 scientists and medical doctors that seeks to provide a scientific evidence-based and balanced, independent, but critical assessment of health care policies related to COVID-19. This Committee has met weekly or biweekly over the last three years by Zoom, but typically has daily correspondences by e-mails. The fruits of our efforts are published on the CCCA website (www.canadiancovidcarealliance.org) and in peer-reviewed scientific journals. In particular, I was a coauthor on a CCCA report that critiqued the original 6-months clinical study performed by Pfizer/BioNTech on their BNT162b2 RNA vaccine,[35] a published review about COVID-19 vaccines and pregnancy in the peer-reviewed *Journal of Vaccine Theory, Practice and Research*.[36] In addition, I am a coauthor on several other publications that have been posted on the CCCA website that relate to the manufacturing and

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[34] McGuire, B.E., Mela, J.E., Thompson, V.C., Cucksey, L.R., Stevens, C.E., McWhinnie, R.L., Winkler, D.F.H., Pelech, S., Nano, F.E. (2022) *Escherichia coli* recombinant expression of SARS-CoV-2 protein fragments. *Microbial Cell Factories*. 21:21. https//doi.org/10.1186/s12934-022-01753-0. *bioRxiv* pre-print. Retrieved from https://doi.org/10.1101/2021.06.22.449540)

[35] Bridle, B.W., Martins, I., Mallard, B.A., Karrow, N.A., Speicher, D.J., Chaufan, C., Northey, J.G.B., Pelech, S., Shaw, C.A., Halgas, O. (2021) Concerns regarding the efficacy and safety for BNT162b2 mRNA coronavirus disease (COVID-19) vaccine through six months. www.CanadianCovidCareAlliance.org (January 10, 2022) 1-10 Retrieved from https://www.canadiancovidcarealliance.org/wp-content/uploads/2022/01/Final-CCCA-Critique-Thomas-COVID-19-Vaccines-6-months-NEJM-Jan-10-22.pdf

[36] McLeod, D., Martins, I., Pelech, S., Beck, C., Shaw. C.A. (2022) Dispelling the myth of a pandemic of the unvaccinated. *Int. J. Vaccine Theory Practice Res.* 2(1):267-286.

quality issues associated with the BNT162b2 mRNA COVID-19 vaccine,[37] the efficacy and safety of the BNT162b2 mRNA COVID-19 vaccine based on phase III trial results,[38] and the vaccination of children with COVID-19 vaccines.[39]

83. Recently, I was the leading editor and an author of several chapters in two multi-authors book on COVID-19 that have just been published.[40,41] My *curriculum vitae* is attached as **Exhibit C**, and provides a more detailed account of my professional activities.

84. I believe that my formal training, experience and published research, demonstrates my expertise in immunology, and my recent activities specifically related to SARS-CoV-2 over the last three years, places me in an excellent situation to comment upon related matters such as immunity to the influenza virus. I have been sought as an Expert Witness for several court cases with respect to natural and vaccine-induced immunity with respect to COVID-19.

85. A listing of some court cases related to COVID-19 matters that I have been asked to furnish sworn affidavits or file expert reports includes, but is not limited to:

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[37] Gutchi, M., Speicher, D. J., Natsheh, S., Oldfield, P., Britz-McKibbon, P., Palmer, M., Karrow, N., Massie, B., Mallard, B., Chan, G. Pelech, S. (2022) An independent analysis of the manufacturing and quality control issues of the BNT162b BioNTech/Pfizer vaccine identified by the European Medicine Agency. www.Canadian Covid Care Alliance.org (October 29, 2022) 1-5 https://www.canadiancovidcarealliance.org/wp-content/uploads/2022/11/22OC29_EMA-Analysis-of-BNT162b-Manufacture.pdf

[38] Bridle, B.W., Martins, I., Mallard, B.A., Karrow, N.A., Speicher, D.J., Chaufan, C., Northey, J.G.B., Pelech, S., Shaw, C.A., Halgas, O. (2021) Concerns regarding the efficacy and safety for BNT162b2 mRNA coronavirus disease (COVID-19) vaccine through six months. www.CanadianCovidCareAlliance.org (January 10, 2022) 1-10 https://www.canadiancovidcarealliance.org/wp-content/uploads/2022/01/Final-CCCA-Critique-Thomas-COVID-19-Vaccines-6-months-NEJM-Jan-10-22.pdf

[39] Payne, E., Rennebohm,R., Bridle, B., Mallard, B., Karrow, N., Massie, B., Northey, K., Shoemaker, C., Pelech, S., Chaufan C., McLeod, D., Hardie, J., Pinto, C., Britz-McKibbin, P., Shaw, C. (2022) Request to halt vaccinations of children. www.CanadianCovidCareAlliance.org (July 14, 2022) 1-28 https://www.canadiancovidcarealliance.org/wp-content/uploads/2022/07/CCCA-Halt-vaccination-of-children-Officials-Letter-Jul-14-22.pdf

[40] (2024) Down the COVID-19 rabbit hole: Independent scientists unmask the pandemic. (ed. S. Pelech & C. Shaw) Skyhorse Publishing, Inc., New York, USA.

[41] (2025) COVID-19 Pandemonium: A pandemic of ignorance, fear and greed. The capture of our institutions. Ekstasis Press, Victoria, B.C., Canada

a.	COURT FILE NUMBER	210600780
	COURT	COURT OF QUEEN'S BENCH OF ALBERTA
	JUDICIAL CENTRE	LETHBRIDGE
	APPLICANT	HAYLEY NASSICHUK-DEAN
	RESPONDENT	UNIVERSITY OF LETHBRIDGE
		Cross-examination Feb. 16, 2022
b.	COURT FILE NUMBER	T-1694-21
	COURT	FEDERAL COURT OF CANADA (Trial Division)
	APPLICANT	DAVID LAVERGNE-POITRAS
	RESPONDENTS	ATTORNEY GENERAL OF CANADA (Minister of Public Services and Procurement) – and – PMG TECHNOLOGIES INC.
		Cross-examination September 8, 2022
c.	COURT FILE NUMBER	T-168-22-ID-1
	COURT	FEDERAL COURT OF CANADA
	APPLICANTS	THE HONOURABLE A. BRIAN PECKFORD, LEESHA NIKKANEN, KEN BAIGENT, DREW BELOBABA, NATALIE GRCIC, AND AEDAN MACDONALD
	RESPONDENTS	THE MINISTER OF TRANSPORT and THE ATTORNEY GENERAL OF CANADA
		Cross-examination May 13 and 16, 2022
d.	COURT FILE NUMBER	2101-13202
	COURT	COURT OF QUEEN'S BENCH OF ALBERTA
	JUDICIAL CENTRE	CALGARY
	APPLICANTS	DR. ERIC T. PAYNE, DR. JOANNE J. MOSER, DR. DAVID W. L. LOEWEN and DR. GREGORY CHAN
	RESPONDENTS	ALBERTA HEALTH SERVICES, DR. VERNA YIU IN HER CAPACITY AS CHIEF EXECUTIVE OFFICER OF ALBERTA HEALTH SERVICES, DR. JOHN T. CHMELICEK IN HIS CAPACITY AS POST GRADUATE PROGRAM DIRECTOR, DEPARTMENT OF FAMILY MEDICINE, UNIVERSITY OF ALBERTA -and- THE UNIVERSITY OF ALBERTA
e.	COURT FILE NUMBER	CV-21-00670360-0000
	COURT	SUPERIOR COURT OF JUSTICE ONTARIO
	APPLICANTS	SARAH HARJEE, EVAN KRAAYENBRINK, HIBAH AOUN, SARAH LAMB, SAM SABOURIN, JACKIE RAMNAUTH, MARK MCDONOUGH -and- LINDA MCDONOUGH
	RESPONDENT	HER MAJESTY THE QUEEN IN RIGHT

OF THE PROVINCE OF ONTARIO
Cross-examination April 28 & May 5, 2022

f.	COURT FILE NUMBER	FDF-443-19
	COURT	COURT OF QUEEN'S BENCH OF NEW BRUNSWICK
	JUDICIAL CENTRE	FAMILY DIVISION JUDICIAL DISTRICT OF FREDERICTON
	APPLICANT	VICTORIA LYNN MITHAM
	RESPONDENT	BRADLEY SCOTT FOLLETT
g.	COURT FILE NUMBER	72/2022
	COURT	HIGH COURT OF SOUTH AFRICA
	JUDICIAL CENTRE	FREE STATE DIVISION, HELD AT BLOEMFONTEIN
	APPLICANTS	SOLIDARITY obo MEMBERS, SOLIDARITY YOUTH Obo MEMBERS, JOANNA STANDER, SHANIQUE PIENAAR, ALICE FLORENCE MARINA STANDER - and - ANNELI BOTHA
	RESPONDENTS	CHAIRMAN OF THE COUNCIL OF THE UNIVERSITY OF THE FREE STATE– and – THE UNIVERSITY OF THE FREE STATE

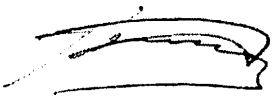
h.

h.	COURT FILE NUMBERS	C.A.C.V.3903of202 C.A.C.V.3904of2021 C.A.C.V.3908of2021
	COURT	COURT OF APPEAL FOR SASKATCHEWAN ON APPEAL FROM THE QUEEN'S BENCH (FAMILY LAW DIVISION)
	JUDICIAL CENTRE	JUDICIAL CENTRE OF SASKATOON DIV. No. 625 of 2012
	APPLICANT	OLENA MYKOLAYIVNA SCHEMENAUER
	RESPONDENT	EVAN JOSEPH SCHEMENAUER
i.	COURT FILE NUMBER	FD 19-01-22922
	COURT	COURT OF QUEEN'S BENCH (FAMILY DIVISION)
	JUDICIAL CENTRE	WINNIPEG CENTRE
	APPLICANT	JORDAN SARAH CURÉ
	RESPONDENT	KENNETH PETER TYSON CURÉ
j.	COURT FILE NUMBER	E59176
	COURT	SUPREME COURT OF BRITISH COLUMBIA
	JUDICIAL CENTRE	NEW WESTMINISTER
	APPLICANTS	VICTORIA LARA DRAPER AKA VICTORIA LARA DRAPER SMITH

	RESPONDENT	MATTHEW LAWRENCE NEALE SMITH
k.	COURT FILE NUMBER	E17315
	COURT	SUPREME COURT OF BRITISH COLUMBIA
	JUDICIAL CENTRE	CHILLIWACK REGISTRY
	APPLICANT	DALE JAMES HOOGENDOORN
	RESPONDENT	KATIE NADINE HOOGENDOORN
		Testimony Feb. 17, 2022.
l.	COURT FILE NUMBER	FC-13-917-02
	COURT	SUPERIOR COURT OF JUSTICE FAMILY COURT BRANCH
	JUDICIAL CENTRE	OSHAWA REGISTRY
	APPLICANT	KAREN DIAZ (BOL)
	RESPONDENT	BRENT BOL
m.	COURT FILE NUMBER	2022/1456 P
	COURT	HIGH COURT OF IRELAND
	APPLICANTS	DAVID EGAN AND SHARON BROWNE AND EMMANUEL LAVERY
	RESPONDENTS	MINISTER FOR HEALTH, AN TAOISEACH, AND HSE
n.	ARBITRATION	
	EMPLOYER	HUMBER RIVER HOSPITAL
	UNION	NATIONAL ORGANIZED WORKERS UNION
		Grievances: NOWU Policy Service #170,2021 (All Bargaining Units) Covid Directive 6, NOWU Policy Service #01,2022 (All Bargaining Units) Covid Policy, 2022-NOWU-Clerical-55-HRH; Grievance of Gail Ackie Cross-examination Feb. 20, 22 & 29, 2023
o.	COURT FILE NUMBER	No. S2110229
	COURT	SUPREME COURT OF BRITISH COLUMBIA
	JUDICIAL CENTRE	NEW WESTMINISTER
	APPLICANTS	CANADIAN SOCIETY FOR THE ADVANCEMENT OF SCIENCE IN PUBLIC POLICY and KIPLING WARNER
	RESPONDENT	DR. BONNIE HENRY IN HER CAPACITY AS PROVINCIAL HEALTH OFFICER FOR THE PROVINCE OF BRITISH COLUMBIA
p.	COURT	ONTARIO
	APPLICANT	VALERIE ALAGNA
	RESPONDENT	HAMILTON HEALTH SCIENCES CORPORATION

q.	DISCIPLINARY HEARING	
	CASE	2021-AF-01136
	COLLEGE	COLLEGE OF NURSES OF ONTARIO
	DEFENDENT	SARAH A. CHOUJOUNIAN-ABULU
		Cross-examination April 13 & 14, May 19, June 9 & 30, July 8, 2023
r.	DISCIPLINARY HEARING	
	COLLEGE	BC COLLEGE OF NURSES AND MIDWIVES
	DEFENDENT	SEAN TAYLOR
		Cross-examination July 19 & 20, 2023
s.	DISCIPLINARY HEARING	
	CASE	CPSID 17223; IC2021-0481; IC2021-0535
	COLLEGE	COLLEGE OF PHYSICIANS AND SURGEONS OF BC
	DEFENDENT	DR. CHARLES HOFFE
t.	COURT FILE NUMBER	CV-22-0069-1880-0000
	COURT	ONTARIO SUPERIOR COURT OF JUSTICE
	APPLICANT	DR. BYRAM BRIDLE
	RESPONDENTS	UNIVERSITY OF GUELPH, JEFFREY WICHTEL, LAURIE ARNOTT, CHARLOTTE YATES, SCOTT WEESE, GLEN PYLE, ANDREW PEREGRINE, DOROTHEE BIENZLE, AMY GREER, DAVID FISMAN, NICK DULEY, JANE OR JOHN DOE JUNIOR SCIENTIST
u.	COURT	COURT OF KING'S BENCH ALBERTA
	JUDICIAL CENTRE	GRANDE PRAIRIE
	APPLICANT	ANNETTE LEWIS
	RESPONDENTS	ALBERTA HEALTH SERVICES AND REDACTED PARTIES
v.	COURT FILE NUMBER	SCBC Action E222370
	COURT	SUPREME COURT OF BRITISH COLUMBIA
	JUDICIAL CENTRE	VANCOUVER REGISTRY
	APPLICANT	TRICIA MARIE BARR ALLARD
	RESPONDENT	PATRICK JAMES ALLARD
w.	DISCIPLINARY INVESTIGATION	
	CASE	IC 2022
	COLLEGE	COLLEGE OF PHYSICIANS AND SURGEONS OF BC
	DEFENDANT	DR. SOFIA T. BAYFIELD

Respectfully submitted by,



Steven Pelech, Ph.D.

Professor,
Department of Medicine,
University of British Columbia

President and Chief Scientific Officer,
Kinexus Bioinformatics Corporation

Vice-President, and Co-Chair,
Scientific and Medical Advisory Committee,
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THE UNIVERSITY OF BRITISH COLUMBIA

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spelech@mail.ubc.ca

Date: 12 February 2025

Re: Expert Report – Risk of H5N1 influenza transmission from Ostriches located at Universal Ostrich Farms, Ltd. – Analysis of natural immunity

For the case involving Universal Ostrich Farms Ltd. represented by Mr. Michael Carter of Cleveland & Doan Barristers & Solicitors

PART 1: DESCRIPTION OF SCOPE OF THE QUESTIONS TO BE ADDRESSED

1. I have previously provided an expert report dated January 29, 2025, in response to questions that were put to me by the firm of Cleveland & Doan related to the flock of ostriches (Herd) located at the Universal Ostrich Farms Ltd. (UOF) near Edgewood, B.C. and the risks of transmission of the H5N1 strain of influenza, which is responsible for the current waves of highly pathogenic avian influenza (HPAI). I am responding in this follow-up expert report on the concerns raised by Dr. Cathy Furness of the Canadian Food Inspection Agency (CFIA) in her January 30, 2025, affidavit, and new questions that have been asked of me by Cleveland & Doan in their February 8, 2025, letter (Exhibit A). In addition, I am providing results of testing for antibodies against the H5 hemagglutinin and N1 neuraminidase influenza viral proteins present in the yolk of ostrich eggs recovered in the summer of 2024, which is indicative of the ostriches' previous state of natural immunity against the avian H5N1 virus.

2. In particular, in correspondence (Exhibit A) that I received in the e-mail from Mr. Carter on February 8, 2025, I was requested to address the followings questions:

i. What is the likelihood that the ostriches presently are transmissible for H5N1 to each other and wild migratory birds such as ducks?

ii. What is the risk that ostriches may be asymptomatic and still actively replicating, mutating and shedding the virus?

iii. If there is no circulating virus in the ostriches, what is the risk of the following occurring:

a. the ostriches facilitating mutation of the virus;

b. the virus being transmitted to human;

c. the virus serving as precursor to a human flu pandemic;

d. the ostriches becoming infected with more than one subtype of the virus, which may allow HPAI variants to mix with other circulating influenzas creating new combinations; and

e. the ostriches contributing genetic mutations to AI viruses that may increase viral adaptability to mammalian hosts.

3. I understand that having been named as an expert witness by Universal Ostrich Farms Ltd., and having read the Code of Conduct for Expert Witnesses set out in the schedule to the Federal Court Rules, that I am bound to these rules, including in the preparation of this report.

PART 2: COLLECTION OF FACTS IN THE PREPARATION OF THIS EXPERT REPORT

4. My opinion on these matters is informed in part on the following facts that were conveyed by Mr. Carter on January 27th, 2025, as outlined in my January 29, 2025, expert report and new information provided in Mr. Carter's February 8, 2025 letter, which includes:

i. There have been no additional ostrich deaths from H5N1 type symptoms; and.

ii. The ostriches are not showing any signs of illness and appear healthy.

5. In addition, I have considered the findings from my own testing through my company Kinexus Bioinformatics Corporation (Vancouver, B.C.) for antibodies against the H5 hemagglutinin and N1 neuraminidase influenza viral proteins present in the yolks of 18 ostrich eggs produced at the UOF site in the summer of 2024.

6. Furthermore, I have viewed several media interviews[1,2,3] with UOF owners Mr. Dave Bilinski and Ms. Karen Espersen, and her daughter Ms. Katie Pasitney, have provided additional details regarding the history and status of the UOF ostriches.

7. My own training in immunology and virology and personal experience and understanding of these fields affords me the ability to consider and weigh these issues in a knowledgeable way and offer a qualified expert opinion. My history and my *curriculum vitae* were provided in my January 29, 2025, expert report.

PART 3: RESPONSE TO QUESTIONS FROM CLEVELAND & DOAN

8. My January 29, 2025, expert report already provides detailed information about the history of the influenza virus, and its impacts on human and animal health, and the importance of natural immunity and vaccine-induced immunity in controlling its spread in vulnerable populations. A brief description was given of the tests to confirm an active viral infection: namely the Polymerase Chain Reaction (PCR) genetic test; the Rapid Antigen test (RAT), which detects viral proteins; and the live culture test, in which the specimens of the viral are incubated with live cells in culture or fertilized eggs to evaluate cell killing or developmental defects. To monitor a past infection with a virus following recovery, tests to detect the levels of specific antibodies against the pathogen in blood, saliva and other specimens are most commonly used.

9. A brief description of the composition and function of the cells of the immune system is also offered in my January 29, 2025 expert report. In particular, antibodies (also known as immunoglobulins (Ig)) are a significant part of the main defense of the immune system against infective pathogens, and these are produced by receptive B lymphocytes. In birds, reptiles and amphibians, the IgY class antibodies are most common, and can be concentrated in the yolk of

[1] https://www.ctvnews.ca/vancouver/article/bc-farm-fights-order-to-cull-ostrich-herd-after-2-birds-test-positive-for-avian-flu/

[2] https://www.rebelnews.com/power_hungry_feds_order_culling_of_ostrich_farm?utm_campaign=dh_ostrichupdate_012725&utm

[3] https://www.youtube.com/live/dM5xHTKSzV0

their eggs. Antibodies lock on to foreign proteins and other structures found in viruses, bacteria and fungi, and interfere with their ability to infect cells and also recruit other immune cells of the innate and adaptive immune systems to attack the pathogens or body cells that are infected with the pathogen. Measurement of the levels of specific antibodies in specimens from an animal can provide information whether it has been previously exposed to a pathogen and has a degree of protective immunity.

10. **What is the risk that the ostriches may be asymptomatic and still actively replicating, mutating and shedding the virus?**

11. Birds can become infectious about a day before they manifest any symptoms, and they are thought to be typically able remain infectious for five to seven days after the appearance of flu symptoms. Since recovery from symptoms may be up to two weeks in rare cases, in principle, it is possible that a bird could be infectious up to two weeks in limited cases. As the symptoms of influenza largely reflect the body's protective response to the infection, a subsiding of the signs of illness usually reflects the complete cleansing of the body of the infection with eradication of the influenza virus. As the viral load is reduced, the chances of transmission of the virus also decline.

12. Due to immune attack, the viral particles that may be released from a host body are also compromised, since they are likely coated with antibodies that stick on to virus and have experienced damage that will render them less active. Thus, towards the end of an infection, along with a reduced viral load, the virus particles are less infectious. Should they manage to be shed and picked up by a new host, the antibodies on the viral particles would rapidly trigger an immune response by the new host's innate immune system.

13. It is important to understand that viruses are not technically "living" since they absolutely need a host cell in which to replicate. By definition, the smallest unit of a living organism is a cell. Viruses are cellular parasites that absolutely require a suitable host cell for their replication. Therefore, while viruses have been termed as "live" or "dead", it is better to consider them as active or functional, if they are replication capable, and inactive or non-functional if they are not.

14. The ability to establish a successful infection in a host is dependent on each step of a chain of independent events occurring in the proper order for a successful infection that will lead to propagation and transmission of a replication competent pathogen like a virus. These include:

    a. Link 1 – Sufficient dose of an infectious virus to be infective in the host, which is dependent the virus encountering a favorable environment (fertile ground) in the host and in part on the pre-existing immunity in the host. The immune system can thwart the reproduction and spread of a virus at the earliest stages on an infection.

    b. Link 2 - The virus has to be fully functionally active. It has to be cell penetrating, usually by initially binding to a specific host receptor, and replication competent, and achieve a critical mass of reproduced virus particles before any visible of the infection are manifested as symptoms.

    c. Link 3 – The virus has to be able to have a portal of escape from the host. The symptoms of an infection, such coughing, sneezing, production of phlegm, post-nasal drip and other secretions are mechanisms by which a virus may leave the body and infect a new host.

    d. Link 4 – The mode of transmission is also critical, and may require close proximity or even direct contact. The environment outside of a host body can be hostile and limit the survival of the virus. An Influenza particle may remain suspended temporarily in an aerosol form in tiny droplets. However, larger droplets (larger than 60 microns) quickly drop to the ground within a meter, and smaller droplets undergo drying out, and reduction in size with evaporation. The influenza virus is about 0.14 microns in size, and more sensitive to damage in the absence of water following evaporation.

    e. Link 5 – The virus has to have a portal of entry in the body of a suitable host to gain access to the fertile ground. Note that being very large birds, with their heads held high, ostriches would be much less likely to breathe in a virus particle than an animal like a flightless chicken whose head is closer to the ground.

    f. Link 6 – The virus has to also find a susceptible host. The virus needs to be well adapted to the physiology of the host, including specific proteins that act as receptors and intracellular

proteins that can replicate and package the virus. However, the health status of the host is also critical, and this can be influenced by wide range of factors, including age, diet, nutrition, life-style (such as access to natural conditions, low density, ability to exercise), stress, comorbidities and prior infection that can increase immunity.

15. Critical to the development of an infection, the six links constituting the Chain of Infection must be joined in the order of; Sufficient Dose of an Infectious Pathogen → Existence of a Viable Infectious Pathogen → A Portal of Escape → A Mode of Transmission → A Portal of Entry → A Susceptible Host. Breaking this chain by removing or incapacitating one of the links prevents the transmission of an infectious disease. Although each link is critical, the most significant one regarding the transmission of an infectious disease is host susceptibility.

16. The clinical importance of this conclusion is more readily appreciated by focusing on host resistance rather than host susceptibility. This allows the probability of an infectious disease occurring to be represented by the following equation.[4]

$$\text{Infection} = \frac{\text{Virulence of the Pathogen x Dose of the Pathogen}}{\text{Host Resistance}}$$

17. This equation illustrates two factors relevant to the transmission of all infectious diseases. First, infection is not an inevitable outcome of exposure to a pathogen but depends on an interrelated series of events constituting the Chain of Infection. Second, host resistance is more pertinent to the development of an infectious disease than are the specific characteristics of a potential pathogen.[5] The significance of this factor is appreciated when the heterogeneous nature of a population is considered.

18. The concept of asymptomatic transmission is that an individual who has no outward signs or symptoms of an infectious disease can still transmit it. In addition, it has been proposed that an

[4] Runnels, R.R. (1984) Infection control in the wet finger environment. Salt Lake City: Publishers Press.

[5] Shulman, T.S. (1992) The biologic and clinical basis of infectious diseases. 4th edition. Toronto: W.B. Saunders.

individual at the early stages of an infectious disease may also be able to transmit that disease. The idea of asymptomatic transmission has been a major driver of policies, procedures and mandates associated with infections and has been a feature in many of the public health policies during the pandemics like COVID-19 despite little evidence to support this contention. Much has since been learned about respiratory virus transmission from the COVID-19 pandemic, and since the SARS-CoV-2 virus and the influenza virus are RNA viruses of the same size with many shared characteristics, the lessons learned from either of these viruses is very instructive with respect to both of their transmissions.

19. The Chain of Infection dictates that for infection to occur, a sufficient dose of viable respiratory virus like influenza must be transmitted through the air from an infectious carrier to a potentially susceptible new host. It is the force associated with the symptoms of coughs and sneezes that expels infectious doses of a respiratory virus from the respiratory tract of the primary host with sufficient velocity to be transmitted as aerosols through the air and be inhaled by a new host where they must overcome that individual's natural defenses (intact mucous membranes) and immunological responses. The Chain of Infection reveals that an individual might harbor a virus and have nonexistent-to-mild non-specific symptoms, but unless the viable virus is expelled in sufficient amounts by sneezing or coughing and overcomes the resistance of a new host, the potential for transmission does not practically exist. The only exceptions would be species of intermediate hosts that are carriers that do not get sick from their infection, but aid in the transmission of the virus.

20. In January 2020, before the onset of the COVID-19 pandemic, Dr. Anthony Fauci, the director of the US National Institute of Allergy and Infectious Diseases at that time, supported this concept when he said, "*In all the history of respiratory borne viruses of any type, asymptomatic transmission has never been the driver of outbreaks. The driver of outbreaks is always a symptomatic person.*"[6] Further evidence on the low level of asymptomatic transmission for SARS-CoV-2 was provided by Dr. Maria Van Kerkhove, head of WHO's emerging diseases and zoonosis

[6] U.S. Department of Health and Human Services. (2020) Update on the new coronavirus outbreak first identified in Wuhan, China. YouTube. Retrieved from https://youtube.com/watch?v=w6koHkBCoNQ&t=2642s

unit, on June 8, 2020, when she said that, "*from the data we have, it still seems to be rare that an asymptomatic person actually transmits onward to a secondary individual*." She continued to say that "*We have a number of reports from countries who are doing very detailed contact tracing. They're following asymptomatic cases. They're following contacts. And they're not finding secondary transmission onward. It's very rare*."[7]

21. In some species, it is possible that an animal may become infected with a pathogen and exhibit minimal symptoms due to the ability of that species to have adapted to that pathogen in its evolution. For example, *Yersinia pestis*, which is the bacteria responsible for the Black Death in Europe starting in 1346, is extremely deadly in humans through the production of a toxin. However, in the rats that were infected with the bacteria at that time, it had minimal effects on these rodents. However, fleas that infested these rats, which were also insensitive to the bacterial, bit and also transmitted it to humans. Rats and fleas lack an enzyme found in the blood of humans that is required to activate the toxin produced by *Yersinia pestis*, and so they are carriers of *Yersinia pestis* but not victims. **However, chickens and ostriches have a significant risk of mortality if they contract avian influenza, so they do not as species appear to have evolved the ability to build up a significant viral load for transmission of influenza without manifestation of obvious symptoms.** Birds that do not develop symptoms most likely have a prior degree of natural immunity from previous exposure, although genetics may also play a role.

22. **What are the risks if there is no functional virus circulating in the ostriches?**

23. As mentioned above, it is better to consider viruses as active or functional, if they are replication capable, and inactive or non- functional if they are not.

24. As well, as the symptoms of influenza largely reflect the body's protective response to the infection, a subsiding of the symptoms usually reflects the complete cleansing of the body of the infection. This includes not just the active, functional virus particles, but shortly thereafter the

[7] Feuer, W., Higgins-Dunn, N. (2020) "Asymptomatic spread of coronavirus is very rare," WHO says. CNBC. https://www.cnbc.com/2020/06/08/asymptomatic-coronavirus-patients-arent-spreading-new-infections-who-says.html

remnants of inactive, non-functional virus too. By three weeks following recovery from any symptoms of an influenza infection, there has been complete elimination of the virus and its debris from the body and establishment of strong natural immunity. The likelihood of there currently being functional virus circulating in the UOF herd is negligible.

25. Once a body is cleansed of an infection there is no practical risk of any of the following occurring:

    a. the ostriches facilitating mutation of the virus;
    b. the virus being transmitted to humans;
    c. the virus serving as precursor to a human flu pandemic;
    d. the ostriches becoming infected with more than one subtype of the virus, which may allow HPAI variants to mix with other circulating influenzas creating new combinations; and
    e. the ostriches contributing genetic mutations to AI viruses that may increase viral adaptability to mammalian hosts.

26. **What is the ability of ostriches to facilitate mutations of influenza virus?**

27. In the following paragraphs of Part 3, I have discussed whether there are risks while the influenza virus is active or functional, which is not the case now with the UOF ostrich herd. It should be clear that I do not believe the current UOF ostrich herd presently or in the future pose any of the following risks, which were already very remote even the birds were infected. The CFIA appears to be concerned about possible mutation of the H5N1 virus in the ostriches that may allow it to more readily infect and cause serious disease in humans and livestock as well as wild animals. It must be emphasized due to a wide variety of factors as explained in the rest of this section that such a scenario is an extremely remote possibility.

28. Mutation is an ongoing process in living organisms and viruses, and it is the means by which the diversity of all life on this planet has evolved over the last 3 and a half billion years. Only very rarely, under the right conditions such as a supportive environment, does a mutation confer an advantage to an organism or virus. The most common means by which mutations occur is during the replication of a cell or virus during the reproduction of its genome to create progeny. Like

other viruses, with each replication cycle of an influenza virus in a host, there is the potential to introduce mutations in the genome structure of the virus and its encoded proteins. This most commonly arises from the error rate in the RNA polymerase enzymes that produce copies of the RNA in the genome, which is itself segregated into 8 separate chromosomes. The vast majority of these introduced mutations are actually deleterious or inconsequential to the production of functional virus particles. In very rare circumstances, the mutation may increase infectivity, or evasion of the immune system, but extremely rarely does it increase the virulence of the virus. An increase in viral virulence is actually deleterious to the longer-term propagation of the strain of the virus, since killing the host limits transmission. A host that is minimally sick from an infection is much more likely to be transmitted other hosts. This is exactly what happened during the COVID-19 pandemic, when the more virulent Wuhan SARS-CoV-2 strain was eventually out-completed by the more infectious and milder Omicron variants.

29. There is no reason to believe that the mutation rate of the influenza virus in an infected ostrich would be any different than in a wild duck or farmed chicken. The mutation rate is dependent on the RNA polymerase encoded by the influenza virus genome itself. The opportunity that such chance mutations with a gain-of-function would arise in a flock or herd is very dependent on the size of group of infected animals, how confined in a high density they may be to increase the chances of spread (*e.g.,* seen with cooped up chickens) or mobile to increase the zone of transmission (*e.g.,* seen with wild migrating ducks and geese). The size of the ostrich herd at UOF, even with 390 animals, is relatively small when compared to most flocks of domestic poultry or wild birds that can number of the tens of thousands. An isolated farm with confined flightless birds poses an inconsequential any risk to the overall spread of the H5N1 virus.

30. Because the genome of the influenza virus is separated into 8 small chromosomes, it is theoretically feasible that if different strains of the influenza virus happened to co-infect the very same host cells, there could be mixed packaging of the genomes of these viruses to produce hybrid viruses. This could in principle permit cross-over for infectivity to some other species. However, the chances of this happening are very low, because an active infection with one strain of the virus will induce the upregulation of innate and adaptive immune systems to fight any

other respiratory virus infections, which would make it much harder for second, likely weaker strain to flourish in the host. This is demonstrated by the 97% reduction in the cases of influenza in the human population while SARS-CoV-2 was very prevalent in 2020 and 2021.

31. While it is feasible for a pathogenic virus to evolve through accumulation of mutations of its genome to infect a new host species, this is more difficult the greater the evolutionary difference in the host species. This is rare for a virus, because it has a limited number of genes to start with, and they encode proteins that are already highly optimized for the species that they normally infect. These viral proteins have to be well matched for the host's proteins to successfully gain entry into the cells, hijack the cellular machinery that is normally used to replicate the cell into making viral proteins instead, and allow assembly of complete infectious viral particles that can leave the cell.

32. The rare jumping of a virus from one host species to another host species is possible, and further mutations in the virus could increase its infectivity and ability to evade the immune system, this is also usually accompanied by a reduction in its virulence (*i.e.,* decreasing morbidity and mortality). There are plenty of examples of this, including the viruses that cause common colds and flues that while inconvenient, rarely require hospitalization and resolve with full recovery. Moreover, it should be appreciated that there are hundreds of thousands of different viruses that are believed to infect mammals, but only about a hundred are actually pathogenic in humans. Again, this is because of the difficulty for viruses to cross species, which is called zoonosis if it is able to cross over to humans, and the highly robust immune defenses that have evolved in animals.

33. **What is the likelihood of ostrich transmission of avian influenza to humans?**

34. The transmission of avian influenza from chickens to humans is well documented. Any persons working with an animal that is infected with this virus will be exposed to the virus and likely mount an immune response usually without the development of symptoms of disease. However, as mentioned in paragraphs 14 to 20, the chain of infection must be fully supported to allow transmission of an infectious pathogen to the point where it can cause sickness.

35. The development of immunity against a viral or bacterial pathogen through vaccination, which usually does not cause sickness in the recipient, is ample demonstration that low level infection with a pathogen is sufficient to evoke substantial protection against future infections with a more virulent strain of the pathogen. Moreover, exposure to a milder form of a virus, for example such as cow pox from handling cows as documented for milk maids, can actually provide immunity to more lethal strains in human, such as small pox in this case.

36. The question is really whether the avian flu from a domesticated animal is likely to cause illness in a human. There is a much greater chance that a highly pathogenic influenza virus that could seriously affect humans will emerge from a mammalian host such as pigs, cattle or minks, which have already been also been shown to become infected with the avian H5N1 variants of influenza. The physiology at the cellular levels of humans, also being a mammal, is much more different in birds. The risk of transmission of influenza that causes sickness in humans from a bird host such an ostrich is substantially lower. Ostriches have been a distinct species for over 120 million years, whereas humans and chimpanzees evolved from a common ancestor only about 7.5 million years ago,

37. Moreover, it is more likely that a more virulent strain of influenza would emerge by mutation from influenza strains that already infect humans. Typically, about 5 to 10% of adults and 20 to 30% of children in Canada are infected annually and have flu-like symptoms.[8] In the brief 2022-2023 flu season, 97% of the confirmed influenza cases were influenza A, and about 3,500 death were reported from influenza and pneumonia across Canada.[8] More recently, according the latest reports from the US Center for Disease Control (CDC), during this winter season there has been at least 24 million illnesses, 310,000 hospitalizations and 13,000 death in the US from the

[8] Hawthorne, K. (2024) Influenza in Canada: Stat, impacts and resources. Healthing.ca. Retrieved from https://www.healthing.ca/diseases-and-conditions/influenza-flu/influenza-in-canada-stats-impact-and-resources

flu.[9] This would correspond to a case fatality rate of about 0.05% from what is primarily H1N1 and H3N2 influenza strains.

38. Furthermore according the CDC,[10] in the US there have been a total of 67 confirmed human cases of the avian bird flu, and only 1 death in a 65-year-old that had infected chickens in their backyard, but also had pre-existing health complications. In Canada, there is only single case of a 13-year-old girl with a mild asthma history living in BC that became seriously ill with H5N1, and there is no explanation for how this young female contracted the disease.[11] There are no known cases of human-to-human H5N1 transmission.[10] The majority of H5N1 cases in humans appear to be from working on farms with cattle slightly more than with poultry, and the illnesses were usually mild.[12]

39. **Can the H5N1 virus serve as a precursor to a pandemic in humans?**

40. It is unlikely that the H5N1 virus could mutate directly from birds into a form that causes a serious disease pandemic in people. The H1N1 strain that infects people and is responsible for past human pandemic such as the 1918 Spanish Flu, shares the N1 neuraminidase protein. However, the H5 hemagglutinin protein has not previously been associated with major pandemics in humans in the past century, whereas the H1, H2 and H3 forms have.

41. The hemagglutinin protein is important in the binding of the influenza virus receptors on host cells. Avian influenza viruses use α2-3-linked sialic acids as their preferred receptors, but human-transmissible strains prefer α2-6-linked sialic acids, which are found on the surface of human

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[9] Weekly US influenza surveillance report: Key updates for Week 5, ending February 1, 2025. (2025) CDC FluView. Retrieved from https://www.cdc.gov/fluview/surveillance/2025-week-05.html

[10] H5 bird flu: Current situation (2025). Retrieved from https://www.cdc.gov/bird-flu/situation-summary/index.html

[11] Jassem, A.N., Roberts, A., Tyson, J., Zlosnik, J.E.A., Russell, S.L., Caleta, J.M. *et al.* (2024) New England Journal of Medicine. Doi:10.1056/NEJMc2415890. Retrieved from https://www.nejm.org/doi/full/10.1056/NEJMc2415890

[12] Garg, S., Reinhart, K., Couture, A., Kniss, K., Davis, T., *et al.* (2024) New England Journal of Medicine. Doi: 10.1056/NEJoa2414610. Retrieved from https://www.nejm.org/doi/full/10.1056/NEJMoa2414610

cells in the airways and lungs.[13] Deep mutation scanning of H5 hemagglutinin binding to α2-6-linked sialic acids using pseudoviruses has shown that it is possible to improve binding to α2-6-linked sialic acids, the stability of the H5 3D structure, and reduce immunogenicity with pre-existing neutralizing antibodies. However, this was restricted to about a dozen mutations out of 10,773 possible mutations in H5. Consequently, the ability of the H5N1 to mutate into a contagious and virulent influenza strain for human-to-human transmission remains very low. It is much more likely that the next influenza pandemic will emerge from the existing strains that are already optimized through evolution to infect mammals.

42. **Could co-infection of ostriches with two different strains of influenza result in human pathogenic avian influenza variants?**

43. This question has already been addressed in paragraph 30. While theoretically possible, this would be very unlikely. A very sick person with a different influenza strain would have to be attending to a very sick ostrich that had H5N1. This is highly unlikely with a small number of staff at the UOF site and the limited number of birds in the flock that would be sick, especially after acquisition of natural immunity against H5N1 virus. That sick person would most likely have an H1N1 or H3N2 influenza strain, and these strains weakly bind to the α2-3-linked sialic acids found in birds that serve as receptors for the virus. Most combinations of the packaging of the 8 different chromosomes of the influenza genome into a viral particle would create less virulent forms for both ostriches and humans, since these would have been previously optimized to work on the host cells from the species for which they are derived.

44. **Could the mutation of the H5N1 virus in ostriches increase viral adaptability to humans?**

Ostriches are as evolutionarily distant from humans as are chickens and ducks. There is no reason to expect that the mutation of the H5N1 virus in ostriches would make it easier to infect humans

[13] Dadonaite, B., Ahn, J.J., Ort, J.T., Yu, J., Furey, C., *et al*., (2024) Deep mutational scanning of H5 hemagglutinin to inform influenza virus surveillance. PLoS Biol. 22(11):e3002916. doi: 10.1371/journal.pbio.3002916. Retrieved from https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3002916

than the mutations transpiring in chickens or ducks. On the one hand, should the H5N1 virus happen to mutate to increase its binding to humans, it would be less efficient in binding to other ostriches and other domestic or wild fowl. On the other hand, if the virus mutated in the ostrich to increase its binding to other birds, it would less efficiently infect mammals. It is much more likely that further mutation of the H5N1 virus in a cow, pig or mink would further improve its adaptability to humans.

PART 4: RESPONSE TO POINTS IN THE AFFIDAVIT FROM DR. CATHY FURNESS

45. I have reviewed Dr. Furness's affidavit from January 30, 2025. In paragraph 12 of her affidavit, Dr. Furness notes that for avian influenza that "[a]*pproximate half of the over 900 human cases reported around the world since 1997 have been fatal*." No citation is provided for this statement, and this grossly overstates the lethality of avian H5N1 influenza in humans. As pointed out in paragraph 38, of 68 reported cases of avian H5N1 in humans, there was only 1 recorded fatality.[10, 11]

46. In paragraph 16 of her affidavit, Dr. Furness states that *"[a]lthough rare, transmission of HPAI to humans can occur, most commonly when people have had close contact with infected birds*." Actually, most reports of infection of people with avian H5N1 appear to be from cattle.[12]

47. In paragraph 19 of her affidavit, Dr. Furness mentions that "*CFIA's implementation of stamping out aligns with WOAH's standards. Without stamping out, a country cannot be considered free from HPAI until at least 12 months from an infection in poultry, as opposed 28 days where stamping out is implemented*." In my read through the World Organization for Animal Health (WOAH) guidelines provided in her Exhibit A, entitled "Chapter 10.4. Infection with High Pathogenicity Avian Influenza Viruses", I observed that the stamping out of infected animals was not a required policy to control outbreaks of HPAI as described in Article 10.4.3. As pointed out by Dr. Furness, a period of at least a year is stipulated if culling is not performed. Article 10.4.6 indicates that recovery of the "free status" is possible after 28 days following stamping out. However, in my review of the status of flocks in Canada where avian influenza has been detected, there are currently 38 infected premises that have active infections and another 485 that have

been infected and subjected to stamping out over about a three-year period.[14] Most of these outbreaks have been in B.C. and have affected about 14.5 million domestic birds across Canada. With such a large number of outbreaks, which are presumable spaced out over the intervening years, but primarily in the winter, it is hard to see how Canada has achieved a "free status" even with the stamping out policy enforced by the CFIA.

48. In paragraph 21 of her affidavit, Dr. Furness claims that "[s]*imilar to many birds, ostriches typically do not show clinical signs of infection of AI but can nonetheless continue to replicate, mutate, and shed the virus. It is also possible for ostriches to be infected with more than one subtype of influenza virus.*" This claim is not supported by any citation. As I have mentioned in paragraphs 11 to 20, it is highly unlikely that an asymptomatic ostrich or other bird is shedding functional replication-competent virus. As pointed out in paragraphs 30 and 43, while it is theoretically possible for the same cells in the same bird to be co-infected with two different influenza strains, a result in a more virulent and infectious virus that will infect humans and cause severe disease is very unlikely.

49. In paragraph 30 of her affidavit, Dr. Furness notes that "[i]*norder to qualify for an exemption, Universal needed to demonstrate that the ostriches: (a)were a distinct epidemiological unit; and (b) possessed rare and valuable poultry genetics*." From this statement, the fact that the ostriches may have been previously been infected, recovered and have fully immunity is deemed irrelevant. Moreover, CIFA apparently disregarded the unique composition of the UOF flock which included breeding with rare and endangered ostrich species, *i.e*., the Somalian Blue and Arabian ostriches. Culling of this flock will result in a loss of the further loss of this genetic pool, which will be difficult to replace.

[14] Status of ongoing avian influenza response by province. (2025) Government of Canada. Retrieved from https://inspection.canada.ca/en/animal-health/terrestrial-animals/diseases/reportable/avian-influenza/latest-bird-flu-situation/status-ongoing-response

PART 5: EVIDENCE OF NATURAL IMMUNITY TO AVIAN H5N1 INFLUENZA IN THE UOF HERD

50. In late December 2024 and early January 2025, some 69 of the approximately 450 ostriches on the UOF site succumbed to an infection, which on the balance of probabilities was influenza H5N1 based on two of the deceased animals testing PCR-positive for this virus. All of these deaths were confined to about 200 ostriches that were added to the herd at the UOF site after 2020. None of the ostriches that were at the UOF site prior to 2021 were seriously sick and died. This would be very consistent with herd immunity against H5N1 in the longer established members of the herd.

51. The UOF herd underwent a period of illness around February 2020, which resulted in the deaths of 10 of the approximately 250 ostriches that were on-site. This was diagnosed as a possible bacterial pseudomonas or *E. coli* infection at the time, but the symptoms associated with the illness were also consistent with influenza. H5N1 was already detected in wild birds in Europe in 2020, and the first H5N1 strain was first detected in geese in China in 1996.[15] Therefore, it is feasible that the ostrich herd could have been infected with H5N1 or a highly related influenza strain in 2020. In addition, secondary bacterial infections following initial influenza infection often are accompanied by a pseudomonas infection.[16]

52. Since there have been no deaths of ostriches on the UOF site since January 15, 2025 and all of the birds now appear to be healthy without symptoms, it is very likely that herd immunity to H5N1 has been achieved in the entire herd. The probability of this being true increases as time passes without any further evidence of sickness or positive testing for H5N1 by specific Polymerase Chain Reaction (PCR) tests and rapid antigen tests (RAT).

53. For reasons that are opaque to me, the CFIA has forbidden UOF to perform any testing or treatment of the ostriches at their site since imposition of the quarantine order. This would have

[15] Katella, K. (2024) H5N1 Bird Flu: What you need to know. Yale Medicine. Retrieved from https://www.yalemedicine.org/news/h5n1-bird-flu-what-to-know

[16] Morris, D.E., Cleary, D.W., Clarke, S.C. (2017) Secondary bacterial infections associated with influenza pandemics. Front Microbiol. 8:1041. doi: 10.3389/fmicb.2017.01041.

been an excellent opportunity to obtain valuable scientific information on the extent and durability of natural immunity following exposure to wild birds that carry the H5N1 virus.

54. Following recovery from a viral or bacterial infection, the only way to determine whether herd immunity has been achieved for the pathogen is to perform testing for the presence of specific antibodies or specific T-lymphocytes that recognize and bind to antigens from the pathogen. Such antigens can be proteins that are encoded by the genome of the pathogen or small portions of these proteins. Often this involves the testing of blood or saliva specimens from humans and animals. However, in birds, reptiles and amphibians, this can be achieved by testing egg yolks, which are rich in the IgY class of antibodies. IgY antibodies are particularly stable and can take temperatures up to 100°C and still retain their ability to lock on to target antigens.

55. In my January 30, 2025, expert report, I outlined how my company Kinexus Bioinformatics Corporation developed a serological test for determining in blood samples the levels of antibodies against the SARS-CoV-2 virus for a clinical study that involved the testing of 4,500 participants. In short, about 6,000 short peptide fragments derived from the predicted amino acid sequences of 28 SARS-CoV-2 proteins were tested in SPOT peptide arrays for their ability to bind antibodies that were present in individuals that got COVID-19 as confirmed by symptoms and positive PCR tests for the virus. These clinical studies revealed that about 90% of the tested participants had multiple antibodies that recognized SARS-CoV-2 virus-derived peptides, that their patterns of which viral peptides that the participants made antibodies varied markedly, and that these patterns were stable for at least two years.

56. With the situation of the apparent outbreak of avian influenza on the UOF site and the evident establishment of herd immunity by January 15, 2025, there was a valuable opportunity to see if the SPOT methodology could be applied to identifying those parts of the H5N1 virus that were immunogenic (*i.e.,* evoke a strong antibody response) and could be diagnostic for specific prior infection with the H5N1 virus and not any other strains of influenza viruses. However, the order from the CFIA prevented the UOF from sending me recent samples from the quarantined ostriches for antibody testing.

57. However, the UOF had frozen samples of egg yolks that had been collected from their ostriches in the summer of 2024, which pre-dated the recent infection of the herd in December 2024 and January 2025, and which were stored off-site, outside of the quarantine zone. I reasoned that if the ostriches had a prior exposure to H5N1 virus, then these yolk samples should have evidence of antibodies that recognize and bind to peptides patterned after parts of the H5 hemagglutinin and N1 neuraminidase proteins. Such peptides should be unique in their amino acid sequences from the hemagglutinin and neuraminidase proteins found in other influenza strains known to infect birds.

58. Figures 1 and 2 show the complete amino acid sequences of hemagglutinin and neuraminidase proteins found in H5N1 and other avian influenza viruses. Those regions that were the most unique to the H5 and N1 proteins are highlighted in yellow on the figure. Based on these unique sequences, 74 peptides were synthesized on cellulose membranes as individual spots on the arrays.

59. These H5N1-specific peptide SPOT arrays were then used for testing. Briefly, the frozen egg yolk were thawed and diluted with a phosphate-buffered saline solution and then incubated with the SPOT arrays for 2 hours. Subsequently, the arrays were washed repeatedly to remove any unbound antibodies from the cellulose membrane. The presence of captured antibodies on the arrays was detected with a horse radish peroxidase (HRP)-coupled secondary antibody that recognizes the constant region of chicken IgY antibodies. Enhanced chemiluminescence (ECL) detection based on the appearance of product from the HRP-couple reaction permits the production of a dark spot on the SPOT array after scanning it with a Bio-Rad FluroS-Max imager. The darker the peptide spot on the array image, the higher the level of IgY antibody that specifically recognizes that peptide amino acid sequence.

Figure 1. Alignment of the H5, H4, H7, H9 and H10 hemagglutinin proteins of chicken influenza strains. Amino acid sequences were obtain from Uniprot (www.uniprot.org) and aligned using the CLUSTAL O(1.2.4) multiple sequence alignment program available at the Uniprot website. Perfect matches (*i.e.,* identity) with the amino acid type and position are shown with an asterisk; similar amino acid types in the same position (*i.e.,* similarity) are shown with a colon (high similarity) or semi-colon (low similarity). The regions encompassing the peptides used in the Kinexus anti-H5N1 antibody test for the hemagglutinin are highlighted in yellow.

```
sp|P09345|HEMA_I59A0    H5  ME--RIVLLLA----IVSLVKSDQICIGYHANKSTKQVDTIMEKNVTVTHAQDILERTHN  54
tr|Q4ZJF4|Q4ZJF4_9INFA  H9  MEAVSLITILL----VVTVSNADKICIGYQSTNSTETVDTLTENNVPVTHAKELLHTEHN  56
sp|P19695|HEMA_I75A4    H4  MLSITILFLLIAEGSSQNYTGNPVICLGHHAVSNGTMVKTLTDDQVEVVTAQELVESQHL  60
sp|P12581|HEMA_I49A0    H10 MYKVVVIIALL-----GAVRGLDKICLGHHAVANGTIVKTLTNVQEEVTNATETVESTSL  55
sp|P09343|HEMA_I85A3    H7  MNTQILILTLV----AAIHTNADKICLGHHAVSNGTKVNTLTERGVEVVNATETVERRTI  56
                                *    ::  *             **:*:::  .   *.*: :    *. * : :.

sp|P09345|HEMA_I59A0    H5  GKLCSLNGVKPLILRDCSVAGWLLGNPMCDEFLNVPEWSYIVEKDNPINSLCYPGDFNDY  114
tr|Q4ZJF4|Q4ZJF4_9INFA  H9  GMLCATNLGHPLILDTCTIEGLIYGNPSCNLLLGGREWSYIVERPSAVNGLCYPGNVENL  116
sp|P19695|HEMA_I75A4    H4  PELCPS-PLRLVDGQTCDIVNGALGSPGCNHLNG-AEWDVFIERPTAV-DTCYPFDVPDY  117
sp|P12581|HEMA_I49A0    H10 NRLCMK-GRSYKDLGNCHPIGMLIGTPACDLHLT-GTWDTLIERKNAI-AYCYPGTTINE  112
sp|P09343|HEMA_I85A3    H7  PRICTK-GKKAIDLGQCGLLGIITGPPQCDQFLE-FTADLIIERREGN-DVCYPGKFVNE  113
                              :*          *   .   * * *:        . ::*:       ***    :

sp|P09345|HEMA_I59A0    H5  EELKHLLSSTNHFEKIQIIPRSSWSNHDASSGVSSACPYIGRSSFFRNVVWLIKK--DNA  172
tr|Q4ZJF4|Q4ZJF4_9INFA  H9  EELRSLFSSASSYQSIQIFPDTIWNVSY--SGTSKAC----SDSFYGSMRWLAQK--NNA  168
sp|P19695|HEMA_I75A4    H4  QSLRSILANNGKFEFI--VEKFQWNT-VKQNGKSGACKRANENDFFTNLNWLTKS-DGNA  173
sp|P12581|HEMA_I49A0    H10 GALRQKIMESGGISKT--STGFAYGSSINSAGTTKACMRNGGDSFYAEVKWLVSKDKGQN  170
sp|P09343|HEMA_I85A3    H7  EALRQILRESGGINKE--TTGFTYSG-IRTNGVTSACRR-LGSSFYAEMKWLLSNTDNAA  169
                              *:  : . .  .         :.      * : **     ..*: .: ** ..  .

sp|P09345|HEMA_I59A0    H5  YPTIKRSYNNTNQEDLLILWGIHHPNDAAEQTKLYQNPTTYVSVGTSTLNQRSIPEIATR  232
tr|Q4ZJF4|Q4ZJF4_9INFA  H9  YPIQDAQYTNNRGKNIPFMWGINHPPTDTVQTNLYTRTDTTTSVATEDINRTFKPLIGPR  228
sp|P19695|HEMA_I75A4    H4  YPLQNLTKVNNGDYARLYIWGVHHPSTDTEQTNLYENNPGRVTVSTKTSQTSVVPNIGSR  233
sp|P12581|HEMA_I49A0    H10 FPQTTNTYRNTDTAEHLIIWGIHHPSSTQEKNDLYGTQSLSISVGSSTYQNNFVPVVRAR  230
sp|P09343|HEMA_I85A3    H7  FPQMTKSYKNTRNEPALIVWGIHHSGSATEQTKLYGSGNKLITVGSSNYQQSFVPSPGAR  229
                            :*       *.       :**::*      :..**       :*.:.  :    *    *

sp|P09345|HEMA_I59A0    H5  PKVNGQSGRMEFFWTILKPNDAINFESNGNFIAPEYAYKIVKKGDSAIMKSGLAYGNCDT  292
tr|Q4ZJF4|Q4ZJF4_9INFA  H9  PLVNGQQGRIDYYWSVLKPGQTLRVRSNGNLTAPWYGHILSGESHGRILKTDLNSGNCVV  288
sp|P19695|HEMA_I75A4    H4  PWVRGQSGRISFYWTIVEPGDIIVFNTIGNLIAPRGHYKLNSQKKSTILNTAVPIGSCVS  293
sp|P12581|HEMA_I49A0    H10 PQVNGQSGRIDFHWTLVQPGDNITFSHNGGRIAPSRVSKLVGRGL-GIQSEASIDNGCES  289
sp|P09343|HEMA_I85A3    H7  PQVNGQSGRIDFHWLILNPNDTVTFSFNGAFVAPDRVSFFKGKSM-GIQSEVPVDTNCEG  288
                            * *.**.**:.:.* :::*.: : .   *   **     :  .    * .      .*

sp|P09345|HEMA_I59A0    H5  KCQTPVGAINSSMPFHNIHPHTIGECPKYVKSDRLVLATGLRNVPQR----KKRGLFGAI  348
tr|Q4ZJF4|Q4ZJF4_9INFA  H9  QCQTERGGLNTTLPFHNVSKYAFGNCPKYVGVKSLKLAVGLRNVPAR----SSRGLFGAI  344
sp|P19695|HEMA_I75A4    H4  KCHTDRGSITTTKPFQNISRISIGDCPKYVKQGSLKLATGMRNIPEK----ATRGLFGAI  349
sp|P12581|HEMA_I49A0    H10 KCFWRGGSINTKLPFQNLSPRTVGQCPKYVNKKSLMLATGMRNVPEIM---QGRGLFGAI  346
sp|P09343|HEMA_I85A3    H7  ECYHNGGTITSNLPFQNVNSRAVGKCPRYVKQKSLLLATGMKNVPEIPKKREKRGLFGAI  348
                            :*    * :.:. **:*:   :.*.**:**    * **.*::*:*        *******

sp|P09345|HEMA_I59A0    H5  AGFIEGGWQGMVDGWYGYHHSNEQGSGYAADKESTQKAIDGITNKVNSIIDKMNTQFKAV  408
tr|Q4ZJF4|Q4ZJF4_9INFA  H9  AGFIEGGWSGLVAGWYGFQHSNDQGVGMAADRDSTQKAIDKITSKVNNIVDKMNKQYEII  404
sp|P19695|HEMA_I75A4    H4  AGFIENGWQGLIDGWYGFRHQNAEGTGTAADLKSTQAAIDQINGKLNRLIEKTNEKYHQI  409
sp|P12581|HEMA_I49A0    H10 AGFIENGWEGMVDGWYGFRHQNAQGTGQAADYKSTQAAIDQITGKLNRLIEKTNTEFESI  406
sp|P09343|HEMA_I85A3    H7  AGFIENGWEGLVDGWYGFRHQNAQGEGTAADYKSTQSAIDQITGKLNRLIEKTNQQFELI  408
                            *****.**.*:: ****::*.* :* * *** .*** *** *..*:* :::* * ::. :

sp|P09345|HEMA_I59A0    H5  GKEFNNLERRVENLNKKMEDGFLDVWTYNVELLVLMENERTLDFHDSNVKNLYDKVRLQL  468
tr|Q4ZJF4|Q4ZJF4_9INFA  H9  DHEFSEVETRLNMINDKIDDQIQDIWAYNAELLVLLENQKPLDEHDANVNNLYNKVKRTL  464
sp|P19695|HEMA_I75A4    H4  EKEFEQVEGRIQDLEKYVEDTKIDLWSYNAELLVALENQHTIDVTDSEMDKLFERVRRQL  469
sp|P12581|HEMA_I49A0    H10 ESEFSEIEHQIGNVINWTKDSITDIWTYQAELLVAMENQHTIDMADSEMLNLYERVRKQL  466
sp|P09343|HEMA_I85A3    H7  DNEFTEVEKQIGNVINWTRDSITEVWSYNADLLVAMENQHTIDLADSEMNKLYERVRRQL  468
                              ** ::* ::  : .   *   ::*:*:.:*** :**:: :*  *::: :*:::*:  *

sp|P09345|HEMA_I59A0    H5  KDNARELGNGCFEFYHKCDNECMESVRNGTYDYPQYSEEARLNREEISGVKLESMGVYQI  528
tr|Q4ZJF4|Q4ZJF4_9INFA  H9  GSNAVEDGKGCFELYHKCDDQCMETIRNGTYNRRKYKEESRLERQKIEGVKLESEGTYKI  524
sp|P19695|HEMA_I75A4    H4  RENAEDKGNGCFEIFHQCDNNCIESIRNGTYDHDIYRDEAINNRFQIQGVKLTQ-GYKDI  528
sp|P12581|HEMA_I49A0    H10 RQNAEEDGKGCFEIYHTCDDSCMESIRNNTYDHSQYREEALLNRLNINSVKLSS-GYKDI  525
sp|P09343|HEMA_I85A3    H7  RENAEEDCTGCFEIFHKCDDDCMASIRNNTYDHSTYREEAMQNRVKIDPVKLSS-GYKDV  527
                              .** :  .****::* **:.*: ::**.**:   * :*:  :* :*. *** . *  .:
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sp|P09345|HEMA_I59A0     H5  LSIYSTVASSLALAIMIAGLSFWMCSNGSLQCRICI   564
tr|Q4ZJF4|Q4ZJF4_9INFA   H9  LTIYSTVASSLVIAMGFAAFLFWAMSNGSCRCNICI   560
sp|P19695|HEMA_I75A4     H4  ILWISFSISCFLLVALLLAFILWACQNGNIRCQICI   564
sp|P12581|HEMA_I49A0     H10 ILWFSFGASCFVLLAAVMGLVFFCLKNGNMQCTICI   561
sp|P09343|HEMA_I85A3     H7  ILWFSLGASCFLLLAIAMGLVFMCVKNGNMRCTICI   563
                             :   *   *.: :     .: :   .**. :* ***
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Figure 2. Alignment of the N1, N2, N3, N6, N7, N8 and N9 neuraminidase proteins of chicken influenza strains. Amino acid sequences were obtain from Uniprot (www.uniprot.org) and aligned using the CLUSTAL O(1.2.4) multiple sequence alignment program available at the Uniprot website. Perfect matches (*i.e.,* identity) with the amino acid type and position are shown with an asterisk; similar amino acid types in the same position (*i.e.,* similarity) are shown with a colon (high similarity) or semi-colon (low similarity). The regions encompassing the peptides used in the Kinexus anti-H5N1 antibody test for the neuraminidase are highlighted in yellow.

```
sp|Q809V2|NRAM_I01A2           N1  MNPNQKIITIGSICMVIGIVSLMLQIGNIISIWVSHSIQTGNQHQA---------EPCNQ   51
tr|D1LM97|D1LM97_9INFA         N8  MNPNLKIITIGSVSLGLVVLNILLHIVSIT---ITVLVLPGD-GNN---------GSCNE   47
sp|P18881|NRAM_I000F           N7  MNPNQKLFALSGVAIALSVLNLLIGISNVGLNVSLHLKGEGVKQENNLTCTTITQ--NNT   58
tr|A0A0C4K198|A0A0C4K198_9INFA N9  MNPNQKILCTSATAIIIGAIAVLIGIANLGLNIGLHLKPGCNCSHSQPET---TN--TSQ   55
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA N6  MNPNQKITCISATGMTLSVVSLLIGIANLGLNIGLHYKVSDSTTINIPNM---NE--T--   53
tr|A6M7W4|A6M7W4_9INFA         N3  MNPNQKIITLGVVNTTLSTIALIIGVGNLIFNTVIHEKIGDHQTVVYPTVTPPGTPNCSD   60
sp|P09573|NRAM_I83A6           N2  MNPNQKIITIGSVSLTIATVCFLMQIAILATNVTLHFRQNERSIPAYNQTTP-----CKP   55
                                   **** *:   .     :  : .:: :  :

sp|Q809V2|NRAM_I01A2           N1  SIITYENNTWVNQTYVNISNTNL---LTEKAVASVTLAGNSSLCPISGWAVYSKDNGIRI  108
tr|D1LM97|D1LM97_9INFA         N8  TVIREYNETVRIEKITQWHNTNIIE-YIEKPESDLFMNNTEPLCDAKGFAPFSKDNGIRI  106
sp|P18881|NRAM_I000F           N7  TVVENTY----------VNNTTIINKG-TNLKAPNYLLLNKSLCSVEGWVVIAKDNAIRF  107
tr|A0A0C4K198|A0A0C4K198_9INFA N9  TII-NNY----------YNETNITNIQMEERTSRNFNNLTKGLCTINSWHIYGKDNAVRI  104
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA N6  ------N----------PTTTNITNIIVNKNEERTFLNLTKPLCEVNSWHILSKDNAIRI  97
tr|A6M7W4|A6M7W4_9INFA         N3  TIITYNN----------TVVNNITTTII--AEAEKHFKPSLPLCPFRGFFPFHKDNAIRL  108
sp|P09573|NRAM_I83A6           N2  I------------------------II--ERNIKYRNWSKPQCQITGFAPFSKDNSIRL  88
                                                                .   *   .:    ***.:*:

sp|Q809V2|NRAM_I01A2           N1  GSKGDVFVIREPFISCSHLECRTFFLTQGALLNDKHSNGTVKDRSPYRTLMSCPVGEAPS  168
tr|D1LM97|D1LM97_9INFA         N8  GSRGHVFVIREPFVSCSPTECRTFFLTQGSLLNDKHSNGTVKDRSPYRTLMSVGIGQSPN  166
sp|P18881|NRAM_I000F           N7  GESEQIIVTREPYVSCDPSGCKMYALHQGTTIRNKHSNGTIHDRTTFRGLISTPLGTPPT  167
tr|A0A0C4K198|A0A0C4K198_9INFA N9  GESSDVLVTREPYVSCDPDECRFYALSQGTTIRGKHSNGTIHDRSQYRALISWPLSSPPT  164
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA N6  GEDAHILVTREPYLSCDPQGCRMFALSQGTTLRGRHANGTIHDRSPFRALISWEMGQAPS  157
tr|A6M7W4|A6M7W4_9INFA         N3  GENKDVIVTREPYVSCDNDGCWSFALAQGALLGTKHSNGTIKDRTPYRSLIRFPIGTAPV  168
sp|P09573|NRAM_I83A6           N2  SAGGGIWVTREPYVSCDPSKCYQFALGQGTTLDNNHSNGTIHDRTPHRTLLMNELGVPFH  148
                                   .    : * ***::**.   *  : * **: :  .*:***::**: .* *:   :.

sp|Q809V2|NRAM_I01A2           N1  PYNSRFESVAWSASACHDGTSWLTIGISGPDNGAVAVLKYNGIITDTIKSWRNNILRTQE  228
tr|D1LM97|D1LM97_9INFA         N8  VYQARFEAVAWSATACHDGKKWMTIGVTGPDAKAVAVVHYGGIPTDVINSWAGDILRTQE  226
sp|P18881|NRAM_I000F           N7  VSNSDFICVGWSSTSCHDGVGRMTICIQGNNDNATATVYYNRRLTTTIKTWAKNILRTQE  227
tr|A0A0C4K198|A0A0C4K198_9INFA N9  VYNSRVECIGWSSTSCHDGKSRMSICISGPNNNASAVVWYNRRPVAEINTWAQNILRTQE  224
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA N6  PYNTRVECIGWSSTSCHDGISRMSICISGPNNNASAVVWYRGRPVTEIPSWVGNILRTQE  217
tr|A6M7W4|A6M7W4_9INFA         N3  LGNYKEICVAWSSSSCFDGKEWMHVCMTGNDNDASAQIIYAGKMTDSIKSWRRDILRTQE  228
sp|P09573|NRAM_I83A6           N2  LG-TRQVCIAWSSSSCHDGKAWLHVCVTGDDRNATASFIYNGMLVDSIGSWSQNILRTQE  207
                                         .:.**:::*.**   : : : * :  * * . *    .  * :*  :******
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sp|Q809V2|NRAM_I01A2          N1  SECACVNGSCFTVMTDGPSNGQASYKIFKIEKGKVVKSVELN-APNYHYEECSCYPDAGE  287
tr|D1LM97|D1LM97_9INFA        N8  SSCTCIQGECYWVMTDGPANRQAQYRAFKAKQGKIIGQTEIS-FNGGHIEECSCYPNEGK  285
sp|P18881|NRAM_I000F          N7  SECVCYNGTCAVVMTDGPASSQAYTKIMYFHKGLIIKEEPLR-GSARHIEECSCYGHDQK  286
tr|A0A0C4K198|A0A0C4K198_9INFA N9  SECVCHNGVCPVVFTDGSATGPADTRIYYFKEGKILKWESLT-GTAKHIEECSCYGERTG  283
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA N6  SECVCHKGICPVVMTDGPANNKAATKIIYFKEGKIQKIEELQ-GNAQHIEECSCYGAAGM  276
tr|A6M7W4|A6M7W4_9INFA        N3  SECQCIDGTCVVAVTDGPAANSADHRVYWIREGRVIKYENVPKTKIQHLEECSCYVDI-D  287
sp|P09573|NRAM_I83A6          N2  SECVCINGTCTVVMTDGSASGKADIRILFIREGKIVHISPLS-GSAQHIEECSCYPRYPN  266
                                  *.* * .* *  ..*** :   *  :    .:* :     :      * ******

sp|Q809V2|NRAM_I01A2          N1  ITCVCRDNWHGSNRPWVSFNQN-LEYQIGYICSGVFGDNPRPNDG--TGSCGPVSPN--G  342
tr|D1LM97|D1LM97_9INFA        N8  VECVCRDNWTGTNRPVLVISSD-LSYRVGYLCAGLPSDTPRGEDNQFTGSCTSPMGN--Q  342
sp|P18881|NRAM_I000F          N7  VSCVCRDNWQGANRPIIEIDMSTLEHTSRCVCTGVLTDTSRPGDKP-NGDCSNPITGSPG  345
tr|A0A0C4K198|A0A0C4K198_9INFA N9  ITCTCRDNWQGSNRPVIQIDPVAMTHTSQYICSPVLTDNPRPNDPN-IGKCNDPYPGN-N  341
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA N6  IKCVCRDNWKGANRPIITIDPEMMTHTSKYLCSKILTDTSRPNDPT-NGNCDAPITGGSP  335
tr|A6M7W4|A6M7W4_9INFA        N3  VYCVCRDNWKGSNRPWMRINNE-TILETGYVCSKFHSDTPRPADPS-TVSCDSPSNVN-G  344
sp|P09573|NRAM_I83A6          N2  VRCVCRDNWKGSNRPVIDINMADYSIDSSYVCSGLVGDTPRNDDSSSSSNCRDPNNER-G  325
                                  : *.***** *:*** : :.          :*: .  *. *  *     .*

sp|Q809V2|NRAM_I01A2          N1  AYGIKGFSFKYGNGVWIGRTKSTNSRSGFEMIWDPNGWTG-TDSNFSVKQDIVAITDWSG  401
tr|D1LM97|D1LM97_9INFA        N8  GYGVKGFGFRQGNDVWMGRTISRTSRSGFEILRVRDGWIQ-NSKEQIKRQVVVDNLNWSG  401
sp|P18881|NRAM_I000F          N7  APGVKGFGFLNGDNTWLGRTISPRSRSGFEMLKIPNAETD-PNSRIIERQEIVDNSNWSG  404
tr|A0A0C4K198|A0A0C4K198_9INFA N9  NNGVKGFSYLDGANTWLGRTISTASRSGYEMLKVPNALTD-DRSKPIQGQTIVLNADWSG  400
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA N6  DPGVKGFAFLDGENSWLGRTISKDSRSGYEMLKVPNAETD-TQSGPTSYQLIVNNQNWSG  394
tr|A6M7W4|A6M7W4_9INFA        N3  GPGVKGFGFKTGDDVWLGRTVSISGRSGFEIIRVAEGWINSPNHAKSVTQTLVSNNDWSG  404
sp|P09573|NRAM_I83A6              NPGVKGWAFDIGDDVWMGRTISKDSRSGYETFRVIGGWATANSKSQTNRQVIVDNNNWSG  385
                                    *:**:.:  * . *:*** *  .***:* :    .            * :*   :***

sp|Q809V2|NRAM_I01A2          N1  YSGSFVQHPELTGVDCIRPCFWVELIRGRPKES--TIWTSGSSISFCGVNSDTVGWSWPD  459
tr|D1LM97|D1LM97_9INFA        N8  YSGSFTLPVELTRRNCLVPCFWVEMIRGKPEEK--TMWTSSSSIVMCGVDHEIADWSWHD  459
sp|P18881|NRAM_I000F          N7  YSGSFIDCWD-EANECYNPCFYVELIRGRPEEAKYVWWTSNSLIALCGSPVSVGSGSFPD  463
tr|A0A0C4K198|A0A0C4K198_9INFA N9  YSGSFMDYWA-E-GDCYRACFYVELIRGRPKEDK-VWWTSNSIVSMCSSTEFLGQWNWPD  457
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA N6  YSGAFIDYWA-N-KECFNPCFYVELIRGRPKEID-VLWASNSMVALCGSRERLGSWSWHD  451
tr|A6M7W4|A6M7W4_9INFA        N3  YSGSFIV----ENNGCFQPCFYVELIRGRPNKNDDVSWTSNSIVTFCGLDNEPGSGNWPD  460
sp|P09573|NRAM_I83A6          N2  YSGIFSV----ESKSCINRCFYVELIRGRPQE-TRVWWTSNSIVVFCGTSGTYGTGSWPD  440
                                  *** *          *   **:**:***:*::   . *:*.* : :*.       .: *

sp|Q809V2|NRAM_I01A2          N1  GAELPFTIDK-     469
tr|D1LM97|D1LM97_9INFA        N8  GAILPFDIDKM     470
sp|P18881|NRAM_I000F          N7  GAQIQYFS---     471
tr|A0A0C4K198|A0A0C4K198_9INFA N9  GAKIEYFL---     465
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA N6  GAEIIYFK---     459
tr|A6M7W4|A6M7W4_9INFA        N3  GSNIGFMPK--     469
sp|P09573|NRAM_I83A6          N2  GANINFMPL--     449
                                  *: : :
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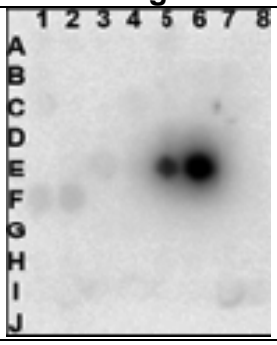
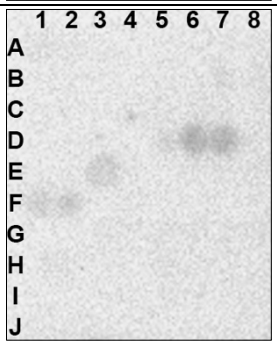
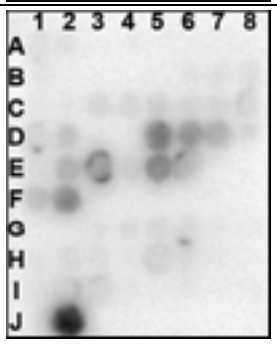
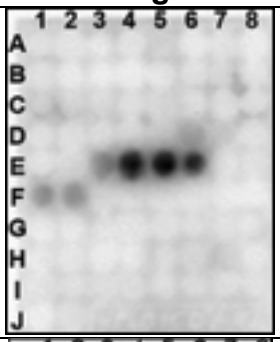
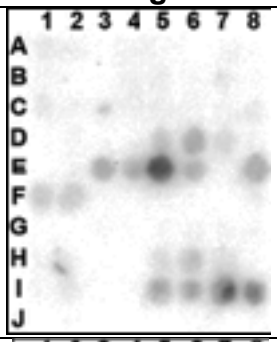
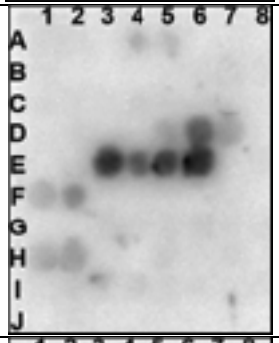
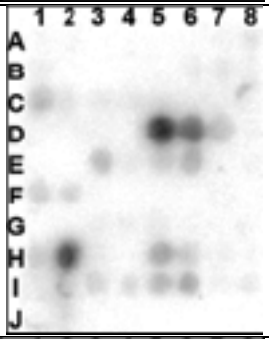
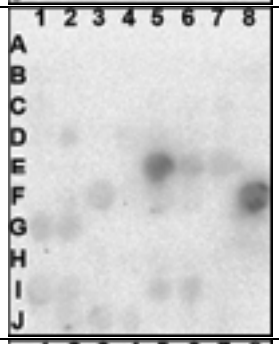
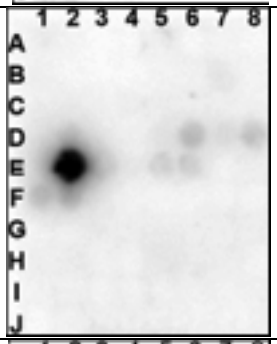
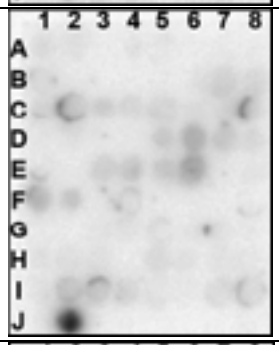
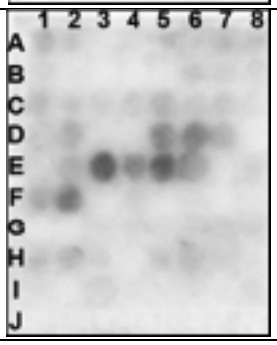
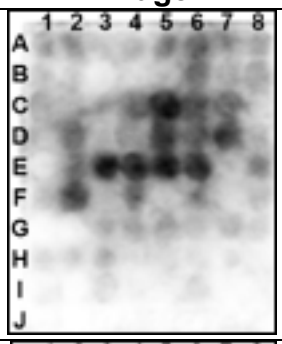
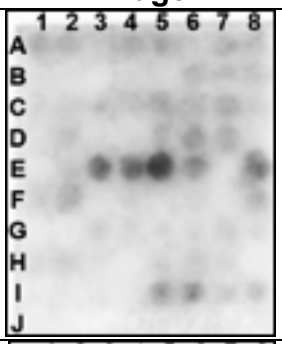
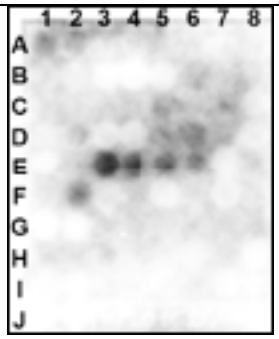
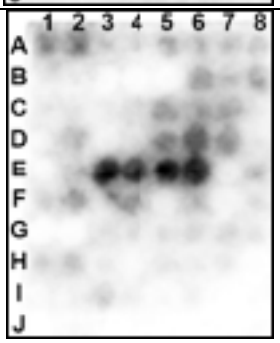
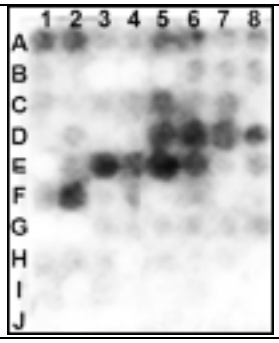
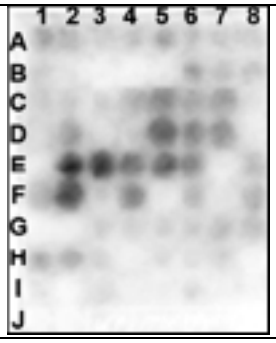
60. Figure 3 shows the raw testing results with the H5N1-specific SPOT array developed by Kinexus using egg yolk samples from 18 different UOF ostriches that were sampled in the summer of 2024. These findings conclusively show that these ostriches possessed antibodies that could bind to multiple parts of the H5 and N1 proteins of the H5N1 avian influenza virus, which is strongly indicative of prior exposure to the virus, and can account why most of the birds did not succumb to the subsequent infection with H5N1 in December 2024 up to January 15, 2025, and none afterwards. As noted for the SARS-CoV-2 antibody response in humans, the patterns of antibody response to H5N1 appears to be unique in each ostrich.

Figure 3. H5N1 peptide SPOT arrays probed for IgY antibodies with ostrich egg yolk samples originally obtained in June, July and August of 2024. Testing was performed between January 31 and February 7, 2025. The appearance of a dark spot indicates positive immunoreactivity with a 14 amino acid long peptide derived from the H5 hemagglutinin protein (Spots A1 to E7) and N1 neuraminidase protein (Spots E8 to J2). In some cases, the peptides in adjacent spots shared 11 of the 14 amino acids. For example, Spot E3 (FEAVGREFNNLERR), Spot E4 (VGREFNNLERRIEN), Spot E5 (EFNNLERRIENLNK) and Spot (NLERRIENLNKKME), which were commonly immunogenic, encompassed a 23 amino acid stretch in the H5 hemaglutinin protein. The peptide in Spot I6 (TDSSFSVKQDIVAI) was the most commonly immunoreactive sequence from the N1 neuraminidase protein. The anti-chicken IgY secondary antibody weakly reacted directly with the peptides in Spots D6, D7, E3, F1 and F2, but none of the other peptides on the array.

Information	Image	Information	Image
KPL01CDY-01a T-TBS (neg. control) T-TBS (neg. control) – Background Control for anti-IgY antibody binding		KPL01CDY-05a H July 11, 2024 P5 H	
KPL01CDY-03b T-TBS (neg. control) T-TBS (neg. control) Background Control for anti-IgY antibody binding		KPL01CDY-06a P5 T2 D1 July 21, 2024 P5 T2 D1	

Information	Image	Information	Image
KPL01CDY-02a A July 5, 2024 P5 A		KPL01CDY-07a T July 14, 2024 P5 T	
KPL01CDY-03a A1 July 19, 2024 A1		KPL01CDY-08a T2 Aug 19, 2024 P4 T2	
KPL01CDY-04a B July 6, 2024 P5 B		KPL01CDY-09a P5 PRE ANTIBODY June 20, 2024 P5	
KPL01CDY-11a W2 Aug 5, 2024 P5 W2		KPL01CDY-05b L July 15 2024 P4 L	
KPL01CDY-12a R July 14, 2024 P5 R		KPL01CDY-06b N July 14, 2024 P4 N	

Information	Image	Information	Image
KPL01CDY-01b D July 9, 2024 P4 D		KPL01CDY-07b O July 13, 2024 P5 O	
KPL01CDY-02b P4 E July 9, 2024 P4 E		KPL01CDY-11b X July 17, 2024 P4 X	
KPL01CDY-04b J July 11, 2024 P4 J		KPL01CDY-12b Y July 18. 2024 P4 Y	

61. It should be appreciated that the Kinexus H5N1 antibody test was specifically designed to distinguish previous H5N1 infections from other avian influenza virus infections. Many more peptide sequences of H5 and N1 could have been tested that would likely have cross-reacted with the hemagglutinin and neuraminidase proteins of these other influenza strains. This would have further demonstrated a high degree of immune protection against future influenza infections, which would include other mutated forms of H5N1.

62. Without further exposure to a pathogen, the levels of antibodies against the pathogen will decline over time, but the B-cell that produce these antibodies still remain as plasma or memory B-cells. These B-cells will rapidly multiple and generate more antibodies as needed. Re-exposure to the H5N1 virus at the end of last year and the beginning of 2025 likely boosted the levels of

the anti-H5 and anti-N1 IgY levels to much higher than what was evident in our tests of the egg yolks from last summer.

63. Any future encounters of the ostrich herd at the UOF site with wild birds infected with the H5N1 virus at this point is likely to permit natural boosting the anti-H5N1 antibody levels in the ostriches without causing them to be sick. Any requirements to prevent wild birds from frequenting the UOF site, for example by netting ponds, or restricting access to the bird feed, would appear to me to be unnecessary. Rather, it would be better for the wild birds to come to the UOF site than another site where the herd immunity against the H5N1 virus has not been established. Infected wild birds are highly unlikely to successfully transmit the H5N1 virus to the ostriches, and vice versa.

64. Since the remaining UOF ostriches have successfully developed resistance to the H5N1 virus, they could be valuable breeding stock for the propagation of future ostriches that genetically are less prone to become infected and sick. While previous history of survival from an infection and development adaptive immunity is a major factor in herd immunity, careful breeding can also contribute to improved immunity to a pathogen.

65. Another important consideration in preserving the UOF ostriches is that they are already an excellent source of industrial scale production of anti-H5 and anti-N1 antibodies in their eggs. One ostrich hen can produce up to 100 eggs in a season. Using the knowledge from the Kinexus H5N1 SPOT array study, these antibodies can be affinity-purified and used to develop rapid antigen tests for diagnosis of H5N1 outbreaks in chicken, cattle, pigs and minks. These ostrich antibodies can also be purified for therapeutic purposes to isolate neutralizing antibodies that specific block the binding of the virus to host cell receptors.

66. The CFIA should be seizing the opportunity to use the UOF site to obtain important information about the establishment, effectiveness and durability of protective herd immunity. The longevity and careful tracking of these valuable ostriches on an isolated farm as birds that have no flight risk make this an ideal location for further research.

67. It is evident from the continuous outbreaks of H5N1 on commercial chicken farms in Canada, and recently in cattle in the US, that the policy of testing, culling and compensation is not working with at least 523 outbreaks in Canada and no sign of this abating as long as migrating wild birds carry the H5N1 virus.[14] It may be many years before herd immunity against H5N1 is established in the wild bird populations.

Respectfully submitted by,

Steven Pelech, Ph.D.

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Department of Medicine,
University of British Columbia

President and Chief Scientific Officer,
Kinexus Bioinformatics Corporation

Vice-President, and Co-Chair,
Scientific and Medical Advisory Committee,
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Date: 1 April 2025

Re: Expert Report – The Process Involved and Merits of Testing newly laid eggs from the ostriches to determine infection, transmissibility and immunity and merits of culling order

For the case involving Universal Ostrich Farms Inc. represented by Mr. Michael Carter of Cleveland & Doan Barristers & Solicitors, and Mr. Lee Turner of Doak Shirreff Lawyers LLP.

1. My full name is Steven Daniel Pelech, and I reside at 5640 Musgrave Crescent, in Richmond, British Columbia, Canada. My Ph.D. and post-doctoral training is in the area of biochemistry, and I have been on the faculty of the University of British Columbia as a professor in the Department of Medicine for over 36 years.

2. In particular, in the letter that was transmitted by e-mail to me by Mr. Turner on March 28, 2025 (Exhibit A), I was requested to provide the following information:

   i. My name, address, area of expertise and a copy of my *curriculum vitae* (provided as Exhibit A);
   ii. My qualifications and employment and educational experience in my area of expertise that pertain to the issues I have been asked to opine on;

iii. The instructions that was provided to me in relation to the proceedings of the Universal Ostrich Farms Inc. (UOF) verses The Canada Food Inspection Agency (CFIA) (as described Mr. Turner's March 28, 2025 letter, which is provided as Exhibit A);

iv. The nature of the opinion being sought and the issues in the proceeding to which the opinion relates;

v. My opinion respecting those issues; and

vi. My reasons for my opinion, including

(a) a description of the factual assumptions on which my opinion is based,

(b) a description of any research relied upon that led me to form my opinion, and

(c) a list of every document relied upon by me in forming my opinion.

4. In addition, I have been asked to certify that:

i. I am aware of my duty to assist the Federal Court of Canada;

ii. I am not an advocate for any party in these proceedings;

iii. I have prepared my report in conformity with my duty; and

iv. I will, if called upon to give oral or written testimony, give that testimony in conformity with my duty.

5. I do certify that I will fulfill my responsibilities to the Federal Court of Canada in full compliance to these obligations and requirements. Note that I have already certified this as documented in Exhibit B of my January 29, 2025 expert report, which has already been filed with the Court.

PART 1: SCOPE OF THE EXPERT REPORT AND QUALIFICATIONS

6. The specific questions that I was asked to address are the following:

i. Is there a test that could be performed either on the ostriches themselves or their eggs that can be performed safely by the farmers themselves on the farm, that would pose no risk of infection or transmission to other wildlife or humans, such that these test samples could then be provided to me so that I could analyze in my laboratory to determine whether or not these birds have been exposed H5N1, have developed antibodies to H5N1, whether they are

immune to H5N1, and whether they pose any risk of spreading infection of H5N1 to other wildlife or humans?

ii. If the answer to this question is yes, can I describe test that could be done, how that sample can be safely transported to me, and what that test would tell the Court?

iii. Explain why the test is safe for the farmers to perform, why it is safe to transport to me, so that the reader of my report understands clearly why the test and transporting its samples to me for testing would present no risk to the public or other wildlife.

iv. If the test results demonstrate that the surviving ostriches have full antibodies to the strain of H5N1 that was detected by CFIA through their own testing either at the Abbotsford Lab or the Winnipeg lab or otherwise, please explain what the significance of that is with respect to the risk of transmission of the virus to other wildlife or humans and what the merits of culling the ostriches would be as a result.

7. To address above questions posed by Mr. Turner of the firm of Doak Shirreff, this required a broad and comprehensive assessment of the accessible scientific literature with respect to available knowledge about the testing of immunity, and the effectiveness of natural and vaccine-induced immunity in preventing or reducing illness and spread of respiratory RNA viruses. Previously, I was asked by Mr. Carter of the firm of Cleveland & Doan to provide my expert opinion related to the flock of ostriches located at the UOF and the risks of transmission of the H5N1 strain of influenza, which is responsible for the current waves of highly pathogenic avian influenza (HPAI). In addition, I was also requested to comment upon the value and applications of these birds with respect to the advancement of biomedical knowledge and production of diagnostics, vaccines and therapeutics. I have previously commented upon these topics in two reports, dated January 29, 2025, and February 12, 2025, which have already been filed with the Court as expert witness documents.

8. With my training and experience, I am confident that I am fully able to provide a qualified expert opinion in the previous reports and for this report. In my January 29, 2025, expert report, a full copy of my *curriculum vitae*, dated January 25, 2025*,* was already provided to the Court as Exhibit C. Furthermore, in “Part 5: Qualifications and Acknowledgements as an Expert on Immunology”

(para. 74 to 85) of the same report, I have already summarized my relevant training and experience.

9. The simplest definitions of "Immunology" encompass the study of immune systems in all organisms that provide protection against infectious diseases and cancer, whilst avoiding autoimmune responses in the body and other common and benign factors in the environment. Viruses are major causes of infectious diseases, and I have been actively involved in experimental research related to the immune response to RNA virus infections, including caused by the SARS-CoV-2 virus, and more recently influenza. My research, as does most immunology-based research, involves using experimental animal models of human disease, because what is applicable to animals is usually translatable into improved understanding of human diseases. My own research has previously encompassed the use of a wide range of species ranging from starfish, sea urchins, frogs, chickens, mice, and rats as well as human cells as the main experimental model systems in which I have published. Epidemiology involves not only the study of rates of transmission of infectious diseases, but also understanding the underlying molecular mechanisms of transmission as well as techniques for specifically tracking the spread of the pathogen to permit preventative and mitigating measures. While I have received formal training in immunology and virology in my undergraduate and graduate courses, for over 40 years since then, I have continued to update and expand my knowledge in these areas from hands-on experimentation, teaching graduate and medical students on these subjects, reading thousands of scientific articles on these subjects, and attending weekly grand-rounds and seminars that often included these topics. Finally, the fact that the H5N1 influenza virus is capable, to varying degrees, of infecting such a wide range of bird and mammal species in addition to humans clearly demonstrate that the virus is exploiting the same molecular mechanisms to infect and replicate in an extensive host range, and has targeted common host proteins to achieve this. The influenza genome only features 10 genes that contained in 8 chromosomal segments, which encode 10 viral proteins that are essential for successful entry, reproduction, and exit of the virus particles. These 10 viral proteins are optimized to the host to hijack its reproductive proteins and to try to evade the host's immune system. Thus, while a trained medical doctor or veterinarian can

provide established treatments to fight an infectious disease, it is those with research training like myself that develop and test such treatments.

10. I have previously provided two expert reports dated January 29, 2025, and February 12, 2025, in response to questions that were put to me by the firm of Cleveland & Doan related to the flock of ostriches (Herd) located at the Universal Ostrich Farms Inc. (UOF) near Edgewood, B.C. and the risks of transmission of the H5N1 strain of influenza, which is responsible for the current waves of highly pathogenic avian influenza (HPAI). Counsel for the Respondents declined the opportunity to cross examine me on my qualifications or the contents of my reports.

PART 2: COMMENTS RELATED TO THE AFFIDAVIT OF DR. SUMINDER SAWHNEY

11. As of March 5, 2025, the CFIA lists on their website that 20 premises in Canada have active HPAI virus infections and another 511 HPAI infections were previously documented, which has resulting in the culling of 14,566,000 birds in Canada.[1] With at least 531 separate outbreaks of HPAI in domestic bird flocks, and a policy of originally 28 days without avian influenza infections for "free status", it would seems that Canada has not held such status for at least 3 years, although a stamping out policy has been in effect since 2004 starting in British Columbia. Moreover, since the HPAI virus remains rampant and unchecked in the wild fowl population, it is hard to envision how Canada would achieve such status, which is now even harder with the new 3-month requirement for no cases of HPAI outbreaks. In any event, without the HPAI "free status" it is evident that Canada has still been able to continue its trade in products from commercial poultry operations (see Exhibit "F" of Dr. Sawhney's affidavit for exported bird products).

12. Dr. Sawhney discussed in para. 50 of his affidavit about how Canada would not accept poultry-related products from France, because this country adopted a preventative program that involved vaccination of poultry against HPAI. South Africa ultimately also permitted the

[1] https://inspection.canada.ca/en/animal-health/terrestrial-animals/diseases/reportable/avian-influenza/latest-bird-flu-situation/investigations-and-orders#dataset-filter

vaccination of poultry in their commercial industry, but adopted strict guidelines for those farms that adopted this practice. One issue is that it is difficult to distinguish the production of antibodies in vaccinated birds from the vaccines and from natural infection. Influenza vaccines also have a significant breakthrough infections; by moderating the signs of infections, infected birds may be more able to transmit the disease, although with much reduced viral loads.

PART 3: COMMENTS RELATED TO THE AFFIDAVIT 2 OF DR. CATHY FURNESS

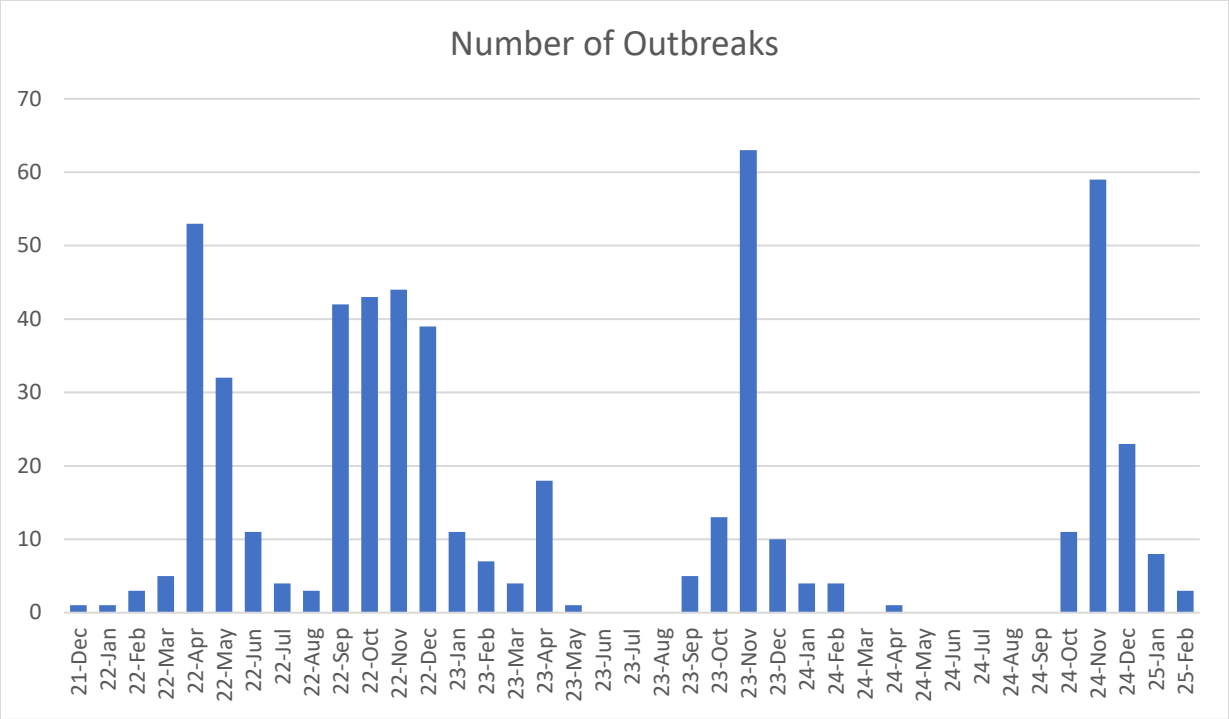
13. In para. 6 of Dr. Furness's affidavit, she noted that she is involved in Canada's planning and preparedness for HPAI in dairy cattle. Although there are no reported cases of HPAI in cattle in Canada, there have been outbreaks in 17 states in the US that has resulted in around 966 infected herds of dairy cows since March 25, 2024.[2] In the US, the policy of stamping out is not implemented for HPAI-infected dairy cattle, but rather they are isolated, treated for their illness and allowed to recover. It begs the question of whether the CFIA will follow the US lead with respect to not stamping out HPAI-infected dairy cattle in Canada. However, like cattle, ostriches are large and expensive animals, and one should expect consistency. HPAI infected cattle pose a greater risk to human health than ostriches, since they are mammals like humans.

14. The best protection against future infections appears to be from recovery from a natural infection, which is not at all considered with the current CFAI policy or the WOAH guidelines in Chapter 10.4 of the Terrestrial Code. Presumably, if a bird can be demonstrated to already possess antibodies that immunoreact with H5N1 viral proteins, and they are not sick or shown to be PCR- or rapid antigen test-positive for the virus, even if others in the flock have evidence of a HPAI infection, it is illogical to cull them too since they have already successfully recovered from an H5N1 virus infection.

Figure 1. Monthly frequency of HPIA outbreaks in Canada (includes non-commercial, and no-poultry as well) from December 2021 to February 2025. Data was retrieved from the CFAI

[2] https://www.avma.org/resources-tools/animal-health-and-welfare/animal-health/avian-influenza/avian-influenza-virus-type-h5n1-us-dairy-cattle

website.[3] Note that although the wild bird migrate southward in the spring and northward in the autumn in British Columbia, the HPIA outbreaks are primarily in the late fall in the last three years, and much less so during the spring migration. Consequently, the risk of wild birds getting infected with H5N1 in the spring and summer is very low.



15. In para. 67, Dr. Furness reiterates that "*quarantine and the use of additional testing are not "treatment" within the meaning of subsection 48(2) of the HAA, and are also not considered by CFIA to be an appropriate mitigative measure for HPAI."* Again, this disregards acquired natural immunity, which should be potentially higher in long-lived birds such as ostriches. I suspect that this is not such a hard and fast policy when it comes to larger animals such as dairy cows should they become infected with HPAI virus. The CFAI has adopted the stamping out policy for foot and mouth disease in cattle, which is highly contagious, and can result in 100% morbidity in a herd, be fatal in young cattle, and result in permanent reduction in milk production. By contrast, HPAI infection of cattle are rarely fatal with typically 10-20% morbidity, and less than 5% of these sick

[3] https://inspection.canada.ca/en/animal-health/terrestrial-animals/diseases/reportable/avian-influenza/latest-bird-flu-situation/investigations-and-orders#dataset-filter

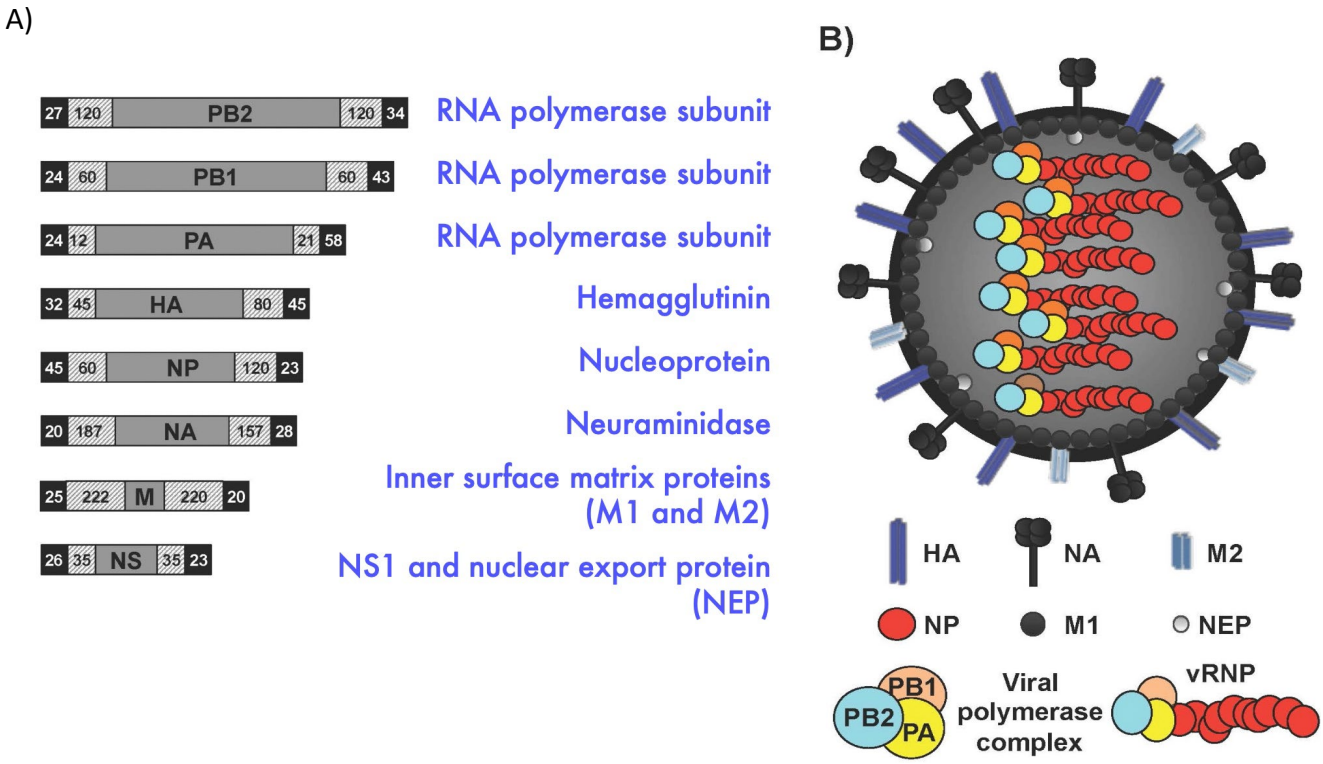
cattle die. In the US, they are not routinely using a stamping out policy for entire cattle herds with evidence of H5N1 influenza infection.

16. In para. 78, Dr. Furness disclosed that the specimens collected from the deceased ostriches from the UOF site were subjected to full genome sequencing of the 8 chromosomes of the HPAI virus (a chromosome is a separate fragment of the genome of an organism). This is why the CFAI had suggested without any clarification of the methodology used that "*the HPAI strain detected in the ostriches at UOF represents a unique reassortment (genotype) of H5N1 not previously identified in Canada."* This analysis was apparently undertaken in early January, 2025, and the data was available to the CFAI on January 8, 2025, based on the time stamp of the report (Exhibit "T"). It is unclear whether this viral genome sequencing was performed on the samples from both ostriches separately or mixed together, although it seems that the samples were pooled. If both birds had the same reassortment, this increases the prospects that the wild duck that originally infected the flock may have already had this reassortment. Such a reassortment is more likely in a flock of hundreds of different freely travelling ducks than in a relatively small and contained herd of ostriches. According to this report, from the result of the 2 vials/submitter samples, it is indicated that "*genes segments PB2, PA and NP belonging to North American lineage and gene segments PB1, HA, NA, M and NS belonging to Eurasian lineage*" were identified. This means that five of the viral chromosomes arose from a high pathogenicity avian influenza virus (*i.e.,* H5N1 2.3.4.4b clade) and three of the viral chromosomes arose from a low pathogenicity avian influenza virus (not specified in the report). Figure 2 provides a diagram of the genetic organization of the influenza virus genome. More information about the reassortment of influenza A virus chromosomes is available in Dadonaite *et al.* (2019).[4]

Figure 2. **Influenza A virus (IAV) genome organization and virus particle (virion) structure.** (**A**) Genome organization: The eight single-stranded, negative-sense, viral (v)RNA segments PB2, PB1, PA, HA, NP, NA, M and NS of IAV are shown. M encodes the inner surface envelop matrix 1 (M1) protein and the ion channel matrix 2 (M2) protein. NS encodes the NS1 protein and nuclear export protein (NEP). The Black boxes at the end of each of the vRNAs indicate the 3' and 5' non-

[4] Dadonaite, B., Gilbertson, B., Knight, M.L., Trifkovic, S., Rockman, S., *et al.* (2019) The structure of the influenza A virus genome. Nat Microbiol. 4(11):1781-9. doi: 10.1038/s41564-019-0513-7. https://pmc.ncbi.nlm.nih.gov/articles/PMC7191640/

coding regions (NCR). Hatched boxes indicate the packaging signals present at the 3' and 5' ends of each of the vRNAs that are responsible for efficient encapsidation into nascent virions. Numbers represent nucleotide lengths for each of the NCR and packaging signals; (**B**) Virion structure: IAV is surrounded by a lipid membrane bilayer containing the two viral glycoproteins hemagglutinin (HA), responsible for binding to sialic acid-containing receptors; and neuraminidase (NA), responsible for viral release from infected cells. Also in the virion membrane is M2 protein. Under the viral lipid bilayer is a protein layer composed of M1 protein, which plays a role in virion assembly and budding; and NEP involved in the nuclear export of the viral ribonucleoprotein (vRNP) complexes. Underneath is the core of the virus made of the eight vRNA segments that are encapsidated by the viral nucleoprotein (NP). Associated with each vRNP a complex is the viral RNA-dependent RNA polymerase (RdRp) complex made of the three polymerase subunits PB2, PB1 and PA that, together with the viral NP are the minimal components required for viral replication and transcription. This figure and information are reproduced from Breen *et al.* (2016).[5]



[5] Breen, M., Nogales, A., Baker, S.F., Martinez-Sobrido, L. (2016) Replication-competent influenza A viruses expressing reporter genes. Viruses. *8*(7):179. https://doi.org/10.3390/v8070179

17. More insight into the results of the genome sequencing of the H5N1 influenza virus recovered from the two UOF ostriches that died and were tested by the CFAI is revealed in an internal January 4, 2025 e-mail memo between CFIA AI Lab Liaison to CFIA AI Commander (see Exhibit B for full memo). In particular, it is stated:

> *"The entire genome of the virus was amplified from two original swab samples and submitted to our Genomics group for NANOPORE sequencing. Eight gene segments of the virus were sequenced. The HA of the virus from the samples belong to Eurasian Gs/GD lineage HPAI H5N1 (2.3.4.4B) with cleavage site motif of "PLREKRRKR/GLF" compatible with HPAI viruses that came to Canada via the Pacific flyway. The H5N1 virus is a reassortant virus with PB2, PA, and NP originated from North American lineage* ***low pathogenic avian influenza virus****, and PB1, HA, NA, M and NS gene segments from Eurasian viruses. The virus is similar to the D1.1 viruses circulating in North America, but has the neuraminidase segment identical to WIN-AH-2022-OTH-0033 virus. PB2 627E (avian)."*

18. This correspondence confirms that three of the chromosomes (specifying the PB2, PA and NP genes) found in the retrieved samples of the influenza strain were derived from a low pathogenicity strain of avian influenza virus. It also indicates that the PB2 gene featured the E627 allele of this RNA polymerase subunit. This is important, because it is the E627K variant that has been linked with more pathogenic strains of H5N1 that can infect mammals.

19. The PB2 protein is a subunit of the viral RNA polymerase (the enzyme complex that transcribes the viral genes to make mRNA's to produce the viral proteins and allows for replication of the genome of the virus to make new virus particles), and it has also been implicated in inhibition of interferon expression by associating with the mitochondrial antiviral signalling (MAVS) protein.[6] The avian version of PB2 does not normally support mitochondrial import of this protein, and its ability to suppress immune responses via inhibition of PB2. The normal PB2-E627 form of the

[6] Long, J.C., Fodor, E. (2016) The PB2 subunit of the Influenza A virus RNA polymerase is imported into the mitochondrial matrix. J Virol. 90(19):8729-38. doi: 10.1128/JVI.01384-16. https://pmc.ncbi.nlm.nih.gov/articles/PMC5021425/

avian H5N1 is highly impaired in its ability to infect mammals.[7] However, this is compromised with PB2 E627K or D701N mutations.[8] However, it appears that the PB2 gene in the virus isolate from the UOF ostriches does not contain the E627K mutant, which the CFAI has been concerned might increase infectivity of humans with H5N1 influenza.

20. The bottom line is that the variant of H5N1 detected in the two ostriches was likely evolved from a mutated form of the H5N1 influenza virus that contains the surface proteins of the high pathogenicity, 2.3.4.4b clade of the avian influenza virus, which was already present in the infected ducks that transmitted the virus to the ostriches. However, due to the substitution of the three of the viral genes for internal proteins in the influenza particles that are critical for its replication of the virus with variants from a less pathogenic strain, it has lower virulence than found with the HPAI 2.3.4.4b clade. It is also less likely to cause illness in humans and other mammals that are infected, because it does not feature the PB2 – E627K mutation.

21. The emergence of a less virulent but more infectious variants of a virus, as may be the case with the medium pathogenicity strain of H5N1 influenza virus in the UOF ostriches, is actually typical. With reduced pathogenicity, the infected host is less sick and more likely to successfully transmit the virus to other hosts, since the normal behaviour of the animal is less affected. However, because it features nearly identical viral surface proteins, the immunity that it induces in the host protects it well from future infections with HPAI strains. This phenomenon is exemplified by how the more infectious, but more benign Omicron variants were able to rapidly out compete the earlier SARS-CoV-2 variants during the SARS-CoV-2 pandemic. Thus, the H5N1 variant discovered in the UOF ostriches may actually perform as a natural attenuated vaccine against the more pathogenic versions of the H5N1 influenza virus.

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[7] Bogs, J., Kalthoff, D., Veits, J., Pavlova, S., Schwemmle, M., *et al.* (2011) Reversion of PB2-627E to -627K during replication of an H5N1 Clade 2.2 virus in mammalian hosts depends on the origin of the nucleoprotein. J Virol. 85(20):10691-8. doi: 10.1128/JVI.00786-11. https://pmc.ncbi.nlm.nih.gov/articles/PMC3187502/

[8] Steel, J., Lowen, A.C., Mubareka, S., Palese, P. (2009) Transmission of influenza virus in a mammalian host is increased by PB2 amino acids 627K or 627E/701N. PLoS Pathog. 5(1):e1000252. doi: 10.1371/journal.ppat.1000252. https://pmc.ncbi.nlm.nih.gov/articles/PMC2603332/

22. In para. 96, Dr. Furness argued that "*testing cannot wholly evaluate the current and future risk of disease spread posed by an entire flock of confirmed infected birds continuing to exist on a known contaminated premises*." Basically, the point of the culling is to prevent the spread of the H5N1 virus. Yet, the CFAI chooses to ignore any evidence that the infected flock no longer is shedding the virus and that natural immunity has been established by way of production of neutralizing antibodies, all of which can be easily tested for. Moreover, it has forbidden any treatment or testing of the ostriches following the culling order that it issued to the UOF owners. It should also be appreciated that it is not necessary to individually test birds for shed virus with PCR- or rapid antigen tests, and pooled samples are sufficient for detection.

PART 4: COMMENTS RELATED TO THE AFFIDAVIT 2 OF DR. SHANNON FRENCH

23. In para. 21, Dr. French noted that "*unlike chickens and turkeys, many ducks (for example a flock only showing decreased egg laying) will recover from the infection*." This probably reflects the establishment of a level of natural herd immunity possibly from recovery from prior infection with HPIV or a highly related avian influenza strain. With the culling that occurs with domestic chickens and turkeys, such herd immunity is unable to develop.

24. In para. 22, Dr. French cited studies by Abolnik *et al.* (2007)[9] and Van Helden *et al.* (2016)[10] to support the contention that adult ostriches can shed virus without any clinical signs. However, these studies were not based on the HPAI H5N1 strains that are more virulent and likely to cause illness. The Abolnik *et al.* (2007) publication is actually based on the H6N8 and H9N2 avian influenza viruses and the Van Helden *et al.* (2016) publication is likely based on H5N2. This latter

[9] Abolnik, C., Bisschop, S., Gerdes, T., Olivier, A., Horner, R. (2007) Outbreaks of avian influenza H6N2 viruses in chickens arose by a reassortment of H6N8 and H9N2 ostrich viruses. Virus Genes. 34:37-45. doi: 10.1007/s11262-006-0007-6. https://pubmed.ncbi.nlm.nih.gov/16927114/

[10] Van Helden LS, Sinclair M, Koen P, Grewar JD. (2016) Description of an outbreak of highly pathogenic avian influenza in domestic ostriches (Struthio camelus) in South Africa in 2011. Preventive Veterinary Medicine. 128:6-11. https://doi.org/10.1016/j.prevetmed.2016.03.019

article stated that "*the presence of clinical signs on the farms was included in the case definition but did not play a large role in identifying infected properties, as the majority of positive farms did not subjectively show an increase in morbidity or mortalities of ostriches*." In view of the high rate of false-positives with the PCR test at the thermal cycle thresholds that were likely used, it is not clear that all of the birds were even necessarily infected.

25. In para. 24, Dr. French cited the publication by Abolnik *et al.* (2021)[11] to support the contention that ostriches without clinical signs of illness can shed influenza virus into the environment. This is based on H7N1 low pathogenic avian influenza (LPAI) and H5N8 HPAI viruses, and **not** the H5N1 HPAI virus, and the infection of 7-week-old ostriches, which are likely to have little immunity initially. Antibodies against H5N8 HPAI virus and H7N1 LPAI virus only appeared after day 7 post exposure, with higher antibody titres induced by the HPAI virus compared to the LPAI virus. By 14 days post-infection, there was little if any detectable shedding by PCR testing even with 40 thermal cycles. Live virus cultivatable in eggs was not detected from the H7N1 LPAI virus if more than 30 thermal cycles was required for amplification of the viral RNA by PCR. The authors concluded that their findings "***show that LPAI and HPAI viruses are unlikely to circulate at low levels or for short periods within ostriches***."

26. In para. 24, Dr. French claimed that "*AIV have been demonstrated to survive for months or **even years** in fresh water at low temperatures, so allowing the virus to spread through a herd has the potential to create a large source of infective virus that will remain in the area even after the individual ostriches have recovered and are no longer shedding the virus themselves*." This unlikely scenario is based on a single study with a duration of up to a year by Ramey *et al.* (2022)[12] using PCR detection with up to 44 thermal cycles as corresponding to a positive result. While "positive samples" were subsequently tested via inoculation of embryonating chicken eggs, it seems highly improbable that the virus would be stable in a non-sterile environment, and it would

[11] Abolnik, C., Ostmann, E., Woods, M., Wandrag, D.B., Grewar, J., *et al.* (2021) Experimental infection of ostriches with H7N1 low pathogenic and H5N8 clade 2.3. 4.4 B highly pathogenic influenza A viruses. Veterinary Microbiology. 263:109251. https://pubmed.ncbi.nlm.nih.gov/34656859/

[12] Ramey, A.M., Reeves, A.B., Lagassé, B.J., Patil, V., Hubbard, L.E., *et al.* (2022) Evidence for interannual persistence of infectious influenza A viruses in Alaska wetlands. Science of the Total Environment. 210;803:150078. https://royalsocietypublishing.org/doi/full/10.1098/rspb.2020.1680

likely become highly diluted in a pond or stream so the viral load would be very low. Moreover, this study was performed with the H5N2 influenza virus and not an H5N1 strain.

27. In para. 25, Dr. French argued that mutations can occur in avian influenza viruses that might foster cross-species transmission, especially since ostriches are allowed run more freely and potentially interact with wild animals. Firstly, the rate of mutation of the influenza viruses is dependent on the genome and its encoded proteins, such as the error rate in the viral RNA polymerase complex that facilitates its replication and not so much from mutations of host proteins. The rate of mutation in a host species is orders of magnitude much slower than a virus or bacteria. Efficient replication of a virus requires an optimization of the virus in its evolution for successfully entering, hijacking and exiting from the host's cells. The PB-E627K mutation referred to by Dr. French, which increases infectivity in mammals, was shown by the CFAI **not** to be present in the H5N1 virus RNA isolated from the UOF ostriches as discussed in para. 17 to 20 above. Secondly, historically farms were in more open environments where livestock tended to be more mobile, and grazed in wide spaces on diverse vegetation and exposed to more microbes. In a natural environment, ecosystems are extremely complex with a high degree of inter-species interactions. In the large factory farms that now dominate in the livestock industry, the animals are often confined and kept in high density, often under stressful conditions. This increases the prospects for infection by a pathogenic virus or bacteria, since stress reduces the effectiveness of immune systems and cramped conditions foster infectious disease spread. Furthermore, if we accept Dr. French's argument, then open farms should really be banned outright in general, not just ostrich farms. Moreover, we should also be discouraging the establishment of zoos, game farms, animal shelters and even wild bird refuges, since these allow the mixing of diverse species in crowded surroundings. People should also not have pets such as dogs, cats or rodents, since this also increases the chances of the spread of infectious diseases by zoonosis (*i.e.*, the spread from animals to humans).

28. In para. 28, Dr. French argued that enforcement of a stamping out policy is the best way for "*minimizing viral transmission and contamination of the environment, with the final intention of viral eradication*." However, with such a wide range of wild animals that can be infected and

transmit the H5N1 influenza virus, there is too large a reservoir of the virus to ever hope to eradicate it from the domestic animal and human populations. The biosecurity measures would have to be so draconian that the domestic animals on the farms would be even more inhumanely treated. Curtailment of the spread of a pathogenic virus or bacteria is more likely achieved by acquisition of natural immunity, breeding between survivors with genetics that confer more resistance to the pathogen, and the natural evolution of the pathogen to more infectious and benign forms.

29. In para. 30, Dr. French suggested that the stamping out policy has successfully stop previous HPAI outbreaks since 1957. However, as illustrated in Figure 1, influenza outbreaks tend to be seasonal, and largely wane over a few months on their own accord even without a stamping out strategy. This is clearly evidence, for example, in the rise of the flu in human populations during the winter months in the Northern hemisphere, and during the summer months in the Southern hemisphere. It is hard to rule out that the displacement of more virulent strains by more benign and infectious strains, and acquisition of herd immunity are not also contributing to a decline in an epidemic or pandemic of a pathogen. Ultimately, it is a matter of debate whether the mass culling of all of the birds in a flock or herd results in better overall animal welfare, as compared to having a few die and most recovering from an infection with resulting herd immunity and protection from future infections.

30. In para. 39, Dr. French noted that while HPAI illness may start in the respiratory tract in birds, it can progress to the brain and other organs resulting in multiple organ failure. She distinguished this with the actions of HPAI in humans and other mammals, which is primarily respiratory. However, influenza viruses can exert effects in humans and mammals that also results in

neurological damage.[13] For example, recently a house cat was infected with HPAI H5N1 virus and it developed neurological damage before it was euthanized.[14]

31. In para. 40, Dr. French largely dismissed the relevance of data transmission, treatment and prevention with vaccines learned with human influenza pandemics with respect to their applicability to avian influenza outbreaks. However, a stated major concern of the CFIA was the possibility with HPAI H5N1 virus for infection, mutation to a more pathogenic form, and the generation of a pandemic in the human population.

32. In para. 42, Dr. French suggested that difficulties associated with the PCR testing protocols identified for the SARS-CoV-2 may not be applicable to a different virus, such as the influenza virus, even though both are respiratory RNA viruses with relatively few genes and similar sized genomes. The fundamental problems associated with PCR tests at high thermal cycle (CT) cut-offs is not virus-dependent. For example, Abolnik *et al.* (2021) showed that with PCR requiring 30 or more cycles, there are no replication competent avian influenza virus particles in an ostrich-derived sample.[11]

33. To my knowledge, the PCR testing for H5N1 performed by the CFIA is not externally certified. At the time that I prepared my earlier expert reports, the CFIA had not disclosed that it had performed full sequence analysis of the viral genome samples retrieved from the two dead UOF ostriches, and the PCR tests that were described were limited to the H5 gene and did not appear to test for the N1 gene. I agree now that it is highly likely that these ostriches were exposed to an H5N1 virus, although the sequencing information revealed that the strain that infected the UOF ostriches was a likely hybrid virus from reassortment mixing with low pathogenic avian virus, and as a consequence would likely be less pathogenic than an HPAI virus.

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[13] Jang, H., Boltz, D., Sturm-Ramirez, K., Shepherd, K.R., Jiao, Y., *et al.* (2009) Highly pathogenic H5N1 influenza virus can enter the central nervous system and induce neuroinflammation and neurodegeneration. Proc Natl Acad Sci U S A. 106(33):14063-8. doi:10.1073/pnas.0900096106. https://pmc.ncbi.nlm.nih.gov/articles/PMC2729020/

[14] Naraharisetti, R., Weinberg, M., Stoddard, B., Stobierski, M.G., Dodd, K.A., *et al.* (2025) Highly pathogenic avian influenza A (H5N1) virus infection of indoor domestic cats within dairy industry worker households — Michigan, May 2024. MMWR Morb Mortal Wkly Rep 74:61–5. DOI: http://dx.doi.org/10.15585/mmwr.mm7405a2

34. In para. 43, Dr. French dismissed the utility of rapid antigen tests for the presence of active shed virus from birds of an infected flock, because the CFAI does not use such tests, even though they are more rapid, cheaper and convenient to use than PCR tests. Such H5N1 influenza rapid antigen tests are already commercially available, and they should not be ignored as a complementary strategy to monitor viral shedding on-site.

35. In para. 44, Dr. French questioned whether it was possible to develop antigens for antibodies that could distinguish different H5N1 avian virus variants. However, the epitopes for antibody recognition can be as little as a single amino acid in a peptide sequence from an antigen protein. [Peptides are polymers of two to 50 or more amino acids like beads on a chain. Proteins are longer and can feature hundreds to thousands of amino acids.] In my own lab, we have routinely developed hundreds of polyclonal antibody preparations from the serum of immunized rabbits that can distinguish a difference of the phosphorylation state of a single amino acid in an otherwise identical peptide sequence.

36. It is completely feasible to develop assays that can distinguish between different mutant forms of the various influenza proteins and even neutralizing antibodies against the hemagglutinin protein, which allow the virus particle to attach and enter host cells. For example, neutralizing monoclonal antibodies were developed against the Wuhan SARS-CoV-2 spike protein that did not work on the Omicron variants. A single amino acid change in an epitope recognized by an antibody in an antigen can result in a profound loss of immunoreactivity.

37. In para. 45, without offering any evidence to the contrary, Dr. French disagreed with my suggestion that the study of the antibody reactivity of the naturally infected UOF ostrich herd would be a good starting point to develop a diagnostic test. This is certainly an approach that we took at my company Kinexus Bioinformatics in development of a 40-marker antibody test (against 8 of the SARS-CoV-2 proteins) that we used in a 4500-person clinical study. This blood test first involved the careful screening over 6000 possible peptide fragments predicted from the amino acids sequences of the 28 proteins encoded by the SARS-CoV-2 genome and testing with the serum from hundreds of patients that were naturally infected with SARS-CoV-2 (usually confirmed by PCR) and had symptoms of COVID-19. As shown in my February 12, 2025 expert

report, we were able to identify several portions of the hemagglutinin and neuraminidase proteins of H5N1 that were highly immunoreactive in antibodies tested in the egg yolks from UOF ostriches collected in the summer of 2024.

38. In para. 46 of her report, Dr. French correctly pointed out that the sensitivity and specificity of a serological test is dependent on having samples from infected and non-infected birds or their eggs, and performing proper controls. It would be ideal to have samples from animals that were confirmed to be PCR or rapid antigen positive to follow their antibody levels, especially for specific epitopes. However, the policy of the CFIA to not permit the testing of the ostriches during and after the infection has made this difficult. Nonetheless, the most commonly recognized basis of immunity is that the human or animal possess antibodies that can clearly recognize a peptide sequence from an infectious pathogen. The more different epitopes unique to the pathogen that are detected in a specimen from the person or animal, the greater can be the confidence that they have recovered from an infection and have future protection from that or highly related pathogens.

39. In para. 49, Dr. French concurred that in her opinion, "*it is reasonably possible that the birds may have no longer been shedding virus by January 29, but it is impossible to say with any degree of certainty. The reality is that we simply do not know what the disease status of the birds was at that time*." Since the birds have continued to show no signs of an ongoing influenza infection at the UOF up to March 7th, when Dr. French signed her affidavit, and now true up to March 31st[h], the likelihood that the UOF ostriches present a threat for spread of the HPIV only continues to decline.

40. In para. 50, Dr. French noted that in a study of 929 ostriches on South African farms,[15] that "*roughly 90% of the flock had antibodies to influenza (had seroconverted)*." While 90% of the birds in the herd had evidence of antibodies against the HPAI virus, PCR testing with a positive result was done on only one combined sample. It is likely that most of the birds were infected

[15] Abolnik, C., Fehrsen, J., Olivier, A., van Wyngaardt, W., Fosgate, G., Ellis, C. (2013) Serological investigation of highly pathogenic avian influenza H5N2 in ostriches (Struthio camelus). Avian Pathology. 42(3):206-14.

with the H5N2 or a related virus (not H5N1), and had only low levels of infection that did not cause serious signs in the birds. In this study, the detection of 17% of sera from a farm (identified as Farm AI18) that contained H5-specific antibodies, had no NP-specific antibodies (NP is one of the influenza virus proteins – see Figure 2). It also appears that the presence of anti-N2 antibodies was not assessed in this study. Consequently, it is feasible that many of the ostriches tracked and culled may have been infected previously with low pathogenicity H5 influenza strains. It was probably unnecessary to cull this herd.

41. In para. 53, Dr. French acknowledged that "*given all the variables, we simply cannot say with any certainty whether any individual ostriches were transmitting virus on January 29" at the UOF site.*" In view of this lack of knowledge, it would be prudent to perform PCR tests and serological tests on the ostriches before any of these ostriches are culled. This information would be valuable in understanding the effectiveness of natural immunity in this species against the H5N1 influenza virus.

42. In para. 59, Dr. French disagreed that the lack of deaths from the December 2024 – January 2025 infection of the ostriches at the UOF site that were established before 2021 could be due to natural immunity against a previous avian influenza infection. She noted that younger birds are more susceptible to death from infection. However, in my previous expert reports, I did not refer specifically to younger birds, and many of the birds that were added to the herd after 2020 were in fact older birds. Within the entire group of UOF 450 ostriches, there appears to be a 16% mortality rate, assuming that all of the birds were exposed to the virus, which is likely since 69 birds died. However, since none of the birds on the UOF site fromm prior to 2021 died, this is a 0% mortality rate, and strongly supports natural immunity. However, immune status can only be achieved by actually testing for antibodies, and under control conditions, looking at morbidity and mortality rates when birds are actually infected in a pre-clinical study.

43. In para. 60, Dr. French disagreed that the UOF ostrich herd could actually provide protection to wild birds, at least in a significant way. Surely, if the ostriches have herd immunity, they will not be passing on the virus to virus-naive wild ducks and geese that may land on the farm. I do agree that the ostriches will have little impact on the overall transmission of H5N1 to other commercial

livestock whether they were infected or not, or be transmissible or not for the virus in view of the relatively small size of the ostrich herd and the hundreds of thousands of ducks and geese that migrate through BC annually, and the actual portion of these wild birds that specifically frequent the UOF site. The main value of preserving the UOF ostrich herd is for the valuable information that they can provide about the effectiveness and duration of natural immunity, and the important products that can be developed from the production of antibodies in their eggs for a wide range of applications, including the detection and treatment of avian bird flu in animals and humans.

44. In para. 61, Dr. French suggested that even if the UOF ostriches have natural immunity against the particular avian influenza strain that infected them in the December 2024-January 2025 period, they could still become infected with new variants of the influenza virus the following spring. She further proposed that the birds may still harbor the original influenza strain that infected them, and exposure to new variants could trigger further reassortments of their chromosomes to produce additional variants. If the ostrich herd was culled and replaced with new and likely younger ostriches that are naïve to the H5N1 virus, the chances of infection leading to sickness and death is actually much higher than with the existing herd that has already survived the infection outbreak. The sequences of the various influenza virus proteins actually have a high degree of amino acid identity and similarity amongst the various influenza strains. Since infection of the ostriches induces a polyclonal antibody response, it would seem most likely that a high degree of immune protection would be afforded to the birds. Repeated exposures of these long-lived birds would likely naturally booster and further expand their immunity to future influenza variants. It seems highly improbable that the influenza virus would be maintained at even low levels for 6 months to a year in the ostriches to allow for potential recombination with other variants of avian influenza virus during the following migratory seasons.

45. In para. 62, Dr. French expressed the concern that HPAI virus-naïve birds could come to the UOF site and become infected by shed virus from the ostriches. However, any avian influenza virus that infected the ostriches would likely have already been placed earlier into the environment by infected migratory wild fowl. It seems much more likely that the HPAI virus-naïve birds will get

infected from other wild birds than from the UOF ostriches and certainly more likely at one of the thousands of other ponds and streams throughout British Columbia than from the two at the UOF site.

46. In para. 63, Dr. French again mentioned her concern that the immune protection afforded to the UOF herd following exposure to the H5N1 strain they encountered during the recent outbreak on the farm may be insufficient against a future variant of the influenza virus. The amino acid sequences of the 10 influenza virus proteins actually exhibit a high degree of amino acid identity and similarity amongst the various influenza strains. Any mutations that might be further generated in the H5N1 strains is usually restriction to less than 1% of the overall primary amino acid structures of the virus's proteins. Most mutations compromise the infectivity of the virus, which is highly optimized for its normal host species. Consequently, the vast majority of the polyclonal antibodies that recognize avian influenza virus in these birds, along with their T-cell immunity, should still provide strong protection against newer variants.

47. In para. 69, Dr. French questioned whether UOF ostrich herd has acquired “resistance” to the H5N1 virus, despite the evidence of no deaths in the ostriches on the farm in the group on site prior to 2021 and the presence of detectable anti-H5- and anti-N1-specific antibodies in the yolks of the eggs from these ostriches collected in the summer of 2024. No arguments are offered by her to counter the claim that having ostriches that are more resistant to future influenza virus infections would not be useful for preventing further infection and spread. This is the basis for the concept of “herd immunity.” While the repertoire of antibody producing B-cells that an animal is born with is partly generated de novo by mutation *in utero* in the B-cells, it is also partly hereditary. Consequently, it is reasonable that careful breeding with ostriches that survived their infection with H5N1 virus might be able to allow increased resistance to the virus in their off-spring.

48. In para. 70, Dr. French pointed out the antibody reactivity in the egg yolks from the ostriches that were tested by Kinexus may not have arisen from an HPAI H5N1 variant. That is correct. However, the fact remains that all of the birds that were tested for the presence of the H5-specific and N1-specific peptide sequences demonstrated immune reactivity against multiple epitopes, and they

did not succumb to the influenza strain that infected the flock in December 2024. If these ostriches were now tested, I fully expect that their antibody levels that can target the HPAI H5N1 would be boosted and much stronger signals would be evident on the immunoblot tests from Kinexus shown in Figure 3 of my February 12, 2025 expert report.

49. In para. 71, Dr. French noted that animals are commonly used for production of antibodies for research purposes, but there could be batch to batch issues related to reproducibility of results. Polyclonal antibodies for commercial purposes are routinely produced in larger animal species such as horses, goats, and donkeys. The yield from an ostrich egg is sufficiently high, and following affinity purification, would have the desired purity and specificity for industrial applications such as diagnostic kits and therapeutic antibodies. The UOF has already been involved in partnerships to develop antibody-based products for a wide range of applications such as treatment of acne, digestive enzyme neutralization in the gut for weight loss and reduction of blood triglycerides and sugar in diabetics, reduction of bacterial contamination of food, cosmetics and tooth paste, and improvement of masks and filters for protection against SARS-CoV-2 and other viruses and allergens.

50. In para. 72, Dr. French was unsure if selective breeding of ostriches that fully recover from infection with HPAI can permit development of more AIV-resistant birds. The fact that these birds can breed within a couple of years and produce so many eggs in a season for over 55 years makes them highly suitable for genetic improvement in infectious disease resistance. The survival from infection would be an important criterion in a careful breeding program. Another criterion would be how marked is the antibody response in the birds when immunized with portions of the HPAI proteins such as hemagglutinin (H) and neuramidase (N).

51. In para. 75, Dr. French concurred that it is not unreasonable that the UOF ostriches are no longer shedding active avian influenza virus, but to be certain, she suggested that each ostrich should be individually tested. Rather than the costly testing of individual birds by PCR, combined specimens from multiple birds can be tested on an ongoing basis. Rapid antigen tests could also be performed. Such antigen tests could use antibodies that are generated and available in the yolks of recently produced ostrich eggs following affinity purification with peptides with amino

acid sequences from H5N1 virus proteins that were found to be high immunogenic (i.*e*., antibody reactive) in the Kinexus-based tests.

52. In para. 76, Dr. French referred to PCR-based studies that indicate that viral shedding of H5N8, and other low and high pathogenic H5 influenza strains may be beyond 14 days even though the birds may present no clinical signs. The problem with all of these studies is that the PCR tests used do not necessarily detect replication competent virus particles, but rather degraded fragments of the virus that may arise from their destruction by immune cells. At 40 thermal cycles of amplification of the viral RNA in the test samples, the false-positive rate for replication-competent virus likely exceeds 95%. Note that with each thermal cycle the amount of genetic material is doubled with the polymerase chain reaction. Thus, with 40 cycles, the original starting amount of RNA is increased by 2^{40} (or 1.1×10^{12}). With each thermal cycle, the chances of false amplifications and mutations in the generated nucleotides induced by the polymerase also increases.

53. In any event, by 14 days after infection, the titers of the detected viral RNA fragments were extremely low and mostly undetectable within a week following initial infection. Since the UOF ostriches have continued to show no signs of sickness or infection since January 15th, over 9 weeks ago, the chances that any ostriches in the herd are shedding active virus in levels that support transmission is exceedingly remote.

54. In para. 77, Dr. French questioned the relevance of studies of human transmission of respiratory viruses like influenza to how the viruses are transmitted in birds, which are deemed to be less hygienic. Nevertheless, the basic principles of the chain of infection apply to animals as well as humans, and often humans may be found in less hygienic conditions too.

55. In para. 78, Dr. French suggested that it is the drinking water that is the main source of transmission of influenza for ostriches. While the study by Abolnik *et al.* (2021)[11] that she cited indicates that the H7N1 virus could be detected in drinking water from infected ostriches by PCR tests, it was not tested whether this was replication competent virus. Seven-week-old chicks were used in this study, with initial infection by direct inoculation. It was not evaluated whether the birds that acquired subsequent infection was via the shared water.

56. It remains controversial whether influenza virus can really be spread through drinking water.[16] Influenza virus is classified as a respiratory virus because that is the main means of its transmission. Although the virus might contaminate drinking water, it would also become highly diluted with the large body of water in a pond or even in a water bucket. This would significantly reduce the viral load.

57. In para. 79, Dr. French asserted that "*the traditional presentation of avian influenza in ostriches is usually mild with more severe clinical illness and mortalities generally limited to younger birds unless the birds are under significant external stress. For this reason, the fact that on UOF the mortalities were observed in younger birds is what would be expected as a result of infection and should not implicitly be interpreted as a sign of preexisting exposure to this viral subtype*." As pointed out earlier, the UOF ostriches that were the most susceptible to getting sick and dying were not necessarily younger birds, but those that were not in the herd prior to 2021. The fact that many of the ostriches tested positive for anti-H5 and ant-N1 antibodies in the yolk of their eggs collected in the summer of 2024 further supports the contention that there was prior exposure to an H5N1-like influenza virus before this time.

58. In para. 81, Dr. French strongly expressed her disagreement with my previous statement that "*the possibility of mutations occurring in ostriches that would increase influenza infectivity in mammals is "extremely remote*" and stated that this was "*well documented in the literature*" without actually providing any references. I am unaware of any publications that show that mutations in avian influenza viruses that resulted in increased ability to infect and cause disease in mammals, which <u>were generated and identified first in ostriches</u>. Dr. French does cite the study by Shinya *et al.* (2009),[17] which documented that ostriches with H5N1 influenza variants PB2-E627K and D701N are more able to propagate the virus. There is certainly no

[16] WHO (2022) Guidelines for drinking-water quality: fourth edition incorporating the first and second addenda. Geneva, Switzerland: WHO Press. https://www.who.int/publications/i/item/9789240045064 https://iris.who.int/bitstream/handle/10665/352532/9789240045064-eng.pdf

[17] Shinya, K., Makino, A., Ozawa, M., Kim, J.H., Sakai-Tagawa, Y., *et al.* (2009) Ostrich involvement in the selection of H5N1 influenza virus possessing mammalian-type amino acids in the PB2 protein. Journal of Virology. 83(24):13015-8. https://europepmc.org/article/PMC/2786862

compelling reason why the risk of generation of these mutants would be higher in ostriches than any other bird. The influenza virus identified in the UOF ostriches did not have any of these types of mutations. The risk of successful transmission to a human would be much higher from an H5N1 species that has already successfully infected a mammalian host such as a dairy cow. For example, 41 of the 70 human cases of HPAI H5N1 virus identified in the US were in those working on dairy farms and 24 were in those that worked with poultry.[2]

59. In para. 83, Dr. French described how the PB2 E627K mutant of HPAI H5N1 increases its ability to propagate in mammals, and she mentioned that the RNA polymerase is more active at lower temperatures based on citation of a review by Olivier (2006).[18] While wetter and colder months are associated with increased influenza virus detection (hence the seasonal incidence of influenza in late fall in the Northern hemisphere), this is more likely due to decreased host resistance than a more active viral RNA polymerase at lower temperatures. Generally, enzymes are less active at lower temperatures than the normal body temperature. The immune system of the host is commonly more active at slightly higher body temperatures to more efficiently fight viral and bacterial infections. Identification of temperature-sensitive mutants is a common strategy to explore the role of a protein. However, in these rare cases, higher temperatures than physiological leads to a complete loss of function.

60. The body temperature of a bird is typically 40 to 42 °C, whereas in humans it is around 37°C. Ostriches have a normal body temperature of between 36 to 39°C depending on different reports, and this would not be ideal for a virus that has been evolved to propagated primarily in ducks and geese. A virus that normally infects a host will have its viral enzyme activities optimized for the environment in the host. Infection with a virus or bacteria typically induces increased temperatures in humans and animals.

[18] Olivier, A.J. (2006) Ecology and epidemiology of avian influenza in ostriches. Developments in biologicals. 1;124:51-7. https://www.researchgate.net/publication/7327440_Ecology_and_epidemiology_of_avian_influenza_in_ostriches

61. In para. 85, Dr. French noted that mutations in HPAI viruses that increase infectivity do not necessarily increase virulence and the presentation of more severe clinical disease. The basis for use of attenuated viruses for vaccines is that they are able to infect a host, but they do not replicate as fast and provide time for the immune systems to respond before it is necessary to turn on further host responses that produce sickness. Thus, if a mutation increases infectivity without causing illness, this is actually desirable provided that it does not increase virulence. This exposure may induce immunity against more pathogenic variants of the virus in the future.

62. In para. 87, and based on a study by Abolink *et al.* (2007),[9] Dr. French suggested that "*there is documented molecular evidence that an endemic strain of avian influenza that circulates in chickens in South Africa most likely originated from the recombination of two strains (H9N2 and H6N8) that occurred in ostriches."* Since South Africa has the largest commercial population of ostriches, with numbers around 350,000 birds with 350 registered ostrich farms, this speculation is not unreasonable,[19] but the number of ostriches on the UOF site is a thousand-times lower, so the chances of such a recombination with H5N1 strains is also lower by this magnitude.

63. In para. 89, Dr. French described some of the events that would be necessary for an HPAI virus to cause a serious pandemic in humans. The transmission of H5N1 influenza virus from one human to another has yet to be documented. In the one instance of a recent human infection with H5N1 HPAI in Canada, this was a 13-year-old girl that was obese and had asthma.[20] She also infected with a viral strain that had the PB2-E627K mutation. One of the other necessary changes would be mutations that would permit the hemagglutinin protein to better binds to the alpha-2,6 sialic acids found in mammals rather than the terminal alpha-2,3 sialic acid residues found in receptors in birds, reptiles and amphibians. She also mentioned that the virus has to be more transmissible as an airborne pathogen. There are many other factors that would also be

[19] https://stickymangorice.com/2021/04/09/ostrich-farming/

[20] Jassem, A.N., Roberts, A., Tyson, J., Zlosnik, J.E.A., Russell, S.L., *et al.* (2024) Critical illness in an adolescent with influenza A (H5N1) virus infection. N Engl J Med. 392(9):927-929. doi: 10.1056/NEJMc2415890. https://pubmed.ncbi.nlm.nih.gov/39740022/

necessary too. It would have to optimize for human cell physiology, better evade the immune system of humans, and also be less virulent to more widely increase transmission.

64. In para. 93, Dr. French suggested that co-infection of the same host and the same cells with two different influenza strains could transpire such that "*a virus that may cause relatively mild disease in one host could in theory cause significant disease in an abnormal host*." This seems highly unlikely as successful viruses tend to be optimized to bind to a host cell, enter and successfully replicate, and exit the host cell. Cross-species transmission of viruses is generally a rare event, considering that hundreds of thousands of different strains of viruses are believed to infect mammals, and only around a hundred are truly pathogenic in humans. If the infections from both virus strains are mild, then it is most likely that the immune system should be able to easily handle both viruses before coinfection can occur in the same host cells. The theoretical concerns raised by Dr. French that have yet to be fully manifested with the H5N1 influenza virus in mammals, and so far, after many decades, this virus strain generally leads to mild disease in mammals with very rare instances of severe illness.

65. In para. 98, Dr. French repeated her earlier concerns that having commercial birds in an open environment with access to wild birds and other animals increases the prospects of viruses crossing over to other species. By this logic, the CFAI would seem to prefer the permanent closure of livestock operations that permit their animals to roam more freely outdoors in the interests of maintaining biosecurity. This all seems fruitless if these viruses are already commonly found within the wild animal communities.

66. In para. 101, Dr. French argued that selective breeding for resistance to influenza infections is not an immediate practical response to an outbreak. While this is true, it should be part of a longer-term strategy to protect commercial livestock. Farmers have had thousands of years of selective breeding practices to create the diversity of desired characteristics found in domesticated animals today.

67. In para. 105, Dr. French suggested that allowing the development of natural immunity in a herd of animals by not intervening is not an acceptable strategy on its own to deal with an outbreak of a potentially highly pathogenic virus or bacteria. I agree. It should be combined with

preventative measures such a vaccination and other means of boosting the immune systems of animals, testing, isolation and treatment of infected animals, and should the animals fully recover, reintegration into the herd or flock. Culling of whole herds of animals on the basis of a few infected animals in the unit is not a viable, long term strategy as is now clearly evident. The concept of recognizing natural immunity, which was largely ignored during the COVID-19 pandemic, is in fact endorsed by a wide range of scientists and medical practitioners. In the case of the COVID-19, which is another respiratory disease with similar morbidity and mortality to influenza, it is the opinion of tens of thousands of doctors and scientists world-wide as documented in the Great Barrington Declaration,[21] the Public Health Agency of Sweden,[22] the conclusions of the US Congressional Select Subcommittee on the Coronavirus Pandemic,[23] the National Citizens Inquiry into Canada's response to COVID-19,[24] and the recent Alberta's COVID-19 Pandemic Response[25] report that natural immunity should be adopted as a viable approach to curtail pandemics with special attention to isolated and protect those that are of higher risk than the general population.

PART 5: COMMENTS RELATED TO THE ANTIBODY TESTING OF OSTRICH YOLK AND HUMAN BLOOD SAMPLES

68. In the previous parts of this report, I have described how the UOF ostriches are highly unlikely to be a threat for future transmission of the H5N1 influenza virus to other birds, animals and humans. Moreover, I have documented that transmission of HPAI H5N1 virus is unlikely to be a significant threat to the human population, and certainly highly unlikely to cause a highly lethal human pandemic. Nevertheless, it has had a significant impact on commercial poultry farms, and more effective strategies need to be developed than the current stamping out policy, which has its own devastating effects on commercial livestock operations, and increased food prices from egg and meat shortages. Such strategies require earlier monitoring of potent outbreaks, isolation

[21] https://gbdeclaration.org/
[22] https://en.wikipedia.org/wiki/Swedish_government_response_to_the_COVID-19_pandemic
[23] https://oversight.house.gov/release/final-report-covid-select-concludes-2-year-investigation-issues-500-page-final-report-on-lessons-learned-and-the-path-forward/
[24] https://nationalcitizensinquiry.ca/national-citizens-inquiry-issues-commissioners-final-report/
[25] https://open.alberta.ca/publications/albertas-covid-19-pandemic-response

of infected animals, better influenza disease treatment and preventative measures such as vaccination and others (e.g., vitamin D supplementation) that increase in the robustness of the immune systems of animals. Development of targeted immunity against the influenza virus strains, such as the production of specific antibodies against each strain, should also be tracked for evidence of the establishment of herd immunity against future infections.

69. In my January 29, 2025 expert report in para. 29 to 39, I outlined the uses and limitations of the polymerase chain reaction (PCR) tests for the detection of the genetic material generated following a viral infection (in Section 3.5 “Detection of Viral Infections by PCR”). This is the test that was used by the CFIA to determine whether the two recently deceased UOF ostriches at the end of December 2024 were infected with an H5-containing strain of avian influenza. When undertaken properly (not at high thermal cycle numbers), this test can be highly accurate. However, the test must be performed in a laboratory setting that is properly equipped to undertake the analysis, and it takes at least a day to complete.

70. In my January 29, 2025 expert report in para. 40 to 42, I also outlined the use and limitations of the rapid antigen tests for the detection of viral proteins generated following a viral infection (in Section 3.6 “Rapid Antigen Tests for SARS-CoV-2”). I provided information for detection of the virus that caused COVID-19 as a comparison, and noted that there several commercial rapid antigen test kits for detection of the H5N1 strain influenza viral proteins, including the CTK Biotech OnSite. Influenza A/B Ag Rapid Test,[26] the Ringbio Avian Influenza Antigen Test Kit, AIV Ag Test,[27] and GlobalDx Herdscreen GDX84-2 AIV H5 Ag Test.[28] Such tests are based on the availability of specific H5- or N1-specific antibodies on a test strip that can capture viral proteins that are present within a specimen sample. These tests can be highly accurate, but they are much less sensitive, and it is not possible to amplify the levels of a protein as it is feasible for RNA or DNA using the PCR method. However, the test is rapid and can be performed on site without special equipment, with results that are evident within a few minutes. A subclinical, asymptomatic detection of influenza would be harder to detect with this method, but it can be

[26] https://ctkbiotech.com/onsite-influenza-a-b-ag-rapid-test/
[27] https://www.ringbio.com/solutions/poultry/avian-influenza-antigen-test-kit
[28] https://globaldx.com/avian-flu/

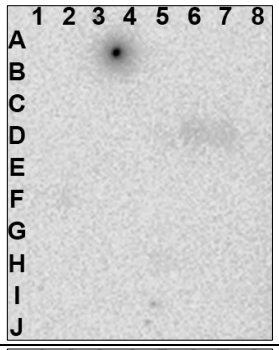
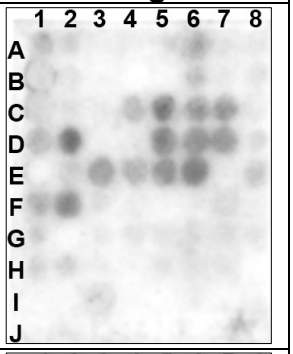
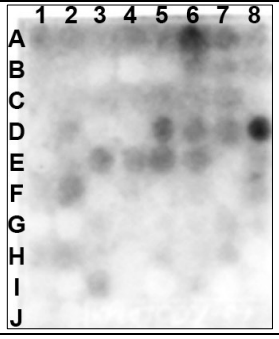
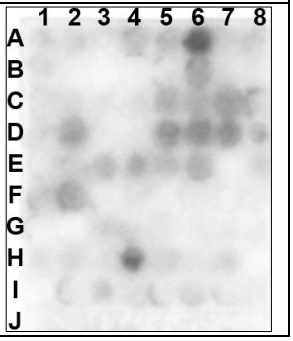
very useful for diagnosis of flu-like illnesses. I would recommend testing some of the UOF ostriches with one of the H5N1 rapid antigen tests should any of them show signs of illness in the future to help rule out an HPAI infection. It can also be used to help prove that asymptomatic ostriches are not shedding virus.

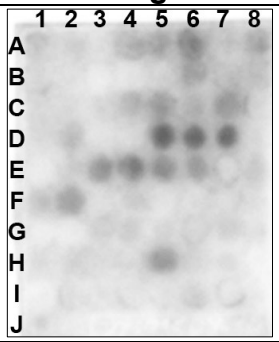
71. In para. 56 to 61 of my February 12, 2025 expert report, I provided the specifics of a serological test that was designed to test antibodies against the portions of the H5 and N1 viral proteins that were unique to the H5N1 influenza virus and not to other strain of the virus. As shown in Figure 3 of that earlier expert report, all of the egg yolk samples from 18 of the UOF ostriches collected in the summer of 2024 were found to yield multiple antibodies against the H5- and N1-derived unique peptides. This demonstrated proof of concept that such a highly sensitive test for evidence of specific immunity against this virus can be successfully developed. More recently, we obtained samples of a few drops of blood from four of the staff at the UOF. As shown in Figure 3, each of these individuals were shown to have developed antibodies that recognize the H5N1 strain of the avian influenza flu virus, although none of them had any signs of illness from the recent influenza infection on the farm. It is not surprising that these individuals have developed immune responses following their exposure to the H5N1 virus that infected the UOF ostrich herd. It also demonstrates that the H5N1 virus in the ostriches was not pathogenic in humans. However, it remains unclear when it was that the UOF staff was first infected with an H5N1 virus, and this could have been even in 2020, when the UOF had an outbreak of what was diagnosed as pseudomonas bacteria, which is usually what birds actually die from after an H5N1 influenza virus infection.

72. The Kinexus H5N1 peptide SPOT array test is much more sensitive and accurate than typical serological tests that use whole recombinant hemagglutinin or neuraminidase proteins as target antigens. Such alternative tests will feature portions of the H5 or N1 proteins that are not unique to the H5N1 strains of influenza virus and allow for false positives. However, additional research is needed in order to optimize the Kinexus SPOT array test for this virus. I suspect that the yolk samples from ostrich eggs that are collected in 2025 will have very high titres of anti-H5 and anti-N1 antibodies that are much stronger than shown in Figure 3 of my February 12, 2025 expert

report. Having strong positive, controls is important to establish specificity and sensitivity of such antibody tests. However, it is difficult to obtain such specimens, which is why I have been willing to test egg yolk samples from the UOF ostriches and staff member to determine whether the test does indeed work with other species besides birds as expected. Further work with negative controls, such as eggs from uninfected chickens and blood samples obtained in 2020 from human participants in our serological SARS-CoV-2 antibody testing clinical study are now underway.

Figure 3. H5N1 peptide SPOT arrays probed for IgA, IgM and IgG antibodies in serum from blood samples originally obtained from four human staff at the UOF in March 2025. The appearance of a dark spot indicates positive immunoreactivity with different 14-amino acid long peptides derived from the H5 hemagglutinin protein (Spots A1 to E7) and N1 neuraminidase protein (Spots E8 to J2).

Array #	Image	Array #	Image
KPL01CDY-03c T-TBS Neg. Control		KPL01CDY-06c K.E.	
KPL01CDY-07c S.		KPL01CDY-08c K.P.	

Array #	Image	Array #	Image
KPL01CDY-10c D.B.			

73. If the UOF ostrich eggs collected in 2025 do indeed have very high titres of antibodies against the H5, N1 and the other proteins found in the HPAI virus, these would be highly valuable for research purposes, to track infection with the virus in rapid antigen tests, and could potentially be used as therapeutic antibodies to treat animals and humans that are sick following H5N1 infection.

74. The CFIA has expressed concerns that ostrich samples from the UOF may contain replication-competent HPAI virus, and these should not leave the quarantine area. At this time, such concerns can be easily allayed for the following reasons:

    a) There is no evidence that there is an active infection of the H5N1 virus on the UOF site after 9 weeks since the last signs of illness in the ostriches;

    b) My previous H5N1 influenza antibody tests of yolk samples from all eggs individually collected from 18 different UOF ostriches during the summer of 2024, all tested positive for multiple epitopes for both H5 and N1, indicating the birds already had a degree of natural immunity;

    c) Eggs are naturally sterile as long as the egg shell has not been cracked or broken. The eggs acts as a very strong barrier to infection by viruses and other microbes. Consequently, egg yolks are extremely unlikely to be contaminated with the H5N1 virus. Moreover, the presence of the antibodies against the virus in the egg yolk would neutralize the virus even if it was possible to somehow infect the egg during early stages of egg formation;

d) The H5N1 strain that infected the UOF ostriches and staff appears to be of lower pathogenicity in the ostriches and not pathogenic to humans; and

e) No animals are housed at the Kinexus facility and none of the staff associate with any farms or commercial operations that have chickens or turkeys.

75. In view of the low risk associated with the testing of frozen yolks from eggs that are recently collected from the UOF ostriches, I am confident that they can be safely shipped to the Kinexus research facility in Vancouver for testing. I recommend that the yolk samples are:

a) in volumes of no more than 500 microlitres for each sample;

b) the yolk samples are transferred into 1.5-ml plastic, capped plastic Eppendorf tubes (or their equivalent);

c) the labelled individual 1.5-ml tubes with yolk samples are further placed up to 6 in a 50-ml plastic Falcon tube with a screw cap lid (or their equivalent); and

d) the filled Falcon tubes are further placed into a sealable plastic bag that is placed in a cardboard box with styrofoam or paper packing.

76. The samples should be sent to the Kinexus site in Vancouver, B.C. by courier or hand delivered by a member of the UOF staff.

77. These are the kind of procedures that are routinely taken by the over 2000 international and domestic clients of Kinexus over the past 26 years as we have analyzed their biological specimens for the presence of diverse proteins, including antibodies. Due to the high stability of ostrich IgY antibodies, it may also be acceptable to sterile the samples, as has been done with milk from cows, by standard Pasteurization at 63°C.[29]

Respectfully submitted by,

[29] https://milkyday.com/blog/2020/02/11/methods-time-and-temperature-for-milk-pasteurization/

Steven Pelech, Ph.D.

Professor,
Department of Medicine,
University of British Columbia

President and Chief Scientific Officer,
Kinexus Bioinformatics Corporation

Vice-President, and Co-Chair,
Scientific and Medical Advisory Committee,
Canadian Citizens Care Alliance

Exhibit A – March 28, 2025 Letter from Mr. Lee C. Turner from Doak Shirreff Lawyers LLP

Doak Shirreff Lawyers LLP

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Our File: 140642-1
March 28, 2025

By E-mail

E-mail -spelech@mail.ubc.ca; spelech@shaw.ca

Dr. Steven Pelech
8755 Ash Street, Suite 1
Vancouver, BC V6P 6T3

Attention: Dr. Steven Pelech

Dear Sirs/Mesdames:

Re: Universal Ostrich Farms Inc. and Canadian Food Inspection Agency
Federal Court of Canada – Docket T-294-25 (the "Action")

Further to our conversation earlier today, we confirm that we have been retained by Universal Ostrich Farms Inc.(the "**Applicant**") to obtain an expert report from you concerning options available to them to have antibody testing done of the surviving ostriches, or their eggs, in order to determine whether or not they have been exposed to H5N1, whether they are shedding the virus, and whether they have developed natural immunity, and whether they pose any risk to wildlife or humans as a result of their H5N1 exposure.

We understand you may have done some testing of eggs from these ostriches that were lead prior to the December 30, 2024 culling order and we would ask that you provide the background and results of that testing in your report. We also understand that you have recently tested the blood of the farmers who have access to these ostriches and have obtained test results concerning antibodies they may have to the H5N1 virus. **In your report can you please provide** the details of what was undertaken, including the dates that testing was done, explain the process that was undertaken to obtain this testing and the meaning of the results that were obtained with respect to risk posed by the ostriches, or the farmers, to other wildlife or human beings of spreading infection of H5N1.

Michael Carter of Cleveland Doan is still the Applicant's legal counsel at present, and he has consented to the writer contacting you for the purpose of obtaining an expert report from you as described in our letter. It is unclear at the present time whether he will continue to be the Applicant's counsel moving forward but this is expected to be known shortly. The parties attended a Case Management Conference today before Mdm. Justice Ring of the Federal Court of Canada. The hearing for final argument is set for April 15, 2025 in Federal Court in Vancouver to determine whether or not CFIA will be permitted to kill all of the surviving ostriches. We are hoping to obtain an affidavit from you in the next few days that we can attach to a motion to the court, seeking an order from the court permitting the Applicant to perform

whatever testing you recommend so that you can provide an expert opinion before April 15, 2025 concerning the results of that testing, that we could provide to the Attorney General and CFIA and the court for their consideration.

Accordingly, in addition to the opinion requested above, could you kindly provide us with your opinion concerning the following:

1. is there a test that could be performed either on the ostriches themselves or their eggs that can be performed safely by the farmers themselves on the farm, that would pose no risk of infection or transmission to other wildlife or humans, such that these test samples could then be provided to you so that you could analyse in your laboratory to determine whether or not these birds have been exposed H5N1, have developed antibodies to H5N1, whether they are immune to H5N1, and whether they pose any risk of spreading infection of H5N1 to other wildlife or humans?

2. If the answer to question 1 is yes, can you please describe test that could be done, how that sample can be safely transported to you, and what that test would tell us?

3. Please explain why the test is safe for the farmers to perform, why it is safe to transport to you, so that the reader of your report understands clearly why the test and transporting its results to you for testing would present no risk to the public or other wildlife;

4. if the test results demonstrate that the surviving ostriches have full antibodies to the strain of H5N1 that was detected by CFIA through their own testing either at the Abbotsford Lab or the Winnipeg lab or otherwise, please explain what the significance of that is with respect to the risk of transmission of the virus to other wildlife or humans and what the merits of culling the ostriches would be as a result.

Please carefully read the instructions below regarding the preparation of your report.

When you write your report, please remember that you are essentially taking on the role of a teacher in the area of your expertise. While the details of your analysis and opinion are important, what is equally if not more important is what those details mean. The reader of your report will include members of the Counsel for the Attorney General and the CFIA, the Federal Court, members of the public, and other experts who may be informed by your opinion and analysis. They need to understand your opinion and the basis for it. If you must use technical terms from your area of specialty, please define them as simply as possible in words that everyone can understand. If you are able to use diagrams, photographs, video, models or other demonstrative aids to help the reader understand your report, we encourage you to do so.

We ask that you set out in your report the following information:

1. your name, address and area of expertise (you may attach a CV as an appendix to your report). It should be clear within your CV or your description of your area of expertise, that you are qualified to offer the opinion in the areas set out above;

2. your qualifications and employment and educational experience within your area of expertise that is relevant to the opinions requested;

3. instructions that we have provided to you in relation to the proceeding, for which you can reference and attach a copy of this letter to your report if you wish;

4. the nature of the opinion being sought and the issues in the proceeding to which the opinion relates;

5. your opinion respecting those issues; your reasons for your opinion, including:

   (a) a description of the factual assumptions on which your opinion is based,

   (b) a description of any research conducted by you that led you to form your opinion, and a list of every document, if any, relied on by you in forming your opinion.

In your report, please also certify that you:

- are aware of your duty to assist the Court;
- are not an advocate for any party to me;
- have prepared your report in conformity with your duty, and
- will, if called upon to give oral or written testimony, give that testimony in conformity with your duty.

Please be sure to retain all notes and file contents pertaining to the provision of your opinion, whether digital or written, and these should be made available for production to opposing counsel at or before the hearing.

Your opinion, and the reasons for your opinion, should be expressed in the simplest of terms, bearing in mind that the challenge an expert witness faces is to make their evidence easily understood.

Please ensure that your report contains the appropriate headings if necessary, page numbers and paragraph numbers for ease of reference to specific portions of your report. While it is preferred that your report be concise, if a lengthy report is required, please include an index for the report.

Thank you for your willingness to assist on such short notice. If you need anything further please advise.

Yours truly,

DOAK SHIRREFF LAWYERS LLP

Per:

Lee C. Turner
(Professional Law Corporation)

LCT/lct

Exhibit B

Page 213 of the filed affidavit for Court File No. T-432-25 in Federal Court between Universal Ostrich Farms Inc. (Applicant) and Canadian Food Inspection Agency (Respondent) entitled:

"Rule 318 Certified Tribunal Record of the Canadian Food Inspection Agency" filed by Cortnie Fotheringham, Incident Commander, Western HPAI Response. Dated February 22, 2025. This corresponds to internal communications listed under Tab 6D as a January 4, 2024, e-mail from CFIA AI Lab Liaison to CFIA AI Commander re Ostrich sample results.

213

From:	West AI Lab Liaison / Ouest IA Liaison de laboratoire (CFIA/ACIA)
To:	West AI Commander / Ouest IA Commandant (CFIA/ACIA)
Subject:	Ostrich sample results
Sent:	1/4/2025 11:16:06 AM

Ostrich sample results from NCFAD, just in case you need this info over the weekend
Thanks
Nicki
WIN-AH-2025-FAV-0003
System ID#: 2025DCS-0000000033-4
Reason for submission: lab referral for confirmatory testing for HPAI, ref# 24-10316 (but being sent directly from the premise)
Owner: Universal Ostrich
Location: Edgewood
Submitter: Nicole Conner
Dist office: (2840) Vernon
Species: ostrich
Samples: 2 swabs
Test: AIV-PCRMX
History: Ostrich farm. Tested positive at BCMAL, duplicate samples being sent from the Vernon District office Michelle Li will be sending out the other set of samples from AHL on Monday with other positives as she is worried about the issues we have been having with shipping.
NCFAD Results 2025-01-03:
AVIN-PCRMX: Nucleic acid was extracted from the 2 swab samples and tested for the presence of influenza A genomic material using the matrix, H5 and H7 gene-based real-time RT-PCR assays. 2/2 swab samples tested **positive** on the matrix and on the **H5 gene-**based real-time RT-PCR assays, 2/2 samples were **negative on the H7** real-time RT-PCR assay. 2/2 swab samples tested **positive on the clade-specific** H5 2.3.4.4 real-time RT-PCR assay.
NCFAD Results 2025-01-04
Molecular pathotyping: The entire genome of the virus was amplified from two original swab samples and submitted to our Genomics group for NANOPORE sequencing. Eight gene segments of the virus were sequenced. The HA of the virus from the samples belong to **Eurasian Gs/GD lineage HPAI H5N1 (2.3.4.4B)** with cleavage site motif of **"PLREKRRKR/GLF"** compatible with HPAI viruses that came to Canada via the **Pacific flyway**. The H5N1 virus is a reassortant virus with **PB2, PA, and NP** originated from North American lineage low pathogenic avian influenza virus, and **PB1, HA, NA, M and NS gene segments from Eurasian viruses.** The virus is similar to the D1.1 viruses circulating in North America, but has the neuraminidase segment identical to WIN-AH-2022-OTH-0033 virus. PB2 – 627E (avian).

THE UNIVERSITY OF BRITISH COLUMBIA

Dr. Steven Pelech
8755 Ash Street, Suite 1
Vancouver, B.C., Canada V6P 6T3
Tel: 604-323-2547 ext. 10 Fax: 604-323-2548
spelech@mail.ubc.ca

Date: 10 September 2025

Re: Expert Report – Testing for H5N1 influenza antibodies in from ostrich eggs retrieved from Universal Ostrich Farms, Ltd. – Analysis of natural immunity and scientific merits of preservation of the Universal Ostrich Farms herd

For the case involving Universal Ostrich Farms Ltd. versus the Canada Food Inspection Agency represented by Mr. Umar Sheikh of Sheikh Law.

1. On December 31st, 2024, the Canadian Food Inspection Agency (CFIA) issued a cull order for all of the 399 ostriches residing at the Universal Ostrich Farm (UOF) remotely located in central British Columbia near Edgewood. This was based on positive PCR results from two dead birds tested for the H5 gene of influenza virus within 41 minutes of the agency's notification of the results from a local testing lab in BC. This was despite a lack of data that the influenza virus was positive for the N1 gene or that it was in fact a highly pathogenic avian influenza (HPAI) virus. Subsequent full genome sequencing confirmed that the recovered virus was a hybrid mix of high and low pathogenicity H5N1 virus.

2. By January 15, 2025, there was no further evidence of sickness from HPAI in the UOF flock. More than 8 months later, the ostriches have remained healthy and disease free. However, the CFIA has remained committed to the extermination of the ostriches despite a large public outcry and even the requests of the US Administration for Health and Human Services (HHS) to preserve these birds due to their scientific value.

3. While the ostriches presently offer no threat to each other, wild birds, other animals and people, the CFAI has maintained in court proceedings with their experts that the ostriches may be still be asymptomatic and shedding active virus. Yet, the CFIA has forbidden testing of the ostriches to test this highly unlikely

hypothesis. Moreover, the agency has expressed concerns that the soil of the UOF may also contain active virus that could infect other wild birds even a year later. Interestingly, despite the roosting and fouling of hundreds of school yards and parks in BC by hundreds of thousands of wild migratory ducks and geese infected with HPAI, there have been no government warnings about the risk of H5N1 influenza to humans and pets from their excrement in the past few years.

4. Over the last 4 years, there has been 533 outbreaks of avian influenza mainly at commercial poultry operations. Imposition of the stamping-out policy by CFIA has resulted in the destruction of at least 14.4 million domestic fowl on farms in Canada. The claim has also been made by the CFIA that this policy remains the only viable strategy to control the spread of the highly pathogenic avian influenza virus. This is despite the option that the World Organization for Animal Health (WOAH) allows for regaining of "disease-free" status after one year for a zone if an HPAI infection is allowed to "burn-out" instead of being stamped-out. The UOF is located in its own zone, so the outbreak at this farm has not materially affected the poultry industry international trade for other farms in BC or elsewhere in Canada.

5. The CFIA has maintained that their actions are to safeguard the health of Canadians and preserve the poultry industry in Canada by preventing the spread of HPAI. Evidence of the effectiveness of the stamping-out policy, which has resulted in financial hardship and closure for many smaller poultry farms, is questionable, especially in view of its wide-spread distribution in wild birds and other animals in North and South America.

6. The CFAI has admitted on their website that "*there is no evidence to suggest that eating cooked poultry or eggs could transmit the virus to humans."* In fact, with the current HPAI pandemic that started in 2021, there has only been one H5N1 case in a person in Canada, which was a 13-year-old BC girl that recovered. There have been about 70 cases of H5N1 in the US during this time with only one fatality in a 65-year-old male with comorbidities. Most US cases were mild, and arose in dairy rather than poultry farm workers. The lethality rate of the recent H5N1 influenza cases in North America can be calculated to be less than 1.4%, since we do not really know how many people actually have become infected with the H5N1 virus. This is very different from the suggestion by CFIA experts that the case fatality rate may be closer to 50%.

7. In a twist of irony, the main business activity of the UOF is the production of antibodies against infectious diseases and other health by-products found in the eggs from the ostriches. The UOF had been engaged in research into the creation of antibodies against the spike protein of the SARS-CoV-2 virus, which is

responsible for COVID-19. All of the COVID-19 vaccines on the market have targeted the spike protein. What makes ostriches ideal for industrial scale antibody production is that the yolk of their large eggs is rich in a type of antibody that is uniquely highly stable to almost boiling and very acidic and basic conditions.

8. Ostriches can live up to 75 years, and each female can produce 30 or more eggs in a season. Most of the ostriches at the UOF are more than 20 years-old and could lay eggs for up to 55 years. However, it can take up a few years before an ostrich is comfortable around its handlers, and these prehistoric creatures are well-equipped with clawed toes to take on even lions in wild. Ostriches are the largest and heaviest of the bird species, with weights that can exceed 150 kilograms.

9. The typical purchase price of a full-grown ostrich is over $6,000, but if the antibodies produced in an egg are against an important target protein in research, the purified antibodies recovered from a single egg could fetch tens of thousands of dollars in the research reagent market.

10. With almost anything the ostriches are immunized with, such as proteins from an infectious pathogen, they will produce antibodies in their blood and eggs that specifically target the virus, bacteria or fungi. Such antibodies are valuable for research purposes, for development of diagnostics such as rapid antigen tests, and even therapeutic antibodies to treat an infection.

11. Recently, the provincial ministry of agriculture in BC has created a 2.5 million dollar fund for Fraser Valley poultry farms to install air filters and uv lights to protect their birds from HPAI. One of the applications that was being studied with a UOF research collaborator from Kyoto Prefectural University in Japan was the development of anti-spike antibody-coated air filters and masks that could capture the SARS-CoV-2 virus and detect the presence of the pathogen. With the recovery of the UOF ostriches from H5N1 influenza virus, these birds and their eggs are likely to be replete with antibodies against the virus, which could be used to coat air filters and masks to protect the commercial bird flocks and their handlers. Testing of UOF ostrich egg yolks recovered in the summer of 2024 has confirmed that the ostriches possessed antibodies, likely from previous exposures to H5N1 influenza viruses.

12. Due to the overzealous application of the stamping-out policy in Canada and other countries, there are very few flocks of birds in a controlled environment where the effectiveness and duration of naturally acquired immunity to the H5N1 virus can be studied. At least 85% of the ostriches survived the last

outbreak of H5N1 infection on the UOF site, so the remaining birds clearly have natural immunity, a fact acknowledged by the CFIA. Robert Kennedy, Jr., the Director of the US HHS has reached out a few times to the Canadian Government requesting that these valuable birds be saved for their scientific importance.

13. I have previously provided three expert reports to the Federal Court of Canada, dated January 29, 2025, February 13, 2025, and April 1, 2025 in response to questions that were put to me by the firms of Cleveland & Doan Barristers & Solicitors and Doak Shirreff Lawyers LLP related to the flock of ostriches (Herd) located at the Universal Ostrich Farms Ltd. (UOF) near Edgewood, B.C. and the risks of transmission of the H5N1 strain of influenza, which was responsible for the last waves of avian flu. In those reports, I outlined my scientific expertise and training, and provided my assessment of the risks that these ostriches posed, including a critique of the arguments presented by the Canada Food Inspection Agency (CFIA) that these birds must be culled in accordance with their stamping out policy to prevent the spread of highly pathogenic avian influenza (HPAI).

14. In this report, I am providing results from my own testing through my company Kinexus Bioinformatics Corporation (Vancouver, B.C.) for antibodies against the H5 hemagglutinin and N1 neuraminidase influenza viral proteins present in the yolks of 18 ostrich eggs produced at the UOF site in the summer of 2024. The detection of antibodies against the said proteins is a strong indicator of the ostriches' previous state of natural immunity against the avian H5N1 virus prior to the last outbreak of influenza at the UOF site in December 2024 and January 2025.

15. The positive detection of H5- and N1-specific antibodies in the summer of 2024 indicates that the UOF Herd was previously exposed to H5N1 virus and had developed immunity against the virus. This means that the ostriches were to a highly significant extent protected by their immune systems against a virus that normally produces an 85% or greater fatality rate in birds, which would qualify the virus as highly pathogenic avian influenza. This is in part why the UOF Herd only experienced a 15% fatality rate during the last influenza outbreak, which concluded

nearly 9 months ago, and the birds have been healthy and apparently disease free since then. Other evidence provided by the CFIA has also indicated that the detected virus was actually a hybrid of high and low pathogenicity influenza virus strains.

16. During the COVID-19 pandemic, Kinexus Bioinformatics Corporation previously developed serological tests for determining in blood samples the levels of antibodies against the SARS-CoV-2 virus for a clinical study that involved the testing of 4,500 participants. In short, about 6,000 short peptide fragments derived from the predicted amino acid sequences of 28 SARS-CoV-2 proteins were tested in SPOT peptide arrays for their ability to bind antibodies that were present in individuals that got COVID-19 as confirmed by symptoms and positive PCR tests for the virus. These clinical studies revealed that about 90% of the tested participants had multiple antibodies that recognized SARS-CoV-2 virus-derived peptides, that their patterns of which viral peptides that the participants made antibodies varied markedly, and that these patterns were stable for at least two years.

17. With the situation of the apparent outbreak of avian influenza on the UOF site and the evident establishment of herd immunity by January 15, 2025, there was a valuable opportunity to see if the SPOT methodology could be applied to identifying those parts of the H5N1 virus that were immunogenic (*i.e.,* evoke a strong antibody response) and could be diagnostic for specific prior infection with the H5N1 virus and not other strains of influenza viruses. However, the prohibitive order from the CFIA prevented the UOF from sending me recent samples from the quarantined ostriches for antibody testing.

18. However, the UOF had frozen samples of egg yolks that had been collected from their ostriches in the summer of 2024, which pre-dated the recent infection of the herd in December 2024 and January 2025, and which were stored off-site, outside of the quarantine zone. I reasoned that if the ostriches had a prior exposure to H5N1 virus, then these yolk samples should have evidence of antibodies that recognize and bind to peptides patterned after parts of the H5 hemagglutinin and N1 neuraminidase proteins. Such peptides should be unique in their amino acid sequences from the hemagglutinin and neuraminidase proteins found in other influenza strains known to infect birds.

19. Figures 1 and 2 show the complete amino acid sequences of hemagglutinin and neuraminidase proteins found in H5N1 and other avian influenza viruses. Those regions that were the most unique to the H5 and N1 proteins are highlighted in yellow on the figures. Based on these unique sequences, 74 peptides were synthesized on cellulose membranes as individual spots on the arrays.

20. These H5N1-specific peptide SPOT arrays were then used for testing. Briefly, the frozen egg yolks were thawed and diluted with a phosphate-buffered saline solution and then incubated with the SPOT arrays for 2 hours. Subsequently, the arrays were washed repeatedly to remove any unbound antibodies from the cellulose membrane. The presence of captured antibodies on the arrays was detected with a horse radish peroxidase (HRP)-coupled secondary antibody that recognizes the constant region of chicken IgY antibodies. Enhanced chemiluminescence (ECL) detection based on the appearance of product from the HRP-couple reaction permits the production of a dark spot on the SPOT array after scanning it with a Bio-Rad FluroS-Max imager. The darker the peptide spot on the array image, the higher the level of IgY antibody that specifically recognizes that peptide amino acid sequence from the virus.

Figure 1. Alignment of the H5, H4, H7, H9 and H10 hemagglutinin proteins of chicken influenza strains. Amino acid sequences were obtain from Uniprot (www.uniprot.org) and aligned using the CLUSTAL O(1.2.4) multiple sequence alignment program available at the Uniprot website. Perfect matches (*i.e.,* identity) with the amino acid type and position are shown with an asterisk; similar amino acid types in the same position (*i.e.,* similarity) are shown with a colon (high similarity) or semi-colon (low similarity). The regions encompassing the peptides used in the Kinexus anti-H5N1 antibody test for the hemagglutinin are highlighted in yellow. These were the most distinct regions in the H5 HA protein from the other influenza variants.

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sp|P09345|HEMA_I59A0     H5  ME--RIVLLLA----IVSLVKSDQICIGYHANKSTKQVDTIMEKNVTVTHAQDILERTHN   54
tr|Q4ZJF4|Q4ZJF4_9INFA  H9  MEAVSLITILL----VVTVSNADKICIGYQSTNSTETVDTLTENNVPVTHAKELLHTEHN   56
sp|P19695|HEMA_I75A4     H4  MLSITILFLLIAEGSSQNYTGNPVICLGHHAVSNGTMVKTLTDDQVEVVTAQELVESQHL   60
sp|P12581|HEMA_I49A0     H10 MYKVVVIIALL-----GAVRGLDKICLGHHAVANGTIVKTLTNVQEEVTNATETVESTSL   55
sp|P09343|HEMA_I85A3     H7  MNTQILILTLV----AAIHTNADKICLGHHAVSNGTKVNTLTERGVEVVNATETVERRTI   56
                             *    ::  *             **:*:::  .   *.*: :    *. * : :.

sp|P09345|HEMA_I59A0     H5  GKLCSLNGVKPLILRDCSVAGWLLGNPMCDEFLNVPEWSYIVEKDNPINSLCYPGDFNDY   114
tr|Q4ZJF4|Q4ZJF4_9INFA  H9  GMLCATNLGHPLILDTCTIEGLIYGNPSCNLLLGGREWSYIVERPSAVNGLCYPGNVENL   116
sp|P19695|HEMA_I75A4     H4  PELCPS-PLRLVDGQTCDIVNGALGSPGCNHLNG-AEWDVFIERPTAV-DTCYPFDVPDY   117
sp|P12581|HEMA_I49A0     H10 NRLCMK-GRSYKDLGNCHPIGMLIGTPACDLHLT-GTWDTLIERKNAI-AYCYPGTTINE   112
sp|P09343|HEMA_I85A3     H7  PRICTK-GKKAIDLGQCGLLGIITGPPQCDQFLE-FTADLIIERREGN-DVCYPGKFVNE   113
                               :*           *   .   * * *:        . ::*:       ***    :
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sp|P09345|HEMA_I59A0    H5  EELKHLLSSTNHFEKIQIIPRSSWSNHDASSGVSSACPYIGRSSFFRNVVWLIKK--DNA  172
tr|Q4ZJF4|Q4ZJF4_9INFA  H9  EELRSLFSSASSYQSIQIFPDTIWNVSY--SGTSKAC----SDSFYGSMRWLAQK--NNA  168
sp|P19695|HEMA_I75A4    H4  QSLRSILANNGKFEFI--VEKFQWNT-VKQNGKSGACKRANENDFFTNLNWLTKS-DGNA  173
sp|P12581|HEMA_I49A0    H10 GALRQKIMESGGISKT--STGFAYGSSINSAGTTKACMRNGGDSFYAEVKWLVSKDKGQN  170
sp|P09343|HEMA_I85A3    H7  EALRQILRESGGINKE--TTGFTYSG-IRTNGVTSACRR-LGSSFYAEMKWLLSNTDNAA  169
                              *:  : . .  .         :.      * : **     ..*: .: ** ..  .

sp|P09345|HEMA_I59A0    H5  YPTIKRSYNNTNQEDLLILWGIHHPNDAAEQTKLYQNPTTYVSVGTSTLNQRSIPEIATR  232
tr|Q4ZJF4|Q4ZJF4_9INFA  H9  YPIQDAQYTNNRGKNIPFMWGINHPPTDTVQTNLYTRTDTTTSVATEDINRTFKPLIGPR  228
sp|P19695|HEMA_I75A4    H4  YPLQNLTKVNNGDYARLYIWGVHHPSTDTEQTNLYENNPGRVTVSTKTSQTSVVPNIGSR  233
sp|P12581|HEMA_I49A0    H10 FPQTTNTYRNTDTAEHLIIWGIHHPSSTQEKNDLYGTQSLSISVGSSTYQNNFVPVVRAR  230
sp|P09343|HEMA_I85A3    H7  FPQMTKSYKNTRNEPALIVWGIHHSGSATEQTKLYGSGNKLITVGSSNYQQSFVPSPGAR  229
                            :*       *.       :**::*      :..**       :*.:.  :    *    *

sp|P09345|HEMA_I59A0    H5  PKVNGQSGRMEFFWTILKPNDAINFESNGNFIAPEYAYKIVKKGDSAIMKSGLAYGNCDT  292
tr|Q4ZJF4|Q4ZJF4_9INFA  H9  PLVNGQQGRIDYYWSVLKPGQTLRVRSNGNLTAPWYGHILSGESHGRILKTDLNSGNCVV  288
sp|P19695|HEMA_I75A4    H4  PWVRGQSGRISFYWTIVEPGDIIVFNTIGNLIAPRGHYKLNSQKKSTILNTAVPIGSCVS  293
sp|P12581|HEMA_I49A0    H10 PQVNGQSGRIDFHWTLVQPGDNITFSHNGGRIAPSRVSKLVGRGL-GIQSEASIDNGCES  289
sp|P09343|HEMA_I85A3    H7  PQVNGQSGRIDFHWLILNPNDTVTFSFNGAFVAPDRVSFFKGKSM-GIQSEVPVDTNCEG  288
                            * *.**.**:.:.* :::*.: : .   *   **     :  .    * .      .*

sp|P09345|HEMA_I59A0    H5  KCQTPVGAINSSMPFHNIHPHTIGECPKYVKSDRLVLATGLRNVPQR----KKRGLFGAI  348
tr|Q4ZJF4|Q4ZJF4_9INFA  H9  QCQTERGGLNTTLPFHNVSKYAFGNCPKYVGVKSLKLAVGLRNVPAR----SSRGLFGAI  344
sp|P19695|HEMA_I75A4    H4  KCHTDRGSITTTKPFQNISRISIGDCPKYVKQGSLKLATGMRNIPEK----ATRGLFGAI  349
sp|P12581|HEMA_I49A0    H10 KCFWRGGSINTKLPFQNLSPRTVGQCPKYVNKKSLMLATGMRNVPEIM---QGRGLFGAI  346
sp|P09343|HEMA_I85A3    H7  ECYHNGGTITSNLPFQNVNSRAVGKCPRYVKQKSLLLATGMKNVPEIPKKREKRGLFGAI  348
                            :*    * :.:. **:*:   :.*.**:**    * **.*::*:*        *******

sp|P09345|HEMA_I59A0    H5  AGFIEGGWQGMVDGWYGYHHSNEQGSGYAADKESTQKAIDGITNKVNSIIDKMNTQFKAV  408
tr|Q4ZJF4|Q4ZJF4_9INFA  H9  AGFIEGGWSGLVAGWYGFQHSNDQGVGMAADRDSTQKAIDKITSKVNNIVDKMNKQYEII  404
sp|P19695|HEMA_I75A4    H4  AGFIENGWQGLIDGWYGFRHQNAEGTGTAADLKSTQAAIDQINGKLNRLIEKTNEKYHQI  409
sp|P12581|HEMA_I49A0    H10 AGFIENGWEGMVDGWYGFRHQNAQGTGQAADYKSTQAAIDQITGKLNRLIEKTNTEFESI  406
sp|P09343|HEMA_I85A3    H7  AGFIENGWEGLVDGWYGFRHQNAQGEGTAADYKSTQSAIDQITGKLNRLIEKTNQQFELI  408
                            *****.**.*:: ****::*.* :* * *** .*** *** *..*:* :::* * ::. :

sp|P09345|HEMA_I59A0    H5  GKEFNNLERRVENLNKKMEDGFLDVWTYNVELLVLMENERTLDFHDSNVKNLYDKVRLQL  468
tr|Q4ZJF4|Q4ZJF4_9INFA  H9  DHEFSEVETRLNMINDKIDDQIQDIWAYNAELLVLLENQKPLDEHDANVNNLYNKVKRTL  464
sp|P19695|HEMA_I75A4    H4  EKEFEQVEGRIQDLEKYVEDTKIDLWSYNAELLVALENQHTIDVTDSEMDKLFERVRRQL  469
sp|P12581|HEMA_I49A0    H10 ESEFSEIEHQIGNVINWTKDSITDIWTYQAELLVAMENQHTIDMADSEMLNLYERVRKQL  466
sp|P09343|HEMA_I85A3    H7  DNEFTEVEKQIGNVINWTRDSITEVWSYNADLLVAMENQHTIDLADSEMNKLYERVRRQL  468
                              ** ::* ::  : .   *   ::*:*:.:*** :**:: :*  *::: :*:::*:  *

sp|P09345|HEMA_I59A0    H5  KDNARELGNGCFEFYHKCDNECMESVRNGTYDYPQYSEEARLNREEISGVKLESMGVYQI  528
tr|Q4ZJF4|Q4ZJF4_9INFA  H9  GSNAVEDGKGCFELYHKCDDQCMETIRNGTYNRRKYKEESRLERQKIEGVKLESEGTYKI  524
sp|P19695|HEMA_I75A4    H4  RENAEDKGNGCFEIFHQCDNNCIESIRNGTYDHDIYRDEAINNRFQIQGVKLTQ-GYKDI  528
sp|P12581|HEMA_I49A0    H10 RQNAEEDGKGCFEIYHTCDDSCMESIRNNTYDHSQYREEALLNRLNINSVKLSS-GYKDI  525
sp|P09343|HEMA_I85A3    H7  RENAEEDCTGCFEIFHKCDDDCMASIRNNTYDHSTYREEAMQNRVKIDPVKLSS-GYKDV  527
                             .** :  .****::* **:.*: ::**.**:   * :*:  :* :*. *** . *  .:

sp|P09345|HEMA_I59A0    H5  LSIYSTVASSLALAIMIAGLSFWMCSNGSLQCRICI  564
tr|Q4ZJF4|Q4ZJF4_9INFA  H9  LTIYSTVASSLVIAMGFAAFLFWAMSNGSCRCNICI  560
sp|P19695|HEMA_I75A4    H4  ILWISFSISCFLLVALLLAFILWACQNGNIRCQICI  564
sp|P12581|HEMA_I49A0    H10 ILWFSFGASCFVLLAAVMGLVFFCLKNGNMQCTICI  561
sp|P09343|HEMA_I85A3    H7  ILWFSLGASCFLLLAIAMGLVFMCVKNGNMRCTICI  563
                            :   *   *.: :     .: :   .**. :* ***
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Figure 2. Alignment of the N1, N2, N3, N6, N7, N8 and N9 neuraminidase proteins of chicken influenza strains. Amino acid sequences were obtain from Uniprot (www.uniprot.org) and aligned using the CLUSTAL O(1.2.4) multiple sequence alignment program available at the Uniprot website. Perfect matches (*i.e.,* identity) with the amino acid type and position are shown

with an asterisk; similar amino acid types in the same position (*i.e.,* similarity) are shown with a colon (high similarity) or semi-colon (low similarity). The regions encompassing the peptides used in the Kinexus anti-H5N1 antibody test for the neuraminidase are highlighted in yellow.

```
sp|Q809V2|NRAM_I01A2          N1  MNPNQKIITIGSICMVIGIVSLMLQIGNIISIWVSHSIQTGNQHQA---------EPCNQ  51
tr|D1LM97|D1LM97_9INFA        N8  MNPNLKIITIGSVSLGLVVLNILLHIVSIT---ITVLVLPGD-GNN---------GSCNE  47
sp|P18881|NRAM_I000F          N7  MNPNQKLFALSGVAIALSVLNLLIGISNVGLNVSLHLKGEGVKQENNLTCTTITQ--NNT  58
tr|A0A0C4K198|A0A0C4K198_9INFA N9  MNPNQKILCTSATAIIIGAIAVLIGIANLGLNIGLHLKPGCNCSHSQPET---TN--TSQ  55
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA N6  MNPNQKITCISATGMTLSVVSLLIGIANLGLNIGLHYKVSDSTTINIPNM---NE--T--  53
tr|A6M7W4|A6M7W4_9INFA        N3  MNPNQKIITLGVVNTTLSTIALIIGVGNLIFNTVIHEKIGDHQTVVYPTVTPPGTPNCSD  60
sp|P09573|NRAM_I83A6          N2  MNPNQKIITIGSVSLTIATVCFLMQIAILATNVTLHFRQNERSIPAYNQTTP-----CKP  55
                                  **** *:   .     :  : .:: :  :

sp|Q809V2|NRAM_I01A2          N1  SIITYENNTWVNQTYVNISNTNL---LTEKAVASVTLAGNSSLCPISGWAVYSKDNGIRI  108
tr|D1LM97|D1LM97_9INFA        N8  TVIREYNETVRIEKITQWHNTNIIE-YIEKPESDLFMNNTEPLCDAKGFAPFSKDNGIRI  106
sp|P18881|NRAM_I000F          N7  TVVENTY----------VNNTTIINKG-TNLKAPNYLLLNKSLCSVEGWVVIAKDNAIRF  107
tr|A0A0C4K198|A0A0C4K198_9INFA N9  TII-NNY----------YNETNITNIQMEERTSRNFNNLTKGLCTINSWHIYGKDNAVRI  104
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA N6  ------N----------PTTTNITNIIVNKNEERTFLNLTKPLCEVNSWHILSKDNAIRI  97
tr|A6M7W4|A6M7W4_9INFA        N3  TIITYNN----------TVVNNITTTII--AEAEKHFKPSLPLCPFRGFFPFHKDNAIRL  108
sp|P09573|NRAM_I83A6          N2  I-------------------------II--ERNIKYRNWSKPQCQITGFAPFSKDNSIRL  88
                                                              .   *   .:    ***.:*:

sp|Q809V2|NRAM_I01A2          N1  GSKGDVFVIREPFISCSHLECRTFFLTQGALLNDKHSNGTVKDRSPYRTLMSCPVGEAPS  168
tr|D1LM97|D1LM97_9INFA        N8  GSRGHVFVIREPFVSCSPTECRTFFLTQGSLLNDKHSNGTVKDRSPYRTLMSVGIGQSPN  166
sp|P18881|NRAM_I000F          N7  GESEQIIVTREPYVSCDPSGCKMYALHQGTTIRNKHSNGTIHDRTTFRGLISTPLGTPPT  167
tr|A0A0C4K198|A0A0C4K198_9INFA N9  GESSDVLVTREPYVSCDPDECRFYALSQGTTIRGKHSNGTIHDRSQYRALISWPLSSPPT  164
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA N6  GEDAHILVTREPYLSCDPQGCRMFALSQGTTLRGRHANGTIHDRSPFRALISWEMGQAPS  157
tr|A6M7W4|A6M7W4_9INFA        N3  GENKDVIVTREPYVSCDNDGCWSFALAQGALLGTKHSNGTIKDRTPYRSLIRFPIGTAPV  168
sp|P09573|NRAM_I83A6          N2  SAGGGIWVTREPYVSCDPSKCYQFALGQGTTLDNNHSNGTIHDRTPHRTLLMNELGVPFH  148
                                  .    : * ***::**.   *  : * **: :  .*:***::**: .* *:   :.

sp|Q809V2|NRAM_I01A2          N1  PYNSRFESVAWSASACHDGTSWLTIGISGPDNGAVAVLKYNGIITDTIKSWRNNILRTQE  228
tr|D1LM97|D1LM97_9INFA        N8  VYQARFEAVAWSATACHDGKKWMTIGVTGPDAKAVAVVHYGGIPTDVINSWAGDILRTQE  226
sp|P18881|NRAM_I000F          N7  VSNSDFICVGWSSTSCHDGVGRMTICIQGNNDNATATVYYNRRLTTTIKTWAKNILRTQE  227
tr|A0A0C4K198|A0A0C4K198_9INFA N9  VYNSRVECIGWSSTSCHDGKSRMSICISGPNNNASAVVWYNRRPVAEINTWAQNILRTQE  224
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA N6  PYNTRVECIGWSSTSCHDGISRMSICISGPNNNASAVVWYRGRPVTEIPSWVGNILRTQE  217
tr|A6M7W4|A6M7W4_9INFA        N3  LGNYKEICVAWSSSSCFDGKEWMHVCMTGNDNDASAQIIYAGKMTDSIKSWRRDILRTQE  228
sp|P09573|NRAM_I83A6          N2  LG-TRQVCIAWSSSSCHDGKAWLHVCVTGDDRNATASFIYNGMLVDSIGSWSQNILRTQE  207
                                        .:.**:::*.**   : : : * :  * * . *    .  * :*  :******

sp|Q809V2|NRAM_I01A2          N1  SECACVNGSCFTVMTDGPSNGQASYKIFKIEKGKVVKSVELN-APNYHYEECSCYPDAGE  287
tr|D1LM97|D1LM97_9INFA        N8  SSCTCIQGECYWVMTDGPANRQAQYRAFKAKQGKIIGQTEIS-FNGGHIEECSCYPNEGK  285
sp|P18881|NRAM_I000F          N7  SECVCYNGTCAVVMTDGPASSQAYTKIMYFHKGLIIKEEPLR-GSARHIEECSCYGHDQK  286
tr|A0A0C4K198|A0A0C4K198_9INFA N9  SECVCHNGVCPVVFTDGSATGPADTRIYYFKEGKILKWESLT-GTAKHIEECSCYGERTG  283
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA N6  SECVCHKGICPVVMTDGPANNKAATKIIYFKEGKIQKIEELQ-GNAQHIEECSCYGAAGM  276
tr|A6M7W4|A6M7W4_9INFA        N3  SECQCIDGTCVVAVTDGPAANSADHRVYWIREGRVIKYENVPKTKIQHLEECSCYVDI-D  287
sp|P09573|NRAM_I83A6          N2  SECVCINGTCTVVMTDGSASGKADIRILFIREGKIVHISPLS-GSAQHIEECSCYPRYPN  266
                                  *.* * .* *  ..*** :   *  :    .:* :     :      * ******

sp|Q809V2|NRAM_I01A2          N1  ITCVCRDNWHGSNRPWVSFNQN-LEYQIGYICSGVFGDNPRPNDG--TGSCGPVSPN--G  342
tr|D1LM97|D1LM97_9INFA        N8  VECVCRDNWTGTNRPVLVISSD-LSYRVGYLCAGLPSDTPRGEDNQFTGSCTSPMGN--Q  342
sp|P18881|NRAM_I000F          N7  VSCVCRDNWQGANRPIIEIDMSTLEHTSRCVCTGVLTDTSRPGDKP-NGDCSNPITGSPG  345
tr|A0A0C4K198|A0A0C4K198_9INFA N9  ITCTCRDNWQGSNRPVIQIDPVAMTHTSQYICSPVLTDNPRPNDPN-IGKCNDPYPGN-N  341
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA N6  IKCVCRDNWKGANRPIITIDPEMMTHTSKYLCSKILTDTSRPNDPT-NGNCDAPITGGSP  335
tr|A6M7W4|A6M7W4_9INFA        N3  VYCVCRDNWKGSNRPWMRINNE-TILETGYVCSKFHSDTPRPADPS-TVSCDSPSNVN-G  344
sp|P09573|NRAM_I83A6          N2  VRCVCRDNWKGSNRPVIDINMADYSIDSSYVCSGLVGDTPRNDDSSSSSNCRDPNNER-G  325
                                  : *.***** *:*** : :.          :*: .  *. *  *     .*
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sp|Q809V2|NRAM_I01A2            N1   AYGIKGFSFKYGNGVWIGRTKSTNSRSGFEMIWDPNGWTG-TDSNFSVKQDIVAITDWSG   401
tr|D1LM97|D1LM97_9INFA          N8   GYGVKGFGFRQGNDVWMGRTISRTSRSGFEILRVRDGWIQ-NSKEQIKRQVVVDNLNWSG   401
sp|P18881|NRAM_I000F            N7   APGVKGFGFLNGDNTWLGRTISPRSRSGFEMLKIPNAETD-PNSRIIERQEIVDNSNWSG   404
tr|A0A0C4K198|A0A0C4K198_9INFA  N9   NNGVKGFSYLDGANTWLGRTISTASRSGYEMLKVPNALTD-DRSKPIQGQTIVLNADWSG   400
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA  N6   DPGVKGFAFLDGENSWLGRTISKDSRSGYEMLKVPNAETD-TQSGPTSYQLIVNNQNWSG   394
tr|A6M7W4|A6M7W4_9INFA          N3   GPGVKGFGFKTGDDVWLGRTVSISGRSGFEIIRVAEGWINSPNHAKSVTQTLVSNNDWSG   404
sp|P09573|NRAM_I83A6                 NPGVKGWAFDIGDDVWMGRTISKDSRSGYETFRVIGGWATANSKSQTNRQVIVDNNNWSG   385
                                       *:**:.:  * . *:*** *  .***:* :    .            * :*   :***

sp|Q809V2|NRAM_I01A2            N1   YSGSFVQHPELTGVDCIRPCFWVELIRGRPKES--TIWTSGSSISFCGVNSDTVGWSWPD   459
tr|D1LM97|D1LM97_9INFA          N8   YSGSFTLPVELTRRNCLVPCFWVEMIRGKPEEK--TMWTSSSSIVMCGVDHEIADWSWHD   459
sp|P18881|NRAM_I000F            N7   YSGSFIDCWD-EANECYNPCFYVELIRGRPEEAKYVWWTSNSLIALCGSPVSVGSGSFPD   463
tr|A0A0C4K198|A0A0C4K198_9INFA  N9   YSGSFMDYWA-E-GDCYRACFYVELIRGRPKEDK-VWWTSNSIVSMCSSTEFLGQWNWPD   457
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA  N6   YSGAFIDYWA-N-KECFNPCFYVELIRGRPKEID-VLWASNSMVALCGSRERLGSWSWHD   451
tr|A6M7W4|A6M7W4_9INFA          N3   YSGSFIV----ENNGCFQPCFYVELIRGRPNKNDDVSWTSNSIVTFCGLDNEPGSGNWPD   460
sp|P09573|NRAM_I83A6            N2   YSGIFSV----ESKSCINRCFYVELIRGRPQE-TRVWWTSNSIVVFCGTSGTYGTGSWPD   440
                                     *** *          *   **:**:***:*::   . *:*.* : :*.        .: *

sp|Q809V2|NRAM_I01A2            N1   GAELPFTIDK-  469
tr|D1LM97|D1LM97_9INFA          N8   GAILPFDIDKM  470
sp|P18881|NRAM_I000F            N7   GAQIQYFS---  471
tr|A0A0C4K198|A0A0C4K198_9INFA  N9   GAKIEYFL---  465
tr|A0A0K0YAR4|A0A0K0YAR4_9INFA  N6   GAEIIYFK---  459
tr|A6M7W4|A6M7W4_9INFA          N3   GSNIGFMPK--  469
sp|P09573|NRAM_I83A6            N2   GANINFMPL--  449
                                     *: : :
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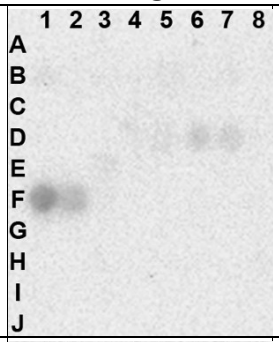
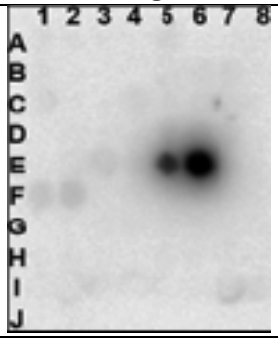
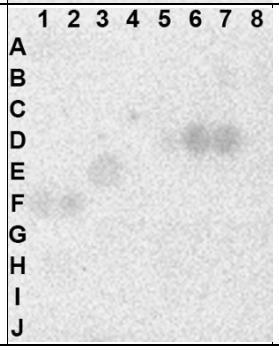
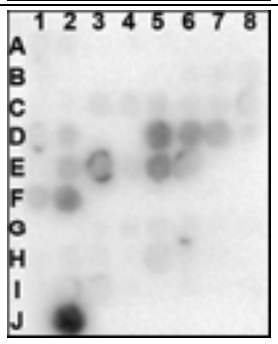
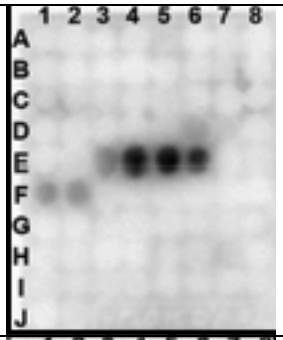
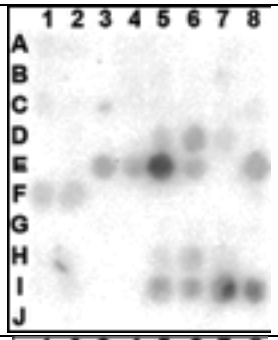
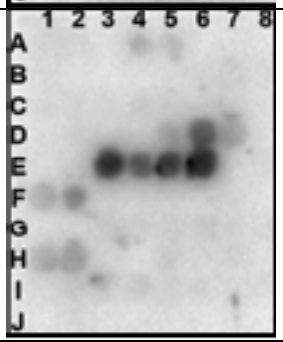
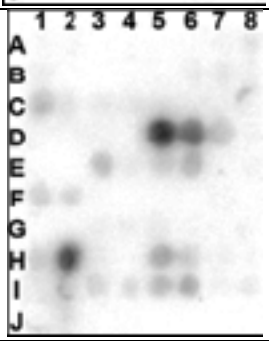
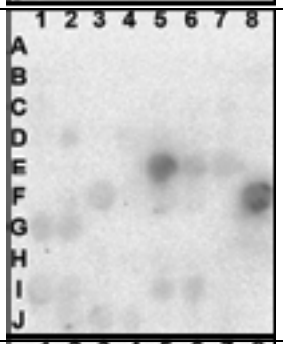
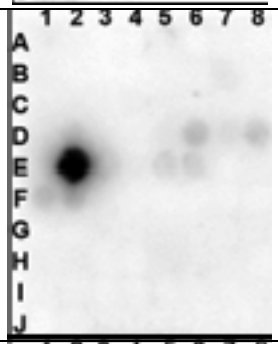
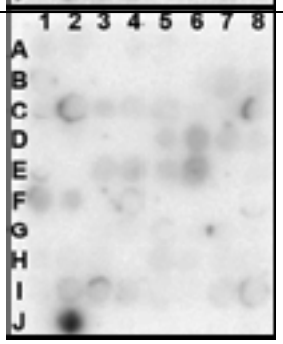
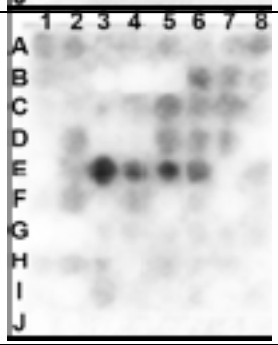
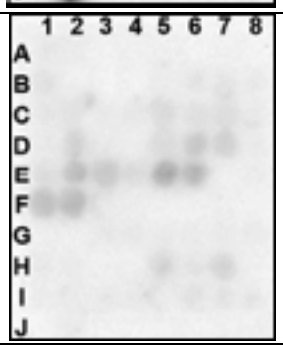
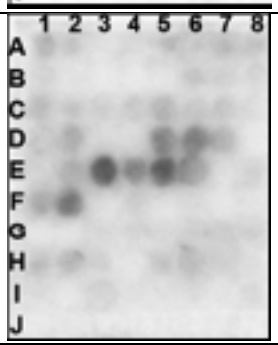
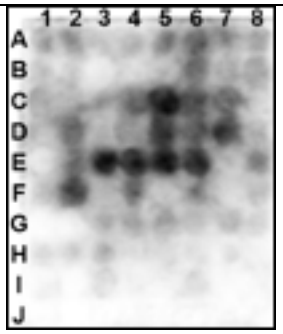
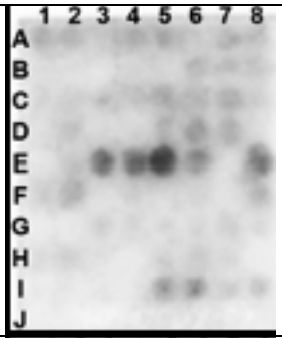
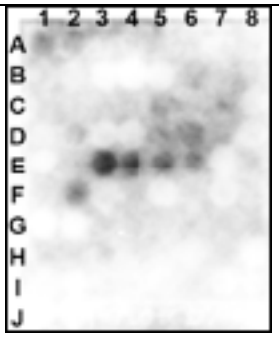
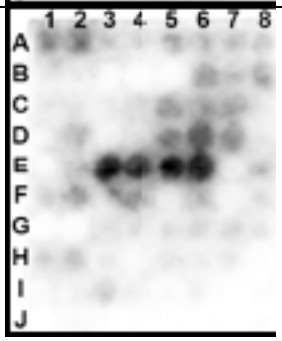
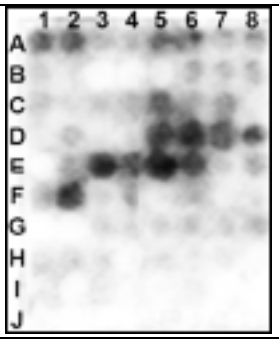
21. Figure 3 shows the raw testing results with the H5N1-specific SPOT array developed by Kinexus using egg yolk samples from 18 different UOF ostriches that were retrieved in the summer of 2024. These findings conclusively show that these ostriches possessed antibodies that could bind to multiple parts of the H5 and N1 proteins of the H5N1 avian influenza virus, which is strongly indicative of prior exposure to the virus, and can account why most of the birds did not succumb to the subsequent infection with H5N1 in December 2024 up to January 15, 2025, and none afterwards. As noted for the SARS-CoV-2 antibody response in humans, the patterns of antibody response to H5N1 appears to be unique in each ostrich.

22. It should be appreciated that the Kinexus H5N1 antibody test was specifically designed to distinguish previous H5N1 infections from other avian influenza virus infections. Many more peptide sequences of H5 and N1 could have been tested that would likely have cross-reacted with the hemagglutinin and neuraminidase proteins of these other influenza strains. This would have further demonstrated a high degree of immune protection against future influenza infections, which would include other mutated forms of H5N1.

Figure 3. H5N1 peptide SPOT arrays probed for IgY antibodies with ostrich egg yolk samples originally obtained in June, July and August of 2024. Testing was performed between January 31 and February 7, 2025. The appearance of a dark spot indicates positive immunoreactivity with a 14 amino acid long peptide derived from the H5 hemagglutinin protein (Spots A1 to E7) and N1 neuraminidase protein (Spots E8 to J2). In some cases, the peptides in adjacent spots shared 11 of the 14 amino acids. For example, Spot E3 (FEAVGREFNNLERR), Spot E4 (VGREFNNLERRIEN), Spot E5 (EFNNLERRIENLNK) and Spot (NLERRIENLNKKME), which were commonly immunogenic, encompassed a 23 amino acid stretch in the H5 hemaglutinin protein. The peptide in Spot I6 (TDSSFSVKQDIVAI) was the most commonly immunoreactive sequence from the N1 neuraminidase protein. The anti-chicken IgY secondary antibody weakly reacted directly with the peptides in Spots D6, D7, E3, F1 and F2, but none of the other peptides on the array.

Information	Image	Information	Image
KPL01CDY-01a T-TBS (neg. control) T-TBS (neg. control) – Background Control for anti-IgY antibody binding		KPL01CDY-05a H July 11, 2024 P5 H	
KPL01CDY-03b T-TBS (neg. control) T-TBS (neg. control) Background Control for anti-IgY antibody binding		KPL01CDY-06a P5 T2 D1 July 21, 2024 P5 T2 D1	

Information	Image	Information	Image
KPL01CDY-02a A July 5, 2024 P5 A		KPL01CDY-07a T July 14, 2024 P5 T	
KPL01CDY-03a A1 July 19, 2024 A1		KPL01CDY-08a T2 Aug 19, 2024 P4 T2	
KPL01CDY-04a B July 6, 2024 P5 B		KPL01CDY-09a P5 PRE ANTIBODY June 20, 2024 P5	
KPL01CDY-11a W2 Aug 5, 2024 P5 W2		KPL01CDY-05b L July 15 2024 P4 L	
KPL01CDY-12a R July 14, 2024 P5 R		KPL01CDY-06b N July 14, 2024 P4 N	

Information	Image	Information	Image
KPL01CDY-01b D July 9, 2024 P4 D		KPL01CDY-07b O July 13, 2024 P5 O	
KPL01CDY-02b P4 E July 9, 2024 P4 E		KPL01CDY-11b X July 17, 2024 P4 X	
KPL01CDY-04b J July 11, 2024 P4 J		KPL01CDY-12b Y July 18. 2024 P4 Y	

23. It should be appreciated that the Kinexus H5N1 antibody test was specifically designed to distinguish previous H5N1 infections from other avian influenza virus infections. Many more peptide sequences of H5 and N1 could have been tested that would likely have cross-reacted with the hemagglutinin and neuraminidase proteins of these other influenza strains. This would have further demonstrated a high degree of immune protection against future influenza infections, which would include other mutated forms of H5N1.

24. Without further exposure to a pathogen, the levels of antibodies against the pathogen will decline over time, but the B-cell that produce these antibodies still remain as plasma or memory B-cells. These B-cells will rapidly multiple and generate more antibodies as needed. Re-exposure

to the H5N1 virus at the end of last year and the beginning of 2025 likely boosted the levels of the anti-H5 and anti-N1 IgY levels to much higher than what was evident in our tests of the egg yolks from last summer.

25. Any future encounters of the Herd at the UOF site with wild birds infected with the H5N1 virus at this point is likely to permit natural boosting the anti-H5N1 antibody levels in the ostriches with causing them to be ill. Any requirements to prevent wild birds from frequenting the UOF site, for example by netting ponds, or restricting access to the bird feed, would appear to me to be unnecessary. Rather, it would be better for the wild birds to come to the UOF site than another site where the herd immunity against the H5N1 virus has not been established. Infected wild birds are highly unlikely to successfully transmit the H5N1 virus to the ostriches, and vice versa.

26. The CFIA should be seizing the opportunity to use the UOF site to obtain important information about the establishment, effectiveness and durability of protective herd immunity. The longevity and careful tracking of these valuable ostriches on an isolated farm as birds that have no flight risk make this an ideal location for further research.

27. It is evident from the continuous outbreaks of H5N1 on commercial chicken farms in Canada, and recently in cattle in the US, that the policy of testing, culling and compensation is not working with at least 533 outbreaks in Canada and no sign of this abating as long as migrating wild birds carry the H5N1 virus. It may be a few more years before herd immunity against H5N1 is firmly established in the wild bird populations. It is important to explore other strategies to mitigate the threat of the H5N1 virus, including the establishment of natural immunity in domestic birds to provide effective protection against future infection and transmission.

Respectfully submitted by,

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University of British Columbia

President and Chief Scientific Officer,
Kinexus Bioinformatics Corporation

Vice-President, and Co-Chair,
Scientific and Medical Advisory Committee
Canadian Citizens Care Alliance

Federal Court of Appeal | Cour d'appel fédérale

Date: 20250821

Docket: A-205-25

Citation: 2025 FCA 147

CORAM: **GLEASON J.A.**
LEBLANC J.A.
HECKMAN J.A.

BETWEEN:

UNIVERSAL OSTRICH FARMS INC.

Appellant

and

CANADIAN FOOD INSPECTION AGENCY

Respondent

Heard at Ottawa, Ontario, on July 15, 2025.

Judgment delivered at Ottawa, Ontario, on August 21, 2025.

REASONS FOR JUDGMENT OF THE COURT BY: THE COURT

Federal Court of Appeal | Cour d'appel fédérale

Date: 20250821

Docket: A-205-25

Citation: 2025 FCA 147

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Appellant

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CANADIAN FOOD INSPECTION AGENCY

Respondent

REASONS FOR JUDGMENT OF THE COURT

[1] The appellant, Universal Ostrich Farms Inc., appeals from the judgment of the Federal Court in *Universal Ostrich Farms Inc. v. Canada (Food Inspection Agency)*, 2025 FC 878 (*per* Zinn J.) [the *FC Decision*]. In that judgment, the Federal Court dismissed an application for judicial review of two related decisions of the respondent, the Canadian Food Inspection Agency (the CFIA).

[2] The first decision, a Notice to Dispose issued on December 31, 2024, required the appellant to dispose of all the ostriches on its farm by February 1, 2025, after laboratory testing confirmed infection of two dead ostriches with the H5N1 strain of highly pathogenic avian influenza (HPAI). The second decision, an Exemption Denial dated January 10, 2025, denied the appellant's request to exempt at least some of its ostrich flock from destruction. The two decisions were made under section 48 of the *Health of Animals Act*, S.C. 1990, c. 21 [the *Act*] and in accordance with the CFIA's Stamping-Out Policy, which was operationalized through the CFIA's Highly Pathogenic Avian Influenza 2022 Event Response Plan (the 2022 ERP).

[3] The appellant has not yet complied with the Notice to Dispose decision because the Federal Court stayed that decision, pending determination of the judicial review application in the Federal Court, and thereafter a single judge of this Court further stayed the decision pending disposition of this appeal in this Court: *Universal Ostrich Farms Inc. v. Canada (Food Inspection Agency)*, 2025 FCA 122 at paras. 2, 12.

[4] The appellant has also brought a motion to adduce fresh evidence before this Court.

[5] For the reasons that follow, we have concluded that both the motion to adduce fresh evidence and this appeal must be dismissed. In so concluding, we recognize that our decision might lead to the death of over 400 ostriches owned by the appellant, an outcome that would doubtless be very difficult, both financially and emotionally, for the appellant's principals. While we have considerable sympathy for them, the law we are bound to apply inevitably leads to the conclusion that this appeal must be dismissed.

[6] In this regard, it is not the role of this Court to set, vary, or grant exemptions from governmental policy. Rather, our sole role is to determine whether the decisions at issue in this appeal were reasonable in accordance with the deferential standard of review set out in the case law of the Supreme Court of Canada, this Court, and other Canadian courts. Because the Stamping-Out Policy, which underlies the two decisions, the Notice to Dispose, and the Exemption Denial, are all reasonable in accordance with that case law, we have unanimously concluded that this appeal cannot succeed.

I. Factual and Regulatory Background

[7] The Federal Court's reasons provide a thorough summary of the relevant factual and regulatory background. We accordingly review only those facts and details of the regulatory background necessary for the disposition of this appeal.

A. *Avian influenza and Canada's response*

[8] HPAI is a highly infectious disease caused by a virus that spreads through infected hosts. It continues to be of particular concern to Canadian and international authorities. While HPAI mostly affects wild birds, it does spread, through direct and indirect contact, to domestic birds and sometimes to mammals, including occasionally to humans*: FC Decision* at para. 16. Canada has experienced numerous HPAI outbreaks since 2004, including the current outbreak of the H5N1 strain of HPAI (HPAI caused by the H5N1 virus), which commenced in 2021: *FC*

Decision at paras. 21–23. HPAI viruses may persist in infected environments for months or even years*: FC Decision* at para. 16.

[9] The Minister has authority under the *Act* to manage diseases in animals. Central to this appeal is section 48 of the *Act*, which reads as follows:

Disposal of affected or contaminated animals and things	**Mesures de disposition**
48 (1) The Minister may dispose of an animal or thing, or require its owner or any person having the possession, care or control of it to dispose of it, where the animal or thing	**48 (1)** Le ministre peut prendre toute mesure de disposition, notamment de destruction, — ou ordonner à leur propriétaire, ou à la personne qui en a la possession, la responsabilité ou la charge des soins, de le faire — à l'égard des animaux ou choses qui :
(a) is, or is suspected of being, affected or contaminated by a disease or toxic substance;	**a)** soit sont contaminés par une maladie ou une substance toxique, ou soupçonnés de l'être;
(b) has been in contact with or in close proximity to another animal or thing that was, or is suspected of having been, affected or contaminated by a disease or toxic substance at the time of contact or close proximity; or	**b)** soit ont été en contact avec des animaux ou choses de la catégorie visée à l'alinéa a) ou se sont trouvés dans leur voisinage immédiat;
(c) is, or is suspected of being, a vector, the causative agent of a disease or a toxic substance.	**c)** soit sont des substances toxiques, des vecteurs ou des agents causant des maladies, ou sont soupçonnés d'en être.
Treatment	**Traitement**
(2) The Minister may treat any animal or thing described in subsection (1), or require its owner or the person having the possession, care or control of it to treat it or to have it treated, where the Minister considers that the treatment will be effective in eliminating or preventing the spread of the disease or toxic substance.	**(2)** Le ministre peut par ailleurs soumettre ces animaux ou choses à un traitement, ou ordonner à ces personnes de le faire ou d'y faire procéder, s'il estime que celui-ci sera efficace dans l'élimination de la maladie ou de la substance toxique ou la prévention de la propagation.
…	[…]

[10] Section 48 of the *Act* grants the Minister substantial discretion in deciding when disposal is required. The CFIA, as a delegate of the Minister, has exercised that discretion through its Stamping-Out Policy, which requires depopulation of animals that risk transmitting HPAI: *FC Decision* at para. 96. The CFIA first adopted that policy in 2004, and it is now operationalized through the 2022 ERP, which has been continuously updated by the CFIA since its adoption. The 2022 ERP sets out guidelines based on international standards and the CFIA's scientific knowledge: *FC Decision* at paras. 93–95.

[11] Due to the risks associated with HPAI, the CFIA determined that the only viable alternative when there is laboratory detection of HPAI infection is to stamp out the virus by culling all potentially exposed birds susceptible to infection. The Stamping-Out Policy also responds to Canada's international commitments, and failing to adhere to it would have important negative international trade ramifications for Canada because other nations might refuse to accept exports of some or all Canadian poultry, at least for a time: *FC Decision* at paras. 95, 98–100.

[12] The 2022 ERP is updated based on lessons learned from past outbreaks in Canada. This case was the first time the CFIA applied the 2022 ERP to an outbreak in ostriches. To be clear, however, the Stamping-Out Policy as conceived applies to any susceptible bird: *FC Decision* at para. 102. Ostriches are such a bird. HPAI is not as lethal in ostriches, especially older birds, as in other domesticated flocks, like chickens or turkeys, where most will die of an infection. However, according to the CFIA's evidence, infection in ostriches raises particular risks. Exposed and infected ostriches may show no clinical signs of disease but yet be shedding the

virus and act as a reservoir for the further spread of infection to people, livestock, and wildlife. Moreover, ostriches may contribute genetic mutations to avian influenza viruses that increase its adaptability to mammals.

[13] Under the 2022 ERP, the laboratory confirmation of the H5-subtype HPAI in infected premises triggers the application of the Stamping-Out Policy. The CFIA's inspectors are directed to issue a Notice to Dispose of all the susceptible animals in the same "epidemiological unit", a group of animals with the same likelihood of exposure to HPAI: *FC Decision* at paras. 96–97, 102–104. The 2022 ERP lays out protocols for the disposal of animals as well as for cleaning and disinfection of the premises after disposal. These may include a requirement to remove the soil and other contaminated materials and a period during which lands must remain fallow, with no animals on them: *FC Decision* at para. 104.

[14] The CFIA, through a specialized Exemption Committee, exercises some case-by-case discretion in considering whether certain exemptions apply. Those exemptions allow animals to be spared despite being on the same farm as the animals designated for depopulation as long as the exempted animals are part of a distinct epidemiological unit and meet certain criteria: *FC Decision* at paras. 96–97, 105–109.

B. *The December 2024 outbreak at the appellant's farm*

[15] The appellant has operated its farm for over 30 years as a family business. A pond at the heart of the premises and the frequent visits to it by wild ducks, sometimes numbering in the

hundreds, render the farm particularly vulnerable to virus transmission to and from the ostriches, HPAI infection, and long-term contamination: *FC Decision* at paras. 16, 24. By early December 2024, the appellant reportedly housed approximately 450 ostriches in outdoor pens at the farm: *FC Decision* at para. 27.

[16] In February 2020, the appellant's flock experienced an illness, confirmed at the time through testing to be a bacterial infection, but which the appellant (without any confirmatory testing) now alleges might have been avian influenza: *FC Decision* at para. 28.

[17] In December 2024, within a week of many wild ducks landing on the premises, numerous ostriches experienced "flu-like" symptoms. Around 25 to 30 ostriches died over a three-week period. The appellant did not report these deaths to a CFIA designated veterinary inspector. The currently circulating version of HPAI is a reportable disease under the *Reportable Diseases Regulations*, SOR/91-2, and subsection 5(1) of the *Act* requires notification to the nearest veterinary inspector in cases of a suspected reportable disease.

[18] The CFIA intervened on December 28, 2024, following an anonymous tip to its sick bird call line and imposed quarantine measures: *FC Decision* at paras. 29–30. On December 30, 2024, and in the weeks that followed, the CFIA's inspectors visited the site and noted various biosecurity risks, including wild bird activity, staff and equipment moving between open pens, and breaches of quarantine protocols, as well as ostrich carcasses laying dead in the pens or being dragged between pens without proper precautions: *FC Decision* at paras. 31, 256.

[19] On December 31, 2024, the samples collected from two carcasses the previous day came back positive for HPAI, later confirmed on January 3, 2025 as the H5N1 strain of HPAI. Some 41 minutes after the initial positive result, a CFIA inspector issued a Notice to Dispose of all the ostriches, pursuant to section 48 of the *Act* and in accordance with the 2022 ERP. The deadline for compliance was February 1, 2025: *FC Decision* at paras. 32–33. The CFIA and the appellant continued to discuss an application for exemption in the days that followed. The CFIA's Exemption Committee denied that application on January 10, 2025: *FC Decision* at paras. 34–41.

[20] According to the appellant, the spread of the illness plateaued in mid-January with the last of the 69 confirmed ostrich deaths occurring on January 15, 2025. The appellant has sought to adduce fresh evidence before this Court that it alleges confirms the continued recovery of the flock. In late January, the appellant requested the CFIA undertake additional testing, but this request was denied: *FC Decision* at paras. 42–43.

II. The Decision of the Federal Court

[21] In reviewing the Federal Court's reasons, we provide a high-level summary and will address the elements of the Federal Court's decision that are attacked on appeal in greater detail throughout our reasons.

[22] The Federal Court upheld the Stamping-Out Policy as a reasonable exercise of the CFIA's discretion within the confines of the *Act*'s text and purpose, the available science, and international trade considerations: *FC Decision* at para. 157. The Federal Court also confirmed

the reasonableness of the Notice to Dispose since the Stamping-Out Policy dictated that result: *FC Decision* at para. 197. The Federal Court further found that no impermissible fettering of the Minister's discretion occurred since the CFIA, acting as the delegate of the Minister and pursuant to the Minister's discretion under section 48 of the *Act*, could dictate the process to follow in the Stamping-Out Policy in response to a positive test result for HPAI. In addition, the overall process permitted sufficient circumstantial discretion at the exemption stage: *FC Decision* at para. 192. The Exemption Denial was also held to be reasonable as the Exemption Committee's reasons demonstrated that it properly understood the relevant criteria, adequately engaged with the evidence, accounted for its decision's impact on the appellant, and the outcome it reached was defensible: *FC Decision* at paras. 232–266.

III. Analysis

A. *Should the fresh evidence be admitted?*

[23] We commence our analysis by considering the appellant's motion to adduce fresh evidence. The appellant seeks to adduce an affidavit from one of its principals, which speaks to two matters: first, the alleged ineffective assistance of counsel who represented the appellant before the Federal Court, and, second, the allegedly healthy state of the flock since January 2025.

(1) The current health status of the flock

[24] We deal first with the second matter and note that the general theme of this portion of the fresh evidence and its proposed use is that the flock's alleged recovery negates the need for culling, which the appellant contends means that the Minster's decisions are unreasonable. Putting aside the strength of this evidence, which is not independent scientific proof, this proposed use is contrary to this Court's role on judicial review.

[25] The general rule is that "only the evidence that was before the administrative decision-maker is relevant and, thus, admissible. As a result, post-decision evidence is normally irrelevant and, thus, inadmissible" (*Coldwater First Nation v. Canada (Attorney General)*, 2019 FCA 292 [*Coldwater 2019*] at para. 23. See also *Association of Universities & Colleges of Canada v. Canadian Copyright Licensing Agency (Access Copyright)*, 2012 FCA 22, 428 F.T.R. 297 [*Access Copyright*] at paras. 18–19.)

[26] The bar on admitting additional evidence on judicial review recognizes that it is not the role of the courts to engage in fact-finding or to otherwise re-decide the merits of an administrative decision: *Access Copyright* at paras. 17–19; *Delios v. Canada (Attorney General)*, 2015 FCA 117, 472 N.R. 171 at para. 52. Exceptions to the general rule may be available where admitting the evidence would not frustrate the differing roles of administrative decision-makers and reviewing courts: see *Bernard v. Canada (Revenue Agency)*, 2015 FCA 263, 479 N.R. 189 at paras. 14–18; *Andrews v. Public Service Alliance of Canada*, 2022 FCA 159 at para. 21, leave to appeal to SCC refused, 40451 (16 February 2023).

[27] The appellant is encouraging the Court to use the fresh evidence to re-decide the CFIA's decisions based on what it claims is the situation today. That is not our role. We are only tasked with reviewing the reasonableness of the CFIA's decisions at the time they were made, which is the essence of the judicial review remedy.

[28] Few decisions are of such a nature as to require a court to use the most up-to-date evidence available in undertaking its review: for examples of exceptional circumstances, see *Coldwater 2019* at para. 27; *Singh Brar v. Canada (Public Safety and Emergency Preparedness)*, 2024 FCA 114 at paras. 57–58, leave to appeal to SCC refused, 41386 (27 February 2025) and 41388 (27 February 2025) [*Singh Brar*]. Both cases are distinguishable as in *Coldwater 2019*, the Crown was subject to an ongoing duty to consult with Indigenous peoples, and in *Singh Brar*, the ongoing reasonableness of the no-fly list was at issue.

[29] Conversely, in the present case, the Notice to Dispose and the Exemption Denial do not call for a constant reconsideration by the courts over time. Had the Federal Court not granted a stay of the Notice to Dispose, the appellant's flock would have been culled months ago. In our view, the stays granted by the Federal Court and by a single judge of this Court in the present case cannot be used as a mechanism aimed at giving the appellant the chance to ask this Court for a reconsideration that would effectively undo the application of the Stamping-Out Policy. Should the appellant wish to have the Notice to Dispose re-examined in light of the fresh evidence, its recourse is to ask the CFIA or the Minister to do so.

[30] The only potentially relevant exception in this case to the general rule that prevents fresh evidence in a judicial review application would be one that recognizes that fresh evidence may be admitted for the exercise of remedial discretion by courts where "no practical purpose would be served by quashing and sending the matter back" (*Namgis First Nation v. Canada (Fisheries and Oceans)*, 2019 FCA 149 at para. 10(d). See also *Coldwater 2019* at paras. 25, 28.)

[31] However, that principle has no application here. Even if we were to find the decisions unreasonable, this is not a case where it would be appropriate for this Court to quash the proceedings. The apparent current health status of the flock does not change the fact that it is for the Minister or the CFIA to decide the response to an HPAI outbreak, and there is no forgone conclusion as to what any re-examination decision might be.

[32] Thus, we find that the fresh evidence as to the current health status of the appellant's flock is inadmissible.

(2) Evidence of ineffective assistance

[33] We also decline to admit the evidence of ineffective assistance of counsel due to the nature of this appeal, where the alleged ineffectiveness occurred before a lower court hearing an application for judicial review.

[34] The affidavit the appellant wishes to tender outlines that the appellant's counsel before the Federal Court took a security interest for unpaid legal fees in the proceeds that the appellant

would receive under the *Compensation for Destroyed Animals and Things Regulations*, SOR/2000-233 [*Compensation Regulations*] if the flock were destroyed. Attached as exhibits to the affidavit are copies of the security agreement as well as email communications between the appellant's principals, its counsel before the Federal Court, and another lawyer who acted as independent counsel to the appellant regarding the security agreement. The appellant alleges this security interest created a conflict of interest.

[35] In *Mediatube Corp. v. Bell Canada*, 2018 FCA 127, 156 C.P.R. (4th) 289 [*Mediatube*], a case involving a trial—as opposed to an application for judicial review—where ineffective assistance of trial counsel was alleged, Justice Stratas explained at paragraph 58 that "[i]n adducing evidence, the appellant does not need to satisfy the stringent test for fresh evidence in *Palmer v. The Queen*, [1980] 1 S.C.R. 759". Subsequent case law provides that "the evidence being adduced 'must be admissible (applying the usual rules of evidence), relevant to the issue raised on appeal, and credible'" (*Nguyen v. 1108911 B.C. Ltd.*, 2024 BCCA 48 [*Nguyen*] at para. 15, citing *Boone v. Jones*, 2023 BCCA 215 at para. 34, *R. v. Aulakh*, 2012 BCCA 340, 326 B.C.A.C. 177 at paras. 59–67, and *Beaulieu v. Winnipeg (City of)*, 2021 MBCA 93 at paras. 28–35, 54–63).

[36] As for what is required for the appellant to succeed on this ground, "the appellant must show that counsel's acts or omissions constituted incompetence and a miscarriage of justice resulted" (*Mediatube* at para. 29, citing *R. v. G.D.B.*, 2000 SCC 22, [2000] 1 S.C.R. 520). In the context of an appeal, an actual conflict that affected counsel's performance is generally

sufficient; typically, it need not have affected the result of the trial: *Mediatube* at para. 57. See also *Nguyen* at para. 54.

[37] The foregoing statements regarding admissibility on appeal of evidence of alleged incompetence of counsel before a lower court must be modified in the context of an allegation of ineffective counsel before a lower court presiding over an application for judicial review, rather than a trial, due to the different standard of review applied in a judicial review appeal as opposed to other appeals.

[38] On appeal in a judicial review application, like the present one, this Court must determine whether the Federal Court identified the proper standard of review to be applied to the CFIA's decisions and whether it properly applied that standard: *Agraira v. Canada (Public Safety and Emergency Preparedness)*, 2013 SCC 36, [2013] 2 S.C.R. 559 [*Agraira*] at paras. 45–47; *Northern Regional Health Authority v. Horrocks*, 2021 SCC 42, [2021] 3 S.C.R. 107 [*Horrocks*] at paras. 10–12. Therefore, this Court essentially steps into the shoes of the Federal Court, performs a *de novo* review of the CFIA's decisions, and accords "no deference to the reviewing judge's application of the standard of review" (*Horrocks* at para. 10.)

[39] This Court has previously held that what is in essence a "do-over" on appeal effectively cures breaches of procedural fairness that occur before the Federal Court in a judicial review application: see *Haynes v. Canada (Attorney General)*, 2023 FCA 158 at paras. 14–16, leave to appeal to SCC refused, 41047 (6 June 2024); *Whitelaw v. Canada (Attorney General)*, 2025 FCA 68 at paras. 10, 16; *Jagadeesh v. Canadian Imperial Bank of Commerce*, 2024 FCA 172 at

para. 40. That logic applies equally to allegations of ineffective assistance of counsel before the Federal Court in a judicial review application.

[40] An exception would arise only if an appellant raises errors in the court below for matters to which appellate standards of review apply, namely, "findings of fact or mixed fact and law based on the consideration of evidence at first instance" (*Apotex Inc. v. Canada (Health)*, 2018 FCA 147, 157 C.P.R. (4th) 289 at para. 57) or in its exercise of remedial discretion (see e.g., *Makivik Corporation v. Canada (Attorney General)*, 2021 FCA 184 at para. 65). The appellant does not allege that the Federal Court erred in respect of any such matters.

[41] Thus, the appellant's ability to directly challenge the CFIA's decisions before us means that the evidence of ineffective assistance is not relevant on appeal and should not be admitted: see *Nguyen* at para. 15.

[42] We also wish to note, having reviewed the affidavit of the appellant's principal to determine its admissibility, that the evidence falls far short of what is required to prove ineffective assistance because it does not establish a conflict of interest. Notably, counsel's security interest also extended to all the appellant's present and after acquired personal property. The appellant failed to adduce evidence demonstrating that the compensation received from the Minister was the only, or even the most feasible way, for counsel to collect their fees. Additionally, the appellant did not provide any case law or guidance from a provincial law society suggesting that this type of security interest would be inappropriate. Based on the Federal

Court decision and record before us, there is nothing that in any way impugns the integrity or performance of counsel before the Federal Court.

[43] We therefore dismiss the appellant's motion to adduce fresh evidence.

B. *Standard of review*

[44] As noted, on appeal, this Court must determine whether the Federal Court identified the proper standard of review to be applied to the CFIA's decisions and whether it properly applied that standard: *Agraira* at paras. 45–47; *Horrocks* at paras. 10–12. The parties agree with the Federal Court's selection of the reasonableness standard but disagree on its application.

[45] The appellant focuses much of its submissions on errors it alleges were made by the Federal Court in detailing the applicable principles. For that reason, we address those concerns and explain the approach to be taken in light of *Canada (Minister of Citizenship and Immigration) v. Vavilov*, 2019 SCC 65, [2019] 4 S.C.R. 653 [*Vavilov*], the leading authority on judicial review. Thereafter, we assess afresh the reasonableness of the CFIA's decisions.

C. *The approach to reasonableness review in this matter*

[46] We start the discussion by noting that the Federal Court largely adopted the general approach to reasonableness review, as outlined by the Supreme Court of Canada in *Vavilov*, to

the review of the CFIA's two decisions and to the CFIA's adoption of the Stamping-Out Policy: see *FC Decision* at paras. 72–74.

[47] Prior to the decision in *Vavilov*, the approach to reviewing policy decisions framed reasonableness around whether a decision was made in "bad faith, did not conform with the principles of natural justice, or if reliance was placed upon considerations that are irrelevant or extraneous to the legislative purpose" (*Malcolm v. Canada (Fisheries and Oceans)*, 2014 FCA 130, 460 N.R. 357 at para. 32, leave to appeal to SCC refused, 36012 (20 November 2014), citing *Maple Lodge Farms v. Government of Canada*, [1982] 2 S.C.R. 2, 1982 CanLII 24 [*Maple Lodge*] and *Carpenter Fishing Corp. v. Canada* (1997), 155 D.L.R. (4th) 572, 1997 CanLII 26668 (F.C.A).)

[48] Neither party contests that *Vavilov* has overtaken the *Maple Lodge* categories of unreasonableness. The parties did not refer us to any decision of this or another appellate court that has ruled on this question. We note, however, that the Federal Court has split on the issue of the continued relevance of the *Maple Lodge* categories: *Mowi Canada West Inc. v. Canada (Fisheries, Oceans and Coast Guard)*, 2022 FC 588, 48 C.E.L.R. (4th) 122 at para. 240; *Saltstream Engineering Ltd. v. Canada (Fisheries, Oceans and Coast Guard)*, 2022 FC 621 at para. 59, *Barry Seafoods NB Inc. v. Canada (Fisheries, Oceans and Coast Guard)*, 2021 FC 725 at para. 35; *South Shore Trading Co. Ltd. v. Canada (Fisheries, Oceans and Coast Guard)*, 2025 FC 174 [*South Shore*] at paras. 49–51; *Munroe v. Canada (Attorney General)*, 2021 FC 727 at paras. 40, 43–45; *Fortune Dairy Products Limited v. Canada (Attorney General)*, 2020 FC 540

at para. 105; *Prince Edward Island Fishermen's Association Ltd. v. Canada (Attorney General)*, 2025 FC 737 at paras. 81–84.

[49] We agree with the parties and the Federal Court in the instant case that *Vavilov* requires reformulation of how reasonableness review applies to discretionary policy decisions and that the approach in *Maple Lodge* has been overtaken.

[50] In this regard, we see no principled reason why the reasonableness review of a discretionary policy decision should not be framed in the manner set out in *Vavilov*, which asks whether a decision "bears the hallmarks of reasonableness — justification, transparency and intelligibility — and whether it is justified in relation to the relevant factual and legal constraints that bear on the decision": *Vavilov* at para. 99.

[51] *Vavilov* is the starting point for undertaking a judicial review and sets out a holistic approach. Earlier case law on conducting reasonableness review can provide insight but must be aligned with the *Vavilovian* approach: *Vavilov* at para. 143. Discretionary policy decisions should not be an exception. The Supreme Court in *Vavilov* noted the existence of decisions by "ministers" and matters of "high policy" (at para. 88). Yet, it held that "reasonableness remains a single standard, and elements of a decision's context do not modulate the standard or the degree of scrutiny by the reviewing court" but instead act as constraints (at para. 89).

[52] This Court in *Entertainment Software Association v. Society of Composers, Authors and Music Publishers of Canada*, 2020 FCA 100, [2021] 1 F.C.R. 374 [*Entertainment Software*] at

paragraphs 25–30, aff'd 2022 SCC 30, [2022] 2 S.C.R. 303 outlined a variety of policy-laden decisions, subject to review for reasonableness that are unconstrained in nature and are thus very hard to set aside, and noted that, unless an exception applies, reasonableness as mandated by *Vavilov* is the correct approach to reviewing policy-laden decisions. Thus, the categories listed in *Maple Lodge* now serve as examples of when a discretionary policy decision would be unreasonable but do not fully categorize unreasonable policy decisions. Rather, the requisite analysis is that mandated by *Vavilov.*

[53] Pursuant to *Vavilov*, reasonableness review is deferential, and the reviewing court does not ask itself what decision it would have made or whether the decision under review is correct (at para. 83). Rather, the reviewing court is limited to considering whether the outcome of an administrative decision is transparent, intelligible, and justified in light of the reasons, if any, that may have been given by the administrative decision-maker and in light of the legal and factual constraints that bear on the decision: *Vavilov* at paras. 85, 99. Where no reasons are given for a decision, as is often the case when a policy is adopted, reasonableness review requires a reviewing court to consider the reasonableness of the policy in light of the record before the administrative decision-maker and the relevant constraints, including the applicable statutory provisions: *Vavilov* at paras. 137–138.

[54] In the present case, no reasons were given for the adoption of the Stamping-Out Policy or the Notice to Dispose decision. Thus, we are called upon to determine if they were reasonable in light of the *Act* and, in particular, the broad discretion afforded to the Minister or ministerial delegates under section 48, and in light of the relevant contextual factors, which include the prior

case law of this Court and of the Federal Court in similar cases and the record that was before the CFIA. Reasons were provided for the Exemption Denial decision; its reasonableness must therefore be assessed in light of those reasons and the relevant contextual factors, which also include the *Act* and the broad discretion afforded to the Minister or ministerial delegates under section 48, the prior case law of this Court and of the Federal Court in similar cases, and the record before the Exemption Committee, including the appellant's submissions to it.

[55] Fact-based determinations may be reviewed pursuant to the formulation established by *Vavilov*, but the bar for establishing unreasonableness is high. For a decision to be unreasonable on a factual basis, an applicant must demonstrate that the "decision maker has fundamentally misapprehended or failed to account for the evidence before it" (*Vavilov* at para. 126), or in the words of paragraph 18.1(4)(d) of the *Federal Courts Act*, R.S.C. 1985, c. F-7, "based its decision or order on an erroneous finding of fact that it made in a perverse or capricious manner or without regard for the material before it". See also *Canada (Attorney General) v. Best Buy Canada Ltd.*, 2021 FCA 161 [*Best Buy*] at paras. 114, 121–123. Where there was factual evidence before the decision-maker that is capable of supporting its decision (unless the decision-maker is shown to have ignored crucial evidence going the other way), the decision will generally be reasonable: *Best Buy* at paras.123, 129–130.

[56] Discretionary policy decisions are also reviewable for reasonableness, but, once again, the bar for establishing unreasonableness is high, often requiring an applicant to establish that the decision fails to respect the provisions in the statute pursuant to which the discretionary decision was made, which may provide constraints on the way in which discretion was exercised:

Entertainment Software at paras. 31–33. See also Donald J.M. Brown et al., *Judicial Review of Administrative Action in Canada* (Toronto: Thomson Reuters Canada, 2009) (looseleaf release 2025-02) (WL) at § 15:63.

D. *The Appellant's Arguments*

[57] As noted, the appellant focused almost the entirety of its submissions on errors it alleges that the Federal Court made in its articulation of the applicable legal principles and made little submissions on whether the decisions at issue are reasonable. To the extent such submissions were made, they largely focussed on the appellant's disagreement with the application of the Stamping-Out Policy to ostriches, which it alleges were not considered by the CFIA when it adopted the Stamping-Out Policy and which it contends are different from other domestic flocks due to their higher survival rates when infected with HPAI. The appellant also alleges that the CFIA's decisions should be re-evaluated by this Court in light of the current circumstances, but, as already noted, that is not something this Court can do on an appeal from a decision dismissing a judicial review application or that, more generally, any reviewing court may do.

[58] We turn next to consideration of the various errors that the appellant alleges the Federal Court made.

(1) Did the Federal Court err in limiting its analysis of the reasonableness of the Stamping-Out Policy by focussing exclusively on whether the Policy bore some connection to the disease control objectives in the *Act*?

[59] The appellant first contends that, instead of following the approach in *Vavilov*, the Federal Court improperly relied on the decision in *Auer v. Auer*, 2024 SCC 36, 497 D.L.R. (4th) 381 [*Auer*] to limit its analysis of whether the Stamping-Out Policy was reasonable by asking only whether that policy "bore some connection to disease control objectives" in the *Act*: Appellant's Memorandum of Fact and Law, at para. 42.

[60] In *Auer*, the Supreme Court of Canada determined that the reasonableness standard of review applies to the review of regulations adopted under a statute. In assessing the reasonableness of the regulations at issue, the Supreme Court focused on the relevant contextual factors in that case, namely the constraints contained in the legislation pursuant to which the regulations were promulgated: see *Auer* at paras. 59–60.

[61] In the decision under appeal, the Federal Court applied the reasoning in *Auer* by analogy: see *FC Decision* at para. 75. However, contrary to what the appellant contends, the Federal Court did not limit its analysis of the reasonableness of the Stamping-Out Policy only to consideration of whether that policy bore some connection to the disease control objectives in the *Act*. Its analysis was broader and included consideration of relevant factual constraints, albeit with appropriate deference and recognition that it is not up to a reviewing court to re-weigh or re-decide factual matters, particularly when the facts are scientific in nature. This is evident at several places in the Federal Court's reasons.

[62] For example, at paragraphs 75–79, the Federal Court wrote:

> [75] Although *Auer* addressed specifically decisions to make subordinate legislation, its reasoning logically extends to policymaking decisions. The key connective tissue is the source of authority: in both contexts, the decision-maker exercises broad, delegated discretionary power to pursue legislative objectives. *Vavilov* has identified the governing statute, other relevant law, and factual context as the "legal and factual constraints" on every administrative act: *Vavilov* at paras 105-135. Therefore, whether discretion manifests through formal regulations or through general policy directives, administrative decision-makers must always interpret their enabling provisions purposively, act within statutory boundaries, and demonstrate that their legislative or quasi-legislative actions advance the statutory objectives given the available legal and factual constraints.
>
> [76] Consequently, the core reasonableness review considerations articulated in *Auer* should also apply to policymaking decisions. The analytical framework should not turn on the formal label of "regulation." What matters most is the nature of the decision itself. Specifically, whether it creates generally applicable rules on statutory authority to be applied by more frontline decision-makers in the administrative decision-making chain. This description encompasses ministerial directives, Cabinet guidelines, and disease-control policies no less than regulations. Accordingly, the analytical framework in *Auer* that includes the principles of presumption of validity, purposive interpretation, and prohibition on merits review should also guide courts reviewing any policymaking decision. Ultimately, the inquiry remains whether the decision to adopt the policy instrument is grounded in a rational, purposive interpretation of the enabling statute and respects all relevant procedural, substantive, and contextual limits.
>
> [77] Deference is particularly warranted for policy decisions intended to safeguard animal and public health from high-risk disease. Case law has shown this principle consistently. In *Kohl v Canada (Department of Agriculture)*, [1995] FCJ No. 1076 (FCA) [*Kohl*], the Federal Court of Appeal described a ministerial order made under section 48 of the *Act* as a "policy decision obviously not subject to the requirements of the rules of natural justice or procedural fairness," reviewable solely for abuse or misuse of power: *Kohl* at para 18.
>
> [78] The teaching from *Kohl* is clear. Where a policy decision ordering blanket disposal of affected animals and things is made in good faith, reviewing courts should confine their reasonableness analysis to whether the destruction advances the objectives of the *Act* and whether there is some evidence to support the underlying suspicion. Following *Vavilov*, the threshold for finding sufficient support today is undoubtedly reasonableness, meaning the question is whether the suspicion is reasonably supported by the evidence and consistent with applicable legal constraints. Substituting a different view of the scientific and operational

> determinations underlying the policy decision would risk treading on the executive's policy prerogative: *Kohl* at paras 20–22.
>
> [79] *Entertainment Software*, *South Shore*, *Kohl* and *Auer* converge into a single guiding principle: courts serve as guardians of legality, not arbiters of the wisdom of policy. When the legislature explicitly delegates public interest decisions, such as the management of animal and public health, to administrative actors, courts must leave assessment of policy merits, especially the nuanced balancing of scientific, economic, and social factors, to decision-makers tasked by Parliament with those responsibilities. Judicial review of policy decisions should only target compliance with legal and factual constraints, and verification of whether the alleged exercise of technical expertise in formulating the policy decisions has been sufficiently demonstrated.
>
> (emphasis added.)

[63] In concluding that the Stamping-Out Policy was not unreasonable due to its adoption of what the appellant alleged was outdated science, the Federal Court also held at paragraphs 166–168:

> […] These continuous updates and refinements have persisted through to the current *2022 ERP* instrument, which integrates ongoing decision records, regular multidisciplinary reviews, and international expert consultations, including with the U.S. Department of Agriculture's Animal & Plant Health Inspection Service [APHIS].
>
> [167] Besides refinements to specific policy guides, the CFIA has also consistently explored alternatives to the Stamping-Out Policy itself throughout the years, including vaccination, containment strategies such as "burn out," and selective culling. The [*2013 Notifiable Avian Influenza Hazard-Specific Plans*] specifically contemplated a "burning out" option for [low pathogenic avian influenza] strains in remote, non-commercial premises with inadequate resources, though this option was removed from the *2022 ERP* due to the greater risks to animal health, public health and the environment caused by the spread of HPAI. In December 2022, the CFIA conducted extensive consultations in response to requests from poultry producers in British Columbia to apply selective killing rather than complete stamping out. These consultations were both internal and external. The Agency weighed the benefits and harms of selective killing, specifically factors such as increased prevalence of HPAI, the immediate loss of some international markets, and a potential increase in resources required in the longer term for surveillance, and delayed depopulation procedures. Ultimately,

> the CFIA concluded that the Stamping-Out Policy remained the most effective in controlling the spread of highly infectious HPAI to other flocks, wild birds and mammals, including humans, while also maintaining alignment with the internationally accepted approach to HPAI management and control.
>
> [168] All these extensive, iterative, and consultative review and update processes directly address the only question properly before this Court on this point: whether the CFIA has remained responsive to evolving scientific and policy developments, and nonetheless determined, on reasoned grounds and with material factors considered, that continued application of the Stamping-Out Policy properly advances the objectives of the *Act*. The record before me supports a resounding answer in the affirmative. Whether the Applicant's experts might weigh scientific data differently, or prefer alternative policy approaches, is irrelevant to the reasonableness review that this Court must conduct here.
>
> (emphasis added.)

[64] Thus, the Federal Court assessed whether there was a factual basis before the CFIA to support its suspicion that HPAI might be present in epidemiological units to which the Stamping-Out Policy applies and also considered whether the Stamping-Out Policy advances the policy objectives of the *Act*. We see no error in this approach and, in any event, for the reasons noted below in our fresh consideration of the Stamping-Out Policy, have also come to the conclusion that the Stamping-Out Policy is reasonable.

(2) Did the Federal Court err in being overly deferential to the evidence from the CFIA scientists?

[65] The appellant next contends that the Federal Court was overly deferential to the expertise of the CFIA's scientists, suggesting that the so-called "academy of science" case law is no longer good law, post-*Vavilov*.

[66] Throughout its reasons, the Federal Court emphasized that in undertaking reasonableness review, courts cannot resolve scientific disputes or otherwise re-decide the scientific merits of a decision: *FC Decision* at paras. 6, 69, 84, 133, 162–163, 165, 168, 201. The appellant argues that this framing amounts to impermissible "rubber-stamping", excessively defers to the decision-maker's expertise, and is thus contrary to the approach in *Vavilov*.

[67] We disagree and find that the Federal Court appropriately applied *Vavilov* to the scientific issues the appellant raised. As noted, *Vavilov* mandates that courts consider whether a decision "bears the hallmarks of reasonableness — justification, transparency and intelligibility — and whether it is justified in relation to the relevant factual and legal constraints that bear on the decision": *Vavilov* at para. 99. The required considerations apply to all decisions, including those that involve the assessment and weighing of scientific evidence.

[68] However, reasonableness review does not call for courts to become the merits-decider: *Safe Food Matters Inc. v. Canada (Attorney General)*, 2022 FCA 19, 46 C.E.L.R. (4th) 185 [*Safe Food*] at para. 37. Courts cannot reweigh the evidence, second-guess the exercise of discretion, or undertake their own statutory interpretation exercise: *Safe Food* at para. 39. Rather, they are limited to determining whether the administrative decision-maker's determinations were reasonable.

[69] In addition, some determinations based on the assessment and weighing of scientific evidence, like the adoption of the Stamping-Out Policy, may arise in the context of relatively unconstrained decisions that are harder to set aside: *Entertainment Software* at para. 30.

[70] We note that the Federal Courts have often framed deference to science-based determinations around the courts not being an "academy of science": see *Greenpeace Canada v. Canada (Attorney General)*, 2016 FCA 114, 2 Admin. L.R. (6th) 1 at paras. 60–61; *Coldwater First Nation v. Canada (Attorney General)*, 2020 FCA 34, 444 D.L.R. (4th) 298 at para. 119, leave to appeal to SCC refused, 39111 (2 July 2020); *Inverhuron & District Ratepayers' Assn. v. Canada (Minister of The Environment)* (2000), 191 F.T.R. 20, 2000 CanLII 15291 (T.D.) at para. 71; *Inverhuron & District Ratepayers Ass. v. Canada (Minister of The Environment)*, 2001 FCA 203, 206 F.T.R. 318; *Ontario Power Generation Inc v. Greenpeace Canada*, 2015 FCA 186, 388 D.L.R. (4th) 685 at para. 126, leave to appeal to SCC refused, 36711 (28 April 2016); *South Shore* at para. 58; *Shelburne Elver Limited v. Canada (Attorney General)*, 2025 FC 566 at para. 68; *Canadian Committee For a Sustainable Eel Fishery Inc. v. Canada (Fisheries, Oceans and Coast Guard)*, 2024 FC 1951 at para. 31; *Georgia Strait Alliance v. Canada (Environment and Climate Change)*, 2025 FC 54, 65 C.E.L.R. (4th) 319 at para. 150; *Peguis First Nation v. Canada (Attorney General)*, 2021 FC 990, 47 C.E.L.R. (4th) 26 at para. 171, aff'd 2023 FCA 163, 59 C.E.L.R. (4th) 1; *Citizens Against Radioactive Neighbourhoods v. BWXT Nuclear Energy Inc.*, 2022 FC 849, 51 C.E.L.R. (4th) 125 at para. 80.

[71] As noted by the Supreme Court at paragraph 143 of *Vavilov*, principles relating to reasonableness review developed pre-*Vavilov*, such as the "academy of science" jurisprudence, must be aligned with the reasons in *Vavilov*. Such alignment recognizes that some administrative decision-makers, like the CFIA, are required to assess and weigh scientific evidence and that reviewing courts must refrain from reweighing and reassessing this evidence. Thus, a reviewing court may intervene only if an applicant for judicial review establishes that the decision-maker

has fundamentally misapprehended or failed to account for the evidence before it: *Vavilov* at paras 125–126.

[72] This approach is the correct one and is precisely what the Federal Court did in the instant case.

(3) Did the Federal Court err in its interpretation of section 48 of the *Act*?

[73] The appellant next says that the Federal Court erred in its interpretation of section 48 of the *Act*.

[74] The Federal Court explained that section 48 of the *Act* grants the Minister broad discretion but only within the confines of a "functional binary of destruction and treatment", leaving "no room for a third 'wait-and-see' approach" (at para. 83). The Federal Court added that the possibility of treatment is "limited by scientific and operational realities", such as scientific viability and scientific feasibility, meaning that destruction is the only option where treatment is not available: at para. 84. The Federal Court also recognized the possibility for compensation under the *Compensation Regulations* as being in line with the *Act*'s protective rather than punitive purpose: at para. 85.

[75] The appellant argues that this "binary" interpretation is contrary to the permissive "may" language in section 48 of the *Act* as well as the possibility of quarantine, treatment, or destruction under subsection 5(1) of the *Health of Animals Regulations*, C.R.C., c. 296 [*Regulations*]. The

appellant also submits that the Federal Court's approach frustrates the *Act*'s dual purpose of controlling animal disease and protecting Canada's animal resource base by only focusing on the former.

[76] The respondent concedes that section 48 of the *Act* may provide the Minister more than the binary option of destroying or treating animals. We agree and thus find that the Federal Court did err in suggesting that only two options are available to the Minister under section 48 of the *Act* when confronted with a possible transmissible illness in an animal. However, nothing turns on this because the appellant's argument misunderstands the nature of this Court's review. In addition, its other submissions misunderstand the statutory scheme established by the *Act.*

[77] This Court is not sitting in appeal of the Federal Court's reasons. Instead, as already noted, this Court must, itself, determine whether the CFIA's decisions should be set aside.

[78] The Federal Courts have already held that section 48 of the *Act* allows the Minister to exercise discretion to establish a blanket policy that provides for the destruction of animals that fall within its ambit: *David Hunt Farms Ltd v. Canada (Minister of Agriculture)* (1994), 74 F.T.R. 270, [1994] F.C.J. No. 314 (Q.L.) (T.D.) [*Hunt*], aff'd (1994), 170 N.R. 75, [1994] F.C.J. No. 677 (Q.L.) (F.C.A.), leave to appeal to SCC refused, 24281 (2 February 1995). See also *Jerram v. Canada (Minister of Agriculture)*, [1994] 3 F.C. 17, 1994 CanLII 3471 (T.D.) [*Jerram*].

[79] As such, it is permissible that the Stamping-Out Policy itself, rather than its implementation by ground-level employees, would ultimately determine the fate of the appellant's flock. The question thus becomes whether, in adopting the Stamping-Out Policy, the Minister adequately considered the discretion under section 48 of the *Act* to order or not the disposal of animals who are contaminated by a disease or have been in close proximity to an animal that was or is suspected of having been contaminated by a disease, such as animals in the same epidemiological unit as animals that have tested positive for HPAI. For the reasons set out below, we have determined that this option was adequately considered and that the Stamping-Out Policy is reasonable.

[80] As for the options available to inspectors under section 5 of the *Regulations*, the Federal Court at paragraph 43 of its decision in *Hunt* explains that the authority under section 48 of the *Act* is vested in what is now the Minister of Agriculture and Agri-Food rather than the inspectors. Quarantine under section 5 of the *Regulations* plays only a temporary role in the process. Accordingly, the *Regulations* do not constrain the Minister's authority to establish the Stamping-Out Policy.

[81] Another key element of the statutory scheme is that actual infection is not a prerequisite for destruction. Section 48 explicitly allows for destruction in the face of mere suspicion of infection or exposure to suspected infection. In *Jerram* at page 30, the Federal Court upheld the Minister's "very low level of risk tolerance" in destroying animals that may not be infected. Similarly, at paragraph 29 of *Hunt*, the Federal Court upheld the Minister's consideration of "the possibility that these animals may not be affected by the disease, but that this circumstance was

not sufficient to change the decision being made". In *Kohl v. Canada (Department of Agriculture)* (1995), 185 N.R. 149, [1995] F.C.J. No. 1076 (Q.L.) (F.C.A.) [*Kohl*] at paragraph 20, this Court explained that the *Act* gives the Minister significant discretion and "directs him to act on the basis of mere suspicion".

[82] As will soon become apparent, the foregoing case law and the breadth of the discretion afforded to the Minister under section 48 of the *Act* means that there is very limited room for finding the Stamping-Out Policy to be unreasonable.

(4) Did the Federal Court err in concluding that the Minister had not improperly fettered the discretion available under section 48 of the *Act*?

[83] The appellant next contends that the Federal Court erred in declining to find that the Stamping-Out Policy impermissibly fettered the Minister's discretion. We disagree and find that neither the Notice to Dispose nor the Exemption Denial were the result of fettering. As explained earlier, *Hunt* determines that it is permissible for the Minister to establish blanket destruction policies under section 48 of the *Act* based on identified criteria which leave no discretion to individual inspectors. The appellant erroneously suggests that the inspector in the present case could or should have deviated from the Stamping-Out Policy. This argument cannot succeed in light of the holding in *Hunt*.

[84] We also agree with the Federal Court that the overall process was not blind to the appellant's circumstances. The possibility of an exemption introduces discretion in the process. In this case, the appellant did not satisfy the exemption criteria in the 2022 ERP. However, the

CFIA considered the appellant's request. The decision record for the Exemption Denial shows that the CFIA considered but ultimately rejected a "significant policy deviation" in the form of selective culling following additional testing.

[85] We accordingly see no error in the Federal Court's conclusion that none of the decisions at issue were inappropriately fettered.

(5) Did the Federal Court err in failing to consider the reasonableness of the CFIA's refusal to conduct testing after the flock allegedly recovered from HPAI?

[86] The appellant further submits that the Federal Court erred in failing to consider the CFIA's refusal to allow for additional testing of the flock. The appellant says that the denial of ongoing testing should have been considered by the Federal Court as part of the "ongoing conduct" under review, citing *David Suzuki Foundation v. Canada (Health)*, 2018 FC 380, 34 Admin. L.R. (6th) 21 at para. 173.

[87] The simple answer to this alleged error is that these arguments were not made to the Federal Court nor raised in the appellant's Notices of Application for Judicial Review. The Federal Court cannot be faulted for failing to consider arguments that were not made.

[88] We accordingly conclude that none of the errors the appellant alleges the Federal Court made in the decision below provide any basis for our intervention.

E. *Were the impugned decisions reasonable?*

[89] We turn next to assessing the ground that is most relevant in this appeal, namely, the reasonableness of the CFIA's decisions, and conclude that they were all reasonable.

[90] As noted, before this Court, the appellant primarily attacks the Stamping-Out Policy for the CFIA's alleged failure to consider the particularities of ostriches and its failure to provide for retesting or reconsideration of alternatives after the ostriches allegedly recovered. Neither ground is convincing.

[91] Contrary to what the appellant claims, the CFIA had evidence before it about ostriches prior to promulgating the Stamping-Out Policy. The record supports that, although the CFIA may not have directly consulted with ostrich owners in developing that policy, it possessed evidence demonstrating that ostriches were susceptible to infection and could transmit the infection to other ostriches or various types of birds. This included published scientific research on the susceptibility of ostriches to avian influenza conducted in South Africa, where the appellant's flock reportedly originated. Susceptibility is the key criterion triggering the application of the Stamping-Out Policy: *FC Decision* at para. 102. Moreover, the appellant's situation and that of the ostriches were specifically considered by the CFIA before it issued the Exemption Decision: see *FC Decision* at paras. 239–240.

[92] The appellant claims the survival rate of ostriches compared to other poultry, such as chickens and turkeys, should have led to a different result in its case. We disagree. Section 48 of

the *Act* does not limit the Minister (or the CFIA, the ministerial delegate) to ordering the destruction of only infected animals. As noted in *Hunt*, *Jerram* and *Kohl*, the Minister may proceed with destruction on the basis of mere suspicion and may make destruction decisions through a general policy. Moreover, the imposition of the Stamping-Out Policy on ostriches is consistent with Canada's international trade obligations, which is a relevant consideration in developing a policy under section 48 of the *Act*: *Hunt* at para. 49; *Jerram* at 30.

[93] As concerns, more generally, the reasonableness of the Stamping-Out Policy, the Minister and CFIA are afforded very broad discretion under section 48 of the *Act*, which allows them to require destruction of animals based on mere suspicion of infection. The case law of this Court and the Federal Court, as noted, has recognized the breadth of that discretion and endorsed policies like the Stamping-Out Policy.

[94] Moreover, there was significant evidence before the CFIA, when it adopted the Stamping-Out Policy, about the risks of HPAI to domestic disease control, public health, and Canada's ability to export poultry to its international trading partners. This evidence amply supports the choice of stamping out as a reasonable response to those risks.

[95] More specifically, the CFIA possessed evidence that:

- stamping out effectively controls the spread of HPAI to other sites or species by stopping virus amplification, caused by the multiplication of the virus in infected

hosts and its excretion into the environment, thereby reducing opportunities for other susceptible animals to become exposed;

- decontamination, after the animals are removed from the site, also prevents the spread of the virus, which can survive for months in cold and moist environments;

- controlling the spread of HPAI preserves animal resources and reduces impacts on Canadians' food supply by reducing the number of birds infected by HPAI, which is important because HPAI outbreaks in chickens and turkeys may result in the death of large proportions of exposed flocks and require the culling of hundreds of thousands of birds;

- stamping out is recognized as the international standard for achieving domestic disease control of HPAI. In this regard, Canada is a member of the World Organization for Animal Health (WOAH), a science-based organization recognized by its 183 member states as the global authority on matters of animal health and by the World Trade Organization as the international standard setting organization for animal health and zoonoses (diseases transmissible from animals to humans). One of the WOAH's roles is to identify the most appropriate strategies and measures for disease prevention and control. The WOAH supports the implementation of a stamping out policy in response to HPAI outbreaks in poultry, including ostriches, and a majority of WOAH members recognize this policy as the international standard;

- stamping out responds to the risks posed by HPAI to public health since transmission of HPAI to humans, though rare, can occur, and close to half of the 900 or so human cases of avian influenza (H5N1) reported in the past few decades have been fatal; and

- stamping out effectively responds to the risks posed by HPAI to Canada's ability to export poultry to international trading partners. Trade agreements with the United States, Mexico, and the European Union require Canada to adhere to international animal health standards. Canada's most important trading partners, including the United States, recognize stamping out as the international standard disease response to HPAI. Under WOAH standards, countries who apply a stamping out policy in response to HPAI detections in poultry may regain disease-free status a minimum of 28 days after the stamping-out process is complete. Where such a policy is not implemented, disease-free status may be recognized only when there has been an absence of detection of HPAI in poultry for a minimum of 12 months. Before poultry exports can resume following an HPAI outbreak, importing countries require disease-free status at the level of the entire country or at the level of a province, depending on the importing country. In response to the current HPAI outbreak, Canada has, in compliance with WOAH standards, established HPAI control zones and can export poultry from outside of these control zones to trading partners who recognize Canada's zoning. Their recognition of zoning is based on their expectation that stamping out will be implemented in control zones according to WOAH standards. Canada's failure to apply the policy would put at risk recognition of its zoning by trading partners,

> jeopardize Canada's access to export markets for its poultry and poultry products and damage Canada's reputation as a country able to successfully control, contain and eliminate diseases in accordance with its international commitments.

[96] In light of this evidence, like the Federal Court, we conclude that the CFIA reasonably chose as its preferred measure the timely destruction of any type of bird that was both susceptible to HPAI and exposed to it: *FC Decision* at para. 102.

[97] Nor did the Stamping-Out Policy have to provide for additional testing or a more targeted approach to culling. The record put before this Court demonstrates that the CFIA considered but rejected at various points the possibility of a "burn out" strategy or more targeted responses to avian flu outbreaks: *FC Decision* at para. 167. That choice was supported by the risk to international trade and the scientific realities of how avian flu is transmitted, both of which are acceptable considerations under section 48 of the *Act*: see *Jerram* at 30; *Hunt* at paras. 49–51.

[98] In addition, it was reasonable for the Policy to provide for the culling of the entire flock without selective testing and despite the fact that part of the flock would not succumb to the illness. As explained, section 48 of the *Act* explicitly allows for destruction in the face of a mere suspicion of infection or exposure to suspected infection. The decisions in *Jerram*, *Hunt*, and *Kohl* all recognized this reality. This conclusion is also relevant to the appellant's emphasis on the fact that only two ostriches were tested. This argument also overlooks the fact that a significant number of ostriches died in the outbreak, in addition to the fact that the biosecurity measures maintained by the appellant on the premises at the time placed all ostriches under the

same risk of exposure to HPAI and that, as a result, the positive test result of just one bird subjected the entire flock to destruction without exception. In any event, the number of samples is irrelevant under the 2022 ERP: *FC Decision* at para. 155.

[99] Given that the Stamping-Out Policy is reasonable, we also find that the Notice to Dispose and Exemption Denial were reasonable. The inspector had to issue the Notice to Dispose once the criteria were met.

[100] From the reasons given and in light of the record, it is apparent that the Exemption Committee considered the health status of the flock, the biosecurity measures in place, and the importance of the flock to the appellant and its principals. After considering whether it could allow the appellant to keep a subset of the ostriches, the Committee determined that it was just too risky to undertake "selective culling" or otherwise allow the infection to "burn out" on the farm as the appellant proposed. It held as follows:

> While a significant policy deviation was considered (i.e. to employ selective culling of this HPAI infected non-commercial poultry premises, rather than stamping-out), internal consultation with other branches (ie. Science, International Affairs, Policy and Programs) highlighted the substantial risks in not adhering to current policy, including: the domestic disease control risks, the threat to public health, and the anticipated trade implications given our trading partners expectation that Canada adhere to a stamping-out policy. Maintaining a large population of outdoor birds infected with HPAI would delay Canada's ability to regain disease freedom status, with a minimum one-year delay from the closure of the last outbreak rather than 28 days associated with a stamping-out policy. Communications between [International Affairs Branch] and the United States Department of Agriculture (USDA) also clearly identified that the USDA has, and would continue to, apply a stamping out approach to the detection of HPAI in ostrich farms. The risk for further HPAI transmission to humans, other domestic livestock, and wildlife, in a large population of HPAI infected outdoor birds that

> may harbour subclinical infections was notable. (Exemption Committee Decision Record, CFIA Certified Tribunal Record at p. 312).

[101] Thus, we find that the Exemption Committee reasonably concluded that the flock did not qualify for exemption under any of the categories in the 2022 ERP and reasonably refused to pursue the alternatives proposed by the appellant.

IV. Disposition

[102] We accordingly dismiss this appeal, with costs, which we would fix in the agreed-upon all-inclusive amount of $7,000.00. We agree this is an appropriate figure given the issues and the need for counsel to travel to the expedited hearing in Ottawa.

"Mary J.L. Gleason"
J.A.

"René LeBlanc"
J.A.

"Gerald Heckman"
J.A.

FEDERAL COURT OF APPEAL

NAMES OF COUNSEL AND SOLICITORS OF RECORD

DOCKET:	A-205-25
STYLE OF CAUSE:	UNIVERSAL OSTRICH FARMS INC. v. CANADIAN FOOD INSPECTION AGENCY
PLACE OF HEARING:	OTTAWA, ONTARIO
DATE OF HEARING:	JULY 15, 2025
REASONS FOR JUDGMENT OF THE COURT BY:	GLEASON J.A. LEBLANC J.A. HECKMAN J.A.
DATED:	August 21, 2025

APPEARANCES:

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Aileen Jones Paul Saunders	FOR THE RESPONDENT

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Notice to industry – Scrapie Pilot Project: Assessing Genetic Resistance in Positive Goat Herds

August 13, 2025

The Canadian Food Inspection Agency (CFIA) is pleased to announce that we will proceed with the **Scrapie Pilot Project: Special Procedures for Assessing Genetic Resistance in Positive Goat Herds**. This is an alternate disease response option to total herd depopulation for scrapie infected goat herds that meet specific criteria.

Testing for genetic resistance in sheep has been a useful tool in scrapie management and eradication. The Canadian goat industry has shown support to better understand genetic resistance in goats, aiming to increase trade options and help producers eradicate scrapie. This pilot project aligns with international standards and marks a significant advancement by providing the goat industry with the same scrapie management tools that are currently available to the sheep industry.

Background

Further to the previous Notice to industry – Advancing eradication: genetic scrapie resistance in goats – inspection.canada.ca, we have completed the development and will proceed with a pilot project to assess the use of the scrapie genetic alleles **S146** and **K222** for goats in our National Scrapie Eradication Program (NSEP). This approach aligns with the practices of Canada's closest trading partners, the United States (U.S.) and the European Union (EU).

The distribution of scrapie genotypes in the global goat population appears to be more diverse than what is found in sheep. In accordance with World Organisation for Animals Health (WOAH) standards, countries or regions are encouraged to identify the scrapie genotypes present in their goat populations and assess the degree to which each genotype is considered susceptible to scrapie. Our goat genotyping pilot project will play a critical role in gathering this essential data for Canada.

How this applies to the goat industry

We recognize the importance of providing goat producers with an alternative to total herd depopulation in scrapie-positive herds. This approach aims to both preserve valuable genetics and protect the scrapie status of the national small ruminant herd as we continue efforts toward eradication.

Through this pilot project, producers with a confirmed scrapie-positive goat herd will have the option to apply for participation in the scrapie genotyping pilot project. If a herd qualifies, blood samples will then be collected to determine whether the genotypes being considered for resistance are present in their herd. Like the approach used in sheep, only animals with genotypes considered susceptible to scrapie would be ordered euthanized (with compensation) and tested. The remaining herd would be placed under quarantine and allowed to breed for resistance during the standard 5-year surveillance follow up period, under our close monitoring.

Once data is collected through this pilot project, we will be able to develop a reference table of scrapie-susceptible and resistant genotypes in goats, like what is available for sheep. These genotypes can then be incorporated into Canada's standard domestic disease response. In the long term, this information will also help facilitate market access for import and export of live goats and their germplasm, products and by-products, as Canada continues to work toward scrapie-free (negligible risk) status.

Goat herds participating in the pilot project would generally be ineligible for export until at least 5 to 7 years have passed since the last confirmed case of scrapie.

In addition to the pilot project, under the national scrapie surveillance system, we routinely offer producers free scrapie testing for any sheep or goats 12 months of age or older that die or are euthanized on farm. Any goats tested for scrapie at our laboratories can also be genotyped for scrapie resistance at the same time.

If you have questions or concerns, please contact scrapie@inspection.gc.ca

Date modified:
2025-08-13

CHAPTER 1.4.

ANIMAL HEALTH SURVEILLANCE

Article 1.4.1.

Introduction and objectives

1) In general, *surveillance* is aimed at demonstrating the absence of *infection* or *infestation*, determining the presence or distribution of *infection* or *infestation* or detecting as early as possible exotic diseases or *emerging diseases*. Animal health *surveillance* is a tool to monitor disease trends, to facilitate the control of *infection* or *infestation*, to provide data for use in *risk analysis*, for animal or public health purposes, to substantiate the rationale for *sanitary measures* and for providing assurances to trading partners. The type of *surveillance* applied depends on the objectives of the *surveillance*, the available data sources and the outputs needed to support decision-making. The general recommendations in this chapter may be applied to all *infections* or *infestations* and all susceptible species (including *wildlife*) and may be adapted to national or local settings. *Specific surveillance* is described in some *listed disease*-specific chapters.
2) *Wildlife* may be included in a *surveillance* system because they can serve as reservoirs of *infection* or *infestation* and as indicators of *risk* to humans and domestic *animals*. However, the presence of an *infection* or *infestation* in *wildlife* does not mean it is necessarily present in domestic *animals* in the same country or *zone*, or vice versa. *Surveillance* in *wildlife* presents challenges that may differ significantly from those in *surveillance* in domestic *animals*.
3) Prerequisites to enable a Member Country to provide information for the evaluation of its *animal health status* are:
    a) that the Member Country complies with the provisions of Chapters 3.2. to 3.4. on *Veterinary Services*;
    b) that, where possible, *surveillance* data be complemented by other sources of information, such as scientific publications, research data, *population* demographic data, animal production data, documented field observations and other data;
    c) that transparency in the planning, execution and results of *surveillance* activities, is in accordance with Chapter 1.1.
4) The objectives of this chapter are to:
    a) provide guidance on the design of a *surveillance* system and the type of output it should generate;
    b) provide recommendations to assess the quality of *surveillance* systems.

Article 1.4.2.

Definitions

For the purposes of this chapter the following definitions apply:

Bias means a tendency of an estimate to deviate in one direction from a true *population* parameter.

Confidence means the probability that the type of *surveillance* applied would detect the presence of *infection* or *infestation* if the *population* were infected and is equivalent to the sensitivity of the *surveillance*. Confidence depends on, among other parameters, the assumed prevalence of *infection* or *infestation*.

Probability sampling means a sampling strategy in which every *unit* is chosen at random and has a known non-zero probability of inclusion in the sample.

Sample means the group of elements (sampling *units*) drawn from a *population*, on which tests are performed or parameters measured to provide *surveillance* information.

Sampling unit means the *unit* that is sampled. This may be an individual *animal* or a group of *animals*, such as an *epidemiological unit*.

Sensitivity means the proportion of infected sampling *units* that are correctly identified as positive.

Specificity means the proportion of uninfected sampling *units* that are correctly identified as negative.

Study population means the *population* from which *surveillance* data are derived. This may be the same as the target *population* or a subset of it.

Surveillance system means the use of one or more *surveillance* components to generate information on the health status of animal *populations*.

Survey means a component of a *surveillance* system to systematically collect information with a predefined goal on a sample of a defined *population* group, within a defined period.

Target population means the *population* to which conclusions are to be inferred.

Test means a procedure used to classify a *unit* as either positive, negative or suspect with respect to an *infection* or *infestation*.

Article 1.4.3.

Surveillance systems

In designing, implementing and assessing a *surveillance* system, the following components should be addressed in addition to the quality of *Veterinary Services*.

1. Design of surveillance system

   a) Populations

   Surveillance should take into account all animal species susceptible to the *infection* or *infestation* in a country, *zone* or *compartment*. The *surveillance* activity may cover all individuals in the *population* or only some of them. When *surveillance* is conducted only on a *subpopulation*, inferences to the target *population* should be justified based on the epidemiology of the disease and the degree to which the *subpopulation* is representative of the target *population* stated.

   Definitions of appropriate *populations* should be based on the specific recommendations of the relevant chapters of the *Terrestrial Code*.

   b) Timing and temporal validity of surveillance data

   The timing, duration and frequency of *surveillance* should be determined taking into consideration factors such as:

   – objectives of the *surveillance*;
   – biology and epidemiology (e.g. pathogenesis, *vectors*, transmission pathways, seasonality);
   – *risk* of introduction and spread;
   – husbandry practices and production systems;
   – disease prevention and control measures (e.g. *vaccination*, restocking after *disinfection*);
   – accessibility of target *population*;
   – geographical factors;
   – environmental factors, including climate conditions.

   c) Case definition

   Where one exists, the *case* definition in the relevant chapter of the *Terrestrial Code* should be used. If the *Terrestrial Code* does not give a *case* definition, a *case* should be defined using clear criteria for each *infection* or *infestation* under *surveillance*. For *wildlife infection* or *infestation surveillance*, it is essential to correctly identify and report host animal taxonomy, including genus and species.

   d) Epidemiological unit

   The relevant *epidemiological unit* for the *surveillance* system should be defined. To meet the objective of *surveillance*, the sampling *unit* selected for testing should reflect the defined *epidemiological unit*.

   A group of *animals* may be considered an *epidemiological unit* because they share a common environment or because of common management. Usually, an *epidemiological unit* is a *herd* or a *flock*. However, it may also be a group of *animals* in a pen or a group of *animals* belonging to residents of a village, or a group of *animals* sharing a communal animal handling facility or, in some circumstances, a single *animal*. The epidemiological relationship may differ from disease to disease, or even strain to strain of the pathogenic agent.

   e) Clustering

   Infection or *infestation* in a country, *zone* or *compartment* usually clusters rather than being uniformly or randomly distributed through a *population*. Clustering may occur at a number of different levels (e.g. a cluster

of infected *animals* within a *herd* or *flock*, a cluster of pens in a building, or a cluster of farms in a *compartment*). Clustering should be taken into account in the design of *surveillance* activities and considered in the statistical analysis of *surveillance* data.

f) Diagnostic tests

Surveillance involves the use of tests for detection of *infection* or *infestation* according to appropriate *case* definitions. Tests used in *surveillance* may range from clinical observations and the analysis of production records to rapid field and detailed laboratory assays.

The performance of a test at the *population* level (including field observations) may be described in terms of its sensitivity, specificity and predictive values. These values together with prevalence will have an impact on the conclusions drawn from *surveillance* and should be taken into account in the design of *surveillance* systems and analysis of *surveillance* data.

Laboratory tests should be chosen in accordance with the relevant chapters of the *Terrestrial Manual*.

g) Analytical methodologies

Surveillance data should be analysed using appropriate methodologies and at the appropriate organisational level to facilitate effective decision-making, whether it be for planning disease control interventions or demonstrating health status.

Methodologies for the analysis of *surveillance* data should be flexible to deal with the complexity of real life situations. No single method is applicable in all cases. Different methodologies may be used to accommodate different host species, pathogenic agents, production systems and *surveillance* systems, and types and amounts of data and information available.

The methodology used should be based on the best data sources available. It should also be in accordance with this chapter, fully documented and, whenever possible, supported by reference to scientific literature and other sources, including expert opinion. Sophisticated mathematical or statistical analyses may be carried out only when justified by the objectives of the *surveillance* and the availability and quality of field data.

Consistency in the application of different methodologies should be encouraged. Transparency is essential in order to ensure objectivity and rationality, consistency in decision-making and ease of understanding. The uncertainties, assumptions made, and the effect of these on the final conclusions should be documented.

h) Scope of the surveillance system

When designing the *surveillance* system consideration should be given to the purposes of *surveillance* and how the information it generates will be used, the limitations of the information it will generate, including representativeness of the study *population* and potential sources of bias as well as the availability of financial, technical and human resources.

i) Follow up actions

The design of the *surveillance* system should include consideration of what actions will be taken on the basis of the information generated.

2. Implementation of the surveillance system

a) Diagnostic tests

The sensitivity and specificity values of the tests used should be specified for target species and the method used to estimate these values should be documented in accordance with the *Terrestrial Manual*.

Samples from a number of *animals* or *units* may be pooled and subjected to a testing protocol. The results should be interpreted using sensitivity and specificity values that have been determined or estimated for that particular pool size and testing procedure.

b) Data collection and management

The success of a *surveillance* system is dependent on a reliable process for data collection and management. The process may be based on paper or electronic records. Even where data are collected for non-survey purposes (e.g. during disease control interventions, inspections for movement control or during disease eradication schemes), the consistency and quality of data collection and event reporting in a format that facilitates analysis is critical. Software may offer the possibility of extraction of multiple source data for aggregation and analysis. Factors influencing the quality of collected data include:

- the distribution of, and communication between, those involved in generating and transferring data from the field to a centralised location; this requires effective collaboration among all stakeholders, such as government or non-governmental organisations, and others, particularly for data involving *wildlife*;
- the ability of the data processing system to detect missing, inconsistent or inaccurate data, and to address these problems;
- maintenance of raw data rather than the compilation of summary data;
- minimisation of transcription errors during data processing and communication.

3. Quality assurance

Surveillance systems should be subjected to periodic auditing to ensure that all components function and provide verifiable documentation of procedures and basic checks to detect deviations of procedures from those specified in the design, in order to implement appropriate corrective actions.

Article 1.4.4.

Surveillance methods

Surveillance systems routinely use data collected by probability-based or non-probability-based methods, either alone or in combination. A wide variety of *surveillance* sources may be available. These vary in their primary purpose and the type of *surveillance* information they are able to provide.

1. Disease reporting systems

Disease reporting systems are based on reporting of animal health-related events to the *Veterinary Authority*. Data derived from disease reporting systems can be used in combination with other data sources to substantiate claims of *animal health status*, to generate data for *risk analysis* or for early warning and response. Effective laboratory support is an important component of any reporting system. Reporting systems relying on laboratory confirmation of suspected clinical *cases* should use tests that have high specificity as described in the *Terrestrial Manual*.

Whenever the responsibility for disease reporting falls outside the scope of the *Veterinary Authority*, for example human cases of zoonotic diseases or *infections* or *infestations* in *wildlife*, effective communication and data sharing should be established between the *Veterinary Authority* and other relevant authorities.

Participatory *surveillance* methods may be useful to collect epidemiological data that can support disease reporting systems.

2. Surveys

In addition to the principles in Article 1.4.3., the following should be considered when planning, implementing and analysing surveys.

Surveys may be conducted on the entire target *population* (i.e. a census) or on a sample.

The sources of data should be fully described and should include a detailed description of the sampling strategy used for the selection of *units* for testing. Also, consideration should be given to any biases that may be inherent in the survey design.

a) Survey design

The target and study *populations* should first be clearly defined. Depending on the design of the survey, appropriate sampling *units* should be defined for each stage.

The design of the survey will depend on the knowledge of the size, structure and distribution of the *population*, the epidemiology of the *infection* or *infestation* and the resources available.

Data on the size, structure and distribution of *wildlife populations* often do not exist. However, they should be estimated to the extent possible before the survey is designed. Expert opinion can be sought in the gathering and interpretation of such *population* data. Historical *population* data should be updated since these may not reflect current *populations*.

b) Sampling

i) Objective

The objective of sampling from a *population* is to select a subset of *units* from the *population* of interest with respect to the objective of the study, taking into account practical constraints imposed by different

environments and production systems so that data from the study *population* can be extrapolated to the target *population*.

When selecting *units* from a target *population* to have a representative sample, probability-based sampling, such as a simple random selection, should be used.

Where probability-based sampling is not feasible, non-probability-based methods may be applied and should provide the best practical chance of generating a sample that can be considered as representative of the target *population*.

When the objective of non-probability-based sampling is to maximise the likelihood of detection of the *infection* or *infestation*, this type of sampling may not be representative of the target *population*.

When using non-probability-based sampling, representativeness can only be achieved if *risk* factors are weighted and the weights are supported by relevant scientific evidence capturing the relative differences in *risk* and proportion between the study *population* and the target *population*.

The sampling method used at all stages should be fully documented.

ii) Sample size

In surveys conducted to demonstrate the presence or absence of an *infection* or *infestation* the method used to calculate sample size depends on the size of the *population*, the design of the survey, the expected prevalence and possible clustering, the level of confidence desired of the survey results and the performance of the tests used.

In addition, for surveys designed to estimate a parameter (e.g. prevalence) consideration should be given to the desired precision of the estimate.

iii) Sample selection

- Probability-based sampling methods, such as:
  - simple random selection;
  - cluster sampling;
  - stratified sampling;
  - systematic sampling;
  - risk-based sampling.
- Non-probability-based sampling methods, depending on:
  - convenience;
  - expert choice;
  - quota;
  - *risk*.

3. Risk-based methods

Surveillance activities targeting selected *subpopulations* in which an *infection* or *infestation* is more likely to be introduced or found, or more likely to spread, or cause other consequences and contribute to early detection, freedom claims, disease control activities, and estimation of prevalence. Risk-based methods can be used for both probability-based and non-probability-based sampling methods and data collection. The effect of the selection (i.e. its impact on probability of detection) should be estimated.

Risk-based methods should be based on a *risk assessment* and are useful to optimise the use of *surveillance* resources.

4. Ante-mortem and post-mortem inspections

Inspection of *animals* at *slaughterhouses/abattoirs* may provide valuable *surveillance* data. The sensitivity and specificity of *slaughterhouse/abattoir* inspections for detecting the presence of specified diseases will be influenced by:

a) clinical and pathological signs;

b) the training, experience and number of the inspection staff;

c) the extent to which the *Competent Authority* is involved in the supervision of ante-mortem and post-mortem inspections, including reporting systems;

d) the quality of construction of the *slaughterhouse/abattoir*, speed of the slaughter chain, lighting quality, etc.; and

e) independence of the inspection staff.

Slaughterhouse/abattoir inspections are likely to provide good coverage for particular age groups and geographical areas only. *Slaughterhouse/abattoir surveillance* data may only be representative of a particular *subpopulation*

(e.g. only *animals* of a particular class and age are likely to be slaughtered for human consumption in significant numbers). Such limitations should be recognised when analysing *surveillance* data.

The usefulness of data generated by *slaughterhouse/abattoir* inspections is dependent on effective *animal traceability* that relates *animals* to their *herd* or *flock* or locality of origin.

Post-mortem inspection conducted in locations other than *slaughterhouses/abattoirs* (e.g. rendering plants, hunting places) may also provide valuable *surveillance* data.

5. Surveillance of sentinel units

Surveillance of sentinel *units* involve the identification and regular testing of one or more *animals* of known health or immune status in a specified geographical location to detect the occurrence of *infection* or *infestation*. Sentinel *units* provide the opportunity to target *surveillance* depending on the risk of introduction or re-emergence, likelihood of *infection* or *infestation*, cost and other practical constraints. Sentinel *units* may provide evidence of freedom from, or distribution of, disease, *infection* or *infestation*.

6. Clinical surveillance

Clinical observations of *animals* in the field are an important source of *surveillance* data. The sensitivity and specificity of clinical observations are highly dependent on the criteria used to define a suspected *case*. In order to allow comparison of data, the *case* definition should be standardised. Awareness and training of potential field observers, including *animal* keepers, in the application of the *case* definition and reporting are important. Ideally, both the number of positive observations and the total number of observations should be recorded.

7. Syndromic surveillance

Systematic analysis of health data, including morbidity and mortality rates, production records and other parameters can be used to generate signals that may be indicative of changes in the occurrence of *infection* or *infestation*.

8. Other useful data

a) Data generated by control programmes and health schemes

While focusing on the control or eradication of specific *infections* or *infestations*, control programmes or health schemes can be used to generate data that can contribute to other *surveillance* objectives.

b) Laboratory investigation records

Laboratory investigation records may provide useful data for *surveillance*, in particular for retrospective studies. Multiple sources of data such as national, accredited, university and private sector *laboratories* should be integrated in order to increase the coverage of the *surveillance* system.

Valid analysis of data from different *laboratories* depends on the existence of quality control and quality assurance systems, including standardised diagnostic procedures and standardised methods for data recording and interpretation as well as a mechanism to ensure the traceability of specimens to *herd* or *flock* or locality of origin.

c) Biological specimen banks

Specimen banks consist of stored specimens, gathered through representative sampling or opportunistic collection. Specimen banks may contribute to retrospective studies, including providing support for claims of historical freedom from disease, *infection* or *infestation*, and may allow certain studies to be conducted more quickly and at lower cost than other approaches.

d) Wildlife data

Specimens for *surveillance* from *wildlife* may be available from sources such as hunters and trappers, road-kills, *wild animal meat* markets, sanitary inspection of hunted *animals*, morbidity and mortality observations by the general public, *wildlife* rehabilitation centres, *wildlife* biologists and *wildlife* agency field personnel, farmers and other landholders, naturalists and conservationists. *Wildlife* data such as census data, trends over time, and reproductive success can be used in a manner similar to farm production records for epidemiological purposes.

e) Public health data

For zoonotic diseases public health data may be an indicator of a potential change in the *animal health status*. The *Veterinary Authority* should coordinate with human health authorities and share data for integration into *specific surveillance* systems.

f) Environmental data

Relevant environmental data such as rainfall, temperature, extreme climatic events, presence and abundance of potential *vectors* as described in Chapter 1.5., should also be integrated into the *surveillance* system.

g) Additional supporting data such as:

i) data on the epidemiology of the *infection* or *infestation*, including host *population* distribution;

ii) data on animal movements, including transhumance and natural *wildlife* migrations;

iii) trading patterns for *animals* and animal products;

iv) national animal health regulations, including information on compliance and effectiveness;

v) history of imports of potentially infected material;

vi) *biosecurity* in place; and

vii) the *risk* of introduction of *infection* or *infestation*.

9. Combination and interpretation of surveillance results

Depending on the objective of *surveillance*, the combination of multiple sources of data may provide an indication of the overall sensitivity of the system and may increase the confidence in the results. The methodology used to combine the evidence from multiple data sources should be scientifically valid, and fully documented, including references to published material.

Surveillance information gathered from the same country, *zone* or *compartment* at different times may provide cumulative evidence of *animal health status*. Repeated surveys may be analysed to provide a cumulative level of confidence. However, the combination of data collected over time from multiple sources may be able to achieve an equivalent level of confidence.

Analysis of *surveillance* information gathered intermittently or continuously over time should, where possible, incorporate the time of collection of the information to take the decreased value of older information into account. The sensitivity and specificity of tests used and completeness of data from each source should also be taken into account for the final overall confidence level estimation.

In assessing the efficiency of the *surveillance* system based on multiple sources, the *Veterinary Authority* should consider the relative contribution of each component to the overall sensitivity, while considering the primary objective of each *surveillance* component.

Results from animal health *surveillance* systems are subject to one or more potential biases. When assessing the results, care should be taken to identify potential biases that can inadvertently lead to an over-estimate or an under-estimate of the parameters of interest.

Article 1.4.5.

Early warning systems

An *early warning system* is essential for the timely detection, reporting and communication of occurrence, incursion or emergence of diseases, *infections* or *infestations* and is an integral component of emergency preparedness. It should be under the control of the *Veterinary Authority* and should include the following:

1) appropriate access to, and authority over, the target *animal populations* by the *Veterinary Services*;

2) access to *laboratories* capable of diagnosing and differentiating relevant *infections* or *infestations*;

3) training and awareness programmes for *veterinarians*, *veterinary paraprofessionals*, *animal* owners or keepers and others involved in handling *animals* at the farm or other places where they are kept during their transport or at the *slaughterhouse/abattoir*, for detecting and reporting unusual animal health incidents;

4) a legal obligation by *veterinarians* and other relevant stakeholders to report suspected *cases* or *cases* of *notifiable diseases* or *emerging diseases* to the *Veterinary Authority*, including the description of the findings;

5) epidemiological investigations of suspected *cases* and *cases* conducted by the *Veterinary Services* in order to confirm *cases* and to acquire accurate knowledge of the situation for further action.

All suspected *case* investigations should provide a result, either positive or negative. Criteria should be established in advance for a *case* definition. Confirmation can be made on clinical and post-mortem grounds, epidemiological information, laboratory test results or a combination of these, in accordance with relevant articles of the *Terrestrial Code* or *Terrestrial Manual*;

6) effective systems of communication between the *Veterinary Authority* and relevant stakeholders;

7) a national chain of command.

Article 1.4.6.

Surveillance for freedom from a disease, infection or infestation

1. Demonstration of freedom

A *surveillance* system to demonstrate freedom from a disease, *infection* and *infestation* should meet the following, in addition to the general principles outlined in Article 1.4.3. It should also take into account any prevention measures in place such as *vaccination* in accordance with this chapter and Chapter 4.18.

Freedom implies the absence of *infection* or *infestation* in an animal *population* in the country, *zone* or *compartment*. Scientific methods cannot provide absolute certainty of this absence. Therefore, demonstrating freedom, except for historical freedom, involves providing sufficient evidence to demonstrate to a desired level of confidence that *infection* or *infestation* with a specified pathogenic agent, if present, is present in less than a specified proportion of the *population*.

However, finding evidence of *infection* or *infestation* at any prevalence in the target *population* automatically invalidates any freedom claim unless otherwise stated in the relevant chapters of the *Terrestrial Code*.

It can be difficult to collect sufficient epidemiological data to demonstrate absence of *infection* or *infestation* in *wild animal populations*. In such circumstances, a range of supporting evidence should be used to make this assessment. The consequences of the presence of *infection* or *infestation* in *wildlife* in the same country or *zone* on the status of domestic *animals* should be assessed in each situation, as described in the relevant chapters of the *Terrestrial Code*.

Evidence from probability and non-probability risk-based data collection may increase the sensitivity of the *surveillance*.

2. Requirements to declare a country or a zone free from an infection or infestation

a) Prerequisites, unless otherwise specified in the relevant chapters of the *Terrestrial Code*:

   i) the *infection* or *infestation* has been a *notifiable disease*;

   ii) an *early warning system* has been in place for all relevant species;

   iii) measures to prevent the introduction of the *infection* or *infestation* have been in place: in particular, the importations or movements of *commodities* into the country or *zone* have been carried out in accordance with the relevant chapters of the *Terrestrial Code*;

   iv) the *infection* or *infestation* is not known to be established in *wildlife* within the country or *zone*.

b) Historical freedom

   Unless otherwise specified in the relevant chapter of the *Terrestrial Code*, a country or *zone* may be considered free without formally applying a pathogen-specific *surveillance* programme when:

   i) for at least the past 10 years:

      – no *vaccination* against the disease has been carried out;

      – the prerequisites listed in point (a) are complied with;

   ii) the pathogenic agent is likely to produce identifiable clinical or pathological signs in susceptible *animals*;

   iii) for at least 25 years there has been no occurrence of *infection* or *infestation*.

c) Where historical freedom cannot be demonstrated:

   i) A pathogen-specific *surveillance* programme has been applied as described in this chapter and in the relevant chapter of the *Terrestrial Code*, and has not detected any occurrence of the *infection* or *infestation*.

   ii) The prerequisites listed in point (a) have been complied with for at least as long as the pathogen-specific *surveillance* has been in place.

3. Requirements to declare a compartment free from infection or infestation

a) A pathogen-specific *surveillance* programme has been applied as described in this chapter and in the relevant chapter of the *Terrestrial Code*, and has not detected any occurrence of the *infection* or *infestation*.

b) The prerequisites listed in points 2(a)(i) to (iii) have been complied with for at least as long as the pathogen-specific *surveillance* has been in place.

4. Recommendations for the maintenance of freedom from a disease, infection or infestation

Unless otherwise specified in the relevant chapter of the *Terrestrial Code*, a country or *zone* that has achieved freedom in accordance with the provisions of the *Terrestrial Code* may maintain its free status provided that:

a) the *infection* or *infestation* is a *notifiable disease*;

b) an *early warning system* is in place for all relevant species;

c) measures to prevent the introduction of the *infection* or *infestation* are in place;

d) *surveillance* adapted to the likelihood of occurrence of *infection* or *infestation* is carried out. *Specific surveillance* may not need to be carried out if supported by a *risk assessment* addressing all identified pathways for introduction of the pathogenic agent and provided the pathogenic agent is likely to produce identifiable clinical or pathological signs in susceptible *animals*;

e) the *infection* or *infestation* is not known to be established in *wildlife*.

Article 1.4.7.

Surveillance in support of disease control programmes

Surveillance is an important component in disease control programmes and can be used to determine the distribution and occurrence of *infection* or *infestation* or of other relevant health-related events. It can be used to assess progress and aid in decision-making in the control or eradication of selected *infections* or *infestations*.

Surveillance used to assess progress in control or eradication of selected *infections* or *infestations* should be designed to collect data about a number of variables such as:

1) prevalence or incidence of *infection* or *infestation*;
2) morbidity and mortality;
3) frequency of *risk* factors and their quantification;
4) frequency distribution of results of the laboratory tests;
5) post-vaccination monitoring results;
6) frequency distribution of *infection* or *infestation* in *wildlife*.

The spatial and temporal distribution of these variables and other data such as *wildlife*, public health and environmental data as described in point 8 of Article 1.4.4. can be useful in the assessment of disease control programmes.

NB: FIRST ADOPTED IN 2005; MOST RECENT UPDATE ADOPTED IN 2021.

TRAINING MANUAL ON SURVEILLANCE AND INTERNATIONAL REPORTING OF DISEASES IN WILD ANIMALS

Second Cycle

Workshop for OIE National Focal Points for Wildlife

WORLD ORGANISATION FOR ANIMAL HEALTH
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TRAINING MANUAL ON SURVEILLANCE AND INTERNATIONAL REPORTING OF DISEASES IN WILD ANIMALS

Workshop for OIE National Focal Points for Wildlife

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ACKNOWLEDGEMENTS

The OIE would especially like to thank Dr F.A. Leighton and Dr Jane Parmley from the Canadian Wildlife Health Cooperative (CWHC, OIE Collaborating Centre for Research, Diagnosis and Surveillance of Wildlife Pathogens) for their very valuable work on this publication.

The OIE is very grateful for the way in which the CWHC was involved in the workshops and for their contribution to the development of this publication.

The OIE would like also to thank the following persons that participated in presenting to OIE National Focal Points workshops and refining the workbook:

Dr Sylvain Larrat – CWHC/Université de Montreal

Dr Raphael Vanderstichel – University of Prince Edward Island

Prof. Marc Artois – VetAgro Sup -Campus Vétérinaire de Lyon

Dr Maria Forzan – CWHC/University of Prince Edward Island

Dr Javier Sanchez - University of Prince Edward Island

Dr Marcela Uhart – School of Veterinary Medicine, University of California, Davies

Dr Jonathan Sleeman – National Wildlife Health Centre, United States Geological Survey (USGS), United States (US) Department of Interior

Dr Asha Perera – University of Saskatchewan

Dr Dan Walsh – National Wildlife Health Centre, USGS, US Department of Interior

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FOREWORD

Dr Bernard Vallat
Director General of the OIE

In 2009, the OIE launched a global programme of capacity building for OIE Delegates and OIE National Focal Points of the 180 Member Countries. The aim of this programme is to provide good governance concepts for the improvement of animal health, animal welfare and the safety of food products of animal origin at the national level, to explain and clarify the roles and responsibilities of the OIE National Delegates and Focal Points in this domain and to facilitate, when possible, consistency and harmonisation amongst OIE Member Countries when assigning responsibilities to these officials.

The first OIE Training Workshop for OIE National Focal Points on Wildlife, held in all OIE Regions in 2009-2010, provided an overview of the importance of pathogens and diseases in wild animals to domestic animal health, to trade in animals and animal products, to human health and to wild animal populations themselves, which have very high economic, social and cultural value. A Training Manual covering the topics of the first workshop is now available on the OIE website[1].

A second OIE Training Workshop for OIE National Focal Points on Wildlife was organised in all OIE Regions during 2011-2012. It provided practical information and exercises to help Member Countries to design surveillance programmes for pathogens and diseases in wild animals, including both general and targeted surveillance, diagnostic test performance and evaluation, data interpretation, survey design and sample size calculation for different purposes.

This Training Manual covers the topics of this second workshop and provides material that can be further used for training purposes at national and international levels.

I would like to sincerely thank Dr F.A. Leighton and Dr Jane Parmley from the Canadian Wildlife Health Cooperative (OIE Collaborating Centre for Research, Diagnosis and Surveillance of Wildlife Pathogens), who developed this Training Manual and contributed with other wildlife experts to the success and effectiveness of the second cycle of this OIE training objectives.

[1] http://www.oie.int/en/international-standard-setting/specialists-commissions-groups/working-groups-reports/working-group-on-wildlife-diseases/

Introduction

The purpose of this Workbook is to provide OIE National Focal Points on Wildlife with some practical knowledge and skills associated with surveillance for, and reporting of, diseases and pathogens in wild animals.

A fundamental responsibility of each Focal Point on Wildlife is to gather information about the occurrence of pathogens and diseases in wild animals in his or her country, to assemble this information for the OIE Delegate and others in the country, and to assist the Delegate to report to the OIE on those occurrences when they meet the criteria established for reporting.

Disease surveillance is the process by which information about the occurrence of pathogens and diseases in a country is obtained. Thus, it is important that focal points for wildlife understand the process of pathogen and disease surveillance, and also understand the strengths and weaknesses of the information derived from surveillance. In this workbook, the various components of surveillance are presented and exercises are included to practice evaluating surveillance data, to identify within surveillance data the pathogens and disease events that must be reported internationally, , to consider the choice and performance of diagnostic tests, to practice estimating the number of samples required in targeted surveillance programs, and to gain experience calculating prevalence from surveillance data. More information about different types of surveillance systems and surveillance data is available in the OIE Guide to Terrestrial Animal Health Surveillance[2].

The Workbook is divided into two main sections, one on General Wildlife Disease Surveillance (sometimes called "passive" surveillance), and the other on Targeted Wildlife Disease Surveillance (sometimes called "active" surveillance). Both of these sections contain exercises that support the material presented. To complete the exercises, 4 datasets are available: 2 for general surveillance and 2 for targeted surveillance. These datasets are available as separate Microsoft Excel (2007) files. At the end of the workbook, there are 5 appendices: in Appendix A, the fictitious country of Atlantis is described; in Appendix B, charts and maps derived from the general surveillance datasets are shown; in Appendix C, the OIE listed and non-listed diseases are provided; in

[2] available at: http://web.oie.int/boutique/index.php?page=ficprod&id_produit=1418&PHPSESSID=20f118ecd4851daa92e7ccf8bc20ad36&lang=en

Appendix D, charts and maps derived from the targeted surveillance datasets are shown; and in Appendix E, appropriate responses to the exercises included in the General and Targeted Wildlife Disease Surveillance sections are provided.

Pathogen Surveillance or Disease Surveillance?

The term "disease" surveillance often is used in a very general way to mean surveillance activities to identify actual clinical disease or death in animals and to identify the causes of such disease and death. The same term often is used to refer to surveillance programs, such as serological surveys, in which evidence is gathered about the presence of a particular pathogen in a population of animals, but the animals themselves may be healthy when they are sampled. In this second example, no disease is detected; only the pathogen is detected. Thus, when one speaks of "wildlife disease surveillance", it is important to clarify whether the surveillance program is designed to detect actual disease and death, and their causes (disease surveillance), or only to determine whether or not a particular pathogen may be present even if it is not causing clinical disease in the species or population of interest (pathogen surveillance).

Introduction to the World Organisation for Animal Health (OIE)

An **overview of the OIE**, its organisation, mission and history, is available on the OIE website at http://www.oie.int/fileadmin/vademecum/OIE_A-Z_2015.html.

The **responsibilities of OIE National Focal Points for Wildlife** to their OIE Delegates are outlined in their Terms of Reference, as follow:

1. To establish a network of wildlife experts within his/her country or to communicate with the existing network;

2. To establish and maintain a dialogue with the Competent Authority for wildlife in his/her country, and to facilitate cooperation and communication among several authorities where responsibility is shared;

3. To support the optimal collection and submission of wildlife disease information to the OIE through WAHIS;

4. To act as a contact point with the OIE Animal Health Information Department and the Scientific and Technical Department on matters related to information on wildlife including wildlife diseases;

5. To receive from the OIE Headquarters

   – copies of the reports of the Working Group on Wildlife
   – selected reports of the Scientific Commission for Animal Diseases
   – other relevant reports on wildlife or related to the livestock–wildlife interface,

   and to conduct the in-country consultation process on such draft texts and of drafts of proposed changes to OIE Standards dealing with wildlife diseases;

6. To prepare comments for the Delegate

   • on relevant meeting reports
   • on the proposals for new OIE standards and guidelines related to wildlife
   • reflecting the scientific view and position of the individual OIE Member Country and/or the Region.

Recommendations from the **OIE Global Conference on Wildlife** – February 2011

The OIE Global Conference on Wildlife: Animal Health and Diversity-Preparing the Future took place in February 2011, in Paris (France). Over 400 people with relevant expertise and experience met there to review and discuss issues in animal health and biodiversity. At the conclusion of this 3-day conference, the participants made the following recommendations to the OIE as an organisation and to each of the Member Countries of the OIE. Several recommendations of particular relevance to the roles of focal points for wildlife are highlighted below in bold type.

CONSIDERING:

1. The emergence and re-emergence of diseases that are transmissible among wildlife, domestic animals and humans,

2. The societal, economic and ecological value of diverse and healthy wildlife populations,

3. The key contribution of biodiversity and ecosystems services to health and the need to encourage research and expand knowledge on its interactions,

4. The need to increase the capacity of all countries worldwide to conduct surveillance, early detection, and initiate appropriate response to outbreaks and spread of diseases in wildlife,

5. The fundamental responsibilities of Veterinary Services and their government partners to protect and improve animal health, including aspects related to wildlife and biodiversity,

6. That the OIE is continuously developing and updating standards and trade facilitating mechanisms such as disease free zoning, compartmentalisation and safe trade in animal origin commodities to harmonise national regulation contributing to address the ecosystem interface between wildlife and domestic species,

7. That organisations internationally and nationally responsible for the delivery of public health, veterinary services, wildlife and the environment may be accommodated in different institutional units,

8. The increased need for animal protein for growing populations worldwide,

9. The changes in land use and management that may lead to new or modified interfaces between humans, domestic animals and wildlife that could favour disease transmission and loss of biodiversity,

10. The need for a multidisciplinary commitment and cooperation by stakeholders including public and non-governmental organisations to achieve mutually beneficial outcomes within the wildlife/domestic animal and human ecosystem interface.

THE PARTICIPANTS OF THE OIE GLOBAL CONFERENCE ON WILDLIFE RECOMMEND TO THE OIE:

1. To continue developing science-based standards on disease detection, prevention, and control as well as safe trade measures to harmonise the policies related to disease risks at the interfaces between wildlife, domestic animals, and humans.

2. To continue supporting and updating the notification mechanisms of wildlife diseases through the global information systems OIE WAHIS and *WAHIS-Wild*, while carefully considering possible impact of such notification by Members on the trade in domestic animals and their products, and to further promote data sharing at the international level on the GLEWS platform.

3. To assist Members to strengthen their Veterinary Services to protect animal health including aspects related to wildlife and biodiversity using, if needed, the OIE PVS Pathway.

4. **To encourage OIE Delegates to utilise their OIE focal points for wildlife to identify needs for national capacity building.**

5. To support Members' ability to access and utilise appropriate sampling and diagnostic expertise, as well as validated tools for disease surveillance and management in domestic and wild animals.

6. To encourage research to expand the scientific basis for the protection of biodiversity and environment to promote animal health and public health.

7. To encourage systematic inclusion, in the curriculum for veterinary education, of the promotion, the protection and the improvement of animal health and animal welfare including aspects related to wildlife and biodiversity.

8. To explore opportunities for communication and establishing strong collaboration with relevant global public and private organisations working on wildlife and biodiversity such as FAO, WHO, UNEP, IUCN, CIC, CITES[3] and other relevant Multilateral Environmental Agreements and international organisations to strengthen support to existing regulations on trade in wildlife and wildlife products and advocate for the need for mobilisation of resources in this area.

9. To continue to develop and update OIE strategies and policies on wildlife and biodiversity through the work of the Scientific Commission and its Working Group on Wildlife Diseases as well as the network of OIE Reference Laboratories and Collaborating Centres.

RECOMMEND TO OIE MEMBERS:

10. To continue to implement international standards and guidelines on prevention and control of diseases including those transmissible among wildlife, domestic animals and humans.

11. To continue to implement international standards and guidelines to facilitate the acceptable, legal trade of wildlife animals and wildlife products and to help reducing the illegal trade in wildlife.

12. **To notify diseases in wildlife through WAHIS and *WAHIS-Wild*, including in quarantine facilities, while carefully acknowledging when the notifications should not impact on trade of domestic animals and their products with commercial partners according to the OIE standards on relevant diseases.**

[3] Food and Agriculture Organization of the United Nations, World Health Organization, United Nations Environment Program, International Union for Conservation of Nature, International Council for Game and Wildlife Conservation and Convention on International Trade in Endangered Species of Wild Fauna and Flora

13. To ensure that the national Veterinary Services and their partners fulfil their responsibilities on aspects of biodiversity conservation, animal health and animal welfare as they relate to wildlife and the environment, including appropriate legislation and regulation, and, where needed, seek assistance through the OIE PVS Pathway to improve their services.

14. **To nominate and support national OIE Focal Points for Wildlife in their tasks and encourage their collaboration with partner agencies and organizations.**

15. To seek and apply appropriate sampling and diagnostic expertise and validated disease management tools for wildlife diseases, including with the participation of private veterinarians, medical doctors, community workers, fishermen, hunters, rangers, and other stakeholders.

16. To support relevant research to expand the scientific basis for the protection of biodiversity and environment to promote animal health as well as public health.

17. To support systematic inclusion, in the curriculum for veterinary education, of the promotion, the protection and the improvement of animal health and animal welfare including aspects related to wildlife and biodiversity.

18. To encourage public and private components of Veterinary Services to play an active role in promoting biodiversity and protecting wildlife.

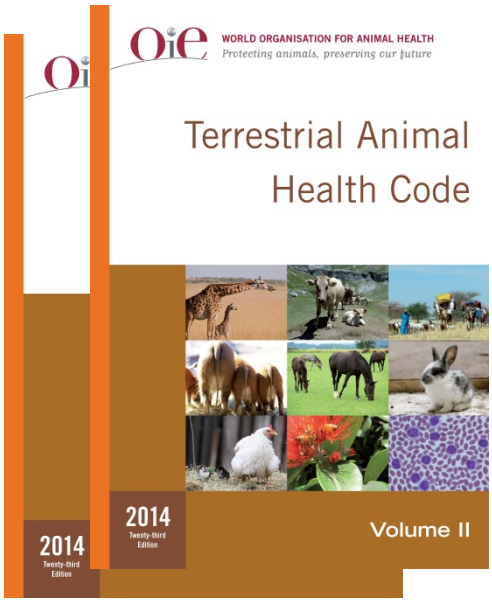
19. **To foster effective communication and collaboration at the national and regional level between different governmental agencies that share responsibilities for the environment and the health of wildlife, livestock and the public.**

20. **To explore and promote opportunities for communication, collaboration and partnerships with relevant public and private organisations having an interest in wildlife management and biodiversity including the tourism industry, private veterinarians and medical doctors, natural park and zoo managers, rangers, hunters, fishermen, conservation associations and local indigenous communities and stakeholders.**

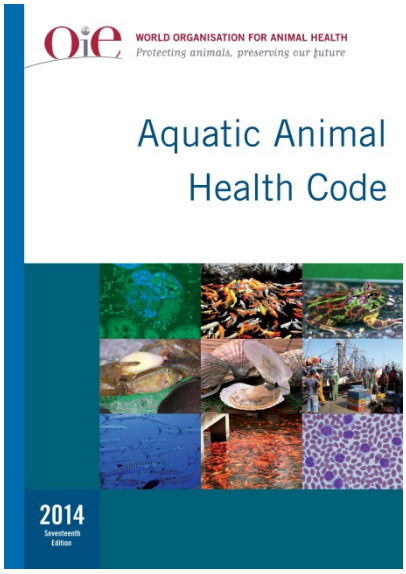
21. To promote the adoption of legislation to clarify or define ownership of wildlife by people and organisations.

OIE Terrestrial and Aquatic Animal Health Codes

These publications of the OIE provide fundamental information about surveillance and reporting of diseases to the OIE, and are important resources.



http://www.oie.int/en/international-standard-setting/terrestrial-code/access-online/



http://www.oie.int/international-standard-setting/aquatic-code/access-online/

General Wildlife Disease Surveillance

Introduction to General Wildlife Disease Surveillance

Definition and Purpose

Definition: General wildlife disease surveillance is a form of surveillance that identifies sick or dead wild animals in their native habitat and determines the causes of the illness and death. It is based on the diagnostic examination of wild animals found sick or dead in the wild. It is called "general" disease surveillance because the program includes a wide range of animal species and all causes of disease or death. It is not restricted to only one or a few species, or to only one or a few pathogens. Typically, national programs of general wildlife disease surveillance include all species of vertebrates (mammals, birds, reptiles, amphibians and fish), but some may also include some groups of invertebrates or there may be separate surveillance programs for terrestrial and for aquatic wild animal species.

There are many "official" definitions of "surveillance" and "monitoring" that overlap and differ in small ways. A common theme among these definitions is the concept that surveillance and monitoring are *on-going, continuous activities* and that the *information obtained* from these activities *is used in some way*, usually to help countries formulate their public policies and programs regarding animal and human health.

Definitions of "wildlife" also vary. Under different circumstances, different groups of animals may be considered "wildlife." This point is discussed from an OIE perspective on Page 4 of the OIE *Training Manual on Wildlife Diseases and Surveillance*, which is the training manual for Cycle One of this series of workshops and is available from the OIE Headquarters, Scientific and Technical Department, in English, French and Spanish.

The Purpose of General Wildlife Disease Surveillance: A surveillance program must always have a purpose, a reason why it is being done. Disease surveillance is difficult, time-consuming and expensive. It is undertaken because the information provided by surveillance is needed for one or more purposes. No disease surveillance program should be designed and initiated until its purpose is defined, because the purpose of the program will affect the design of the program in important ways.

Most often, national programs of general wildlife disease surveillance are undertaken for the following reasons:

- To learn what pathogens and diseases are present in wild animal populations in a country, their host species and their geographic distribution, including pathogens and diseases important to domestic animals, to public health and to wild animal populations themselves.
    - This information is an essential component of a country's capacity to manage animal and human health
- To detect new pathogens and diseases, or unusual epidemiological events that may indicate an emerging disease, as early as possible.
    - General disease surveillance can detect new, unusual or emerging pathogens and diseases while targeted surveillance detects only one or a small number of pathogens already known to exist.

- General disease surveillance is required in order for a country to be vigilant for emerging infectious diseases, many of which originate in wild animals.
- Early detection of new disease events permits an early management response to the event that is more likely to be successful, and likely to cost much less, than is the case when the disease event is detected later.

- To detect changes in patterns of disease occurrence over time.
  - General disease surveillance documents the current conditions of disease occurrence and distribution in a country, and provides a mechanism to detect changes in these conditions that may signal important changes in epidemiology and risk. Such risks can then be evaluated and responses made, if deemed necessary.

The Components of General Wildlife Disease Surveillance

Disease surveillance, whether general or targeted, consists of four very different activities, each one carried out by different groups of people and each one linked to the others to form a complete surveillance program.

- Detection of Pathogens and Diseases
- Identification of Pathogens and Diseases (diagnosis)
- Information Management
- Analysis and Communication

Disease surveillance thus depends most importantly on a network of people who know their capacities and responsibilities within the surveillance system and who communicate with each other easily and regularly.

Disease Surveillance in Wild Animals compared with Domestic Animals

Some aspects of disease surveillance in wild animals are the same or similar to disease surveillance in domestic animals. However, there also are important differences.

- Wild animals have no owners or attending veterinarians to recognize illness.
- The routine diagnostic tests for pathogens and diseases developed for domestic animals may or may not be valid for wild animal species. (This topic will be covered in greater depth later in the workbook)
- Wildlife biologists and ecologist are needed to provide data on populations and other aspects of wildlife biology and to analyse, interpret and communicate the results for a wildlife disease surveillance program.

Developing a Wildlife Disease Surveillance Program

To develop a surveillance program for pathogens and diseases in wild animals, it is necessary to establish the network of people and institutions needed to make the program function. This is one of the main tasks of OIE Focal Points for wildlife. The details of how best to do this will vary from country to country, but the general approach taken is likely to be similar among different countries.

Developing a Wildlife Disease Surveillance **Network**

We are briefly going to consider what kind of a network of people and institutions is needed for a general wildlife disease surveillance program in a country.

Step 1: Who can Detect Sickness or Death in Wild Animals?

The answer is "Anyone and everyone who observes wild animals or spends time in wild animal habitats." A wildlife disease surveillance program must recruit as many of these people as possible to participate in the program, to look for sick or dead wild animals and immediately to notify the coordinators of the surveillance program when they observe or find something.

The Objectives of *Detection of diseased wildlife*:

- To detect and record occurrences of death and disease in wild animals
- To obtain specimens of dead and diseased wildlife
- To preserve specimens for laboratory examination
- To transport those specimens to a diagnostic laboratory

Who can participate in Detection?

Network for Detection of Disease in Wildlife

Government Agency Staff	Non-government People
- Wildlife	- Hunters and trappers
- Environment	- Fish harvesters
- Fisheries	- Farm workers
- Forests	- Tourist guides
- Tourism	- Naturalist groups
- Agriculture	- Conservation organizations
- Nature parks and reserves	- University staff
- Pest control	- Private wildlife parks
- Border control	- Wildlife commodity merchants
- Military	- Industry:
- Veterinary service	- Forestry
- Public health	- Mining
- Economic development	- Fossil fuel
- Transportation	- Transport
- Regional/municipal government	- The General Public
- Aboriginal governments	

Note that the entire disease surveillance program depends on this first component: detection of dead and diseased wild animals. If this component is not working well and achieving its objectives, the surveillance program as a whole also will not achieve its objectives. This component also can be very challenging to organize and maintain. Considerable time, effort and resources will be required to achieve this component of wildlife disease surveillance.

When considering who can participate in disease detection, think about how the different groups and individuals may be involved. For example, will they collect and submit dead animals or do they simply have knowledge about how to report animals found dead?

Step 2: Who can Identify Pathogens and Diseases in Wild Animals?

People in the Field

Sometimes, it is possible for people in the field to correctly identify the disease they observe in wildlife.

- Some diseases can be identified by an animal's appearance, such as mange.
- Others have very characteristic lesions seen during autopsies that some field personnel may be competent to conduct.

People in Diagnostic Laboratories

Most of the time, *field identification is, at best, a tentative identification* and reliable identification of pathogens and diseases requires examination and testing of specimens in a diagnostic laboratory and, if needed, confirmation by a Reference Centre.

What laboratories might be able to do this in a country?

Potential Diagnostic Laboratories for Wildlife Pathogens and Diseases

- Government Veterinary Diagnostic Laboratories
- Veterinary Faculty/University Diagnostic Laboratories
- Private Veterinary Diagnostic Laboratories
- Government Medical Laboratories
- Private Medical Laboratories
- University Research Laboratories
- Hospital Laboratories
- Military Medical or Veterinary Laboratories
- International/Regional Laboratories
    - Veterinary & Medical Laboratories in Neighbouring Countries
    - OIE Reference Laboratories
    - OIE Collaborating Centres
    - FAO Reference Laboratories
    - WHO Reference Laboratories
    - NGO-affiliated Laboratories

- Countries will differ as to which kinds of laboratories can be recruited to participate in a wildlife disease surveillance program.

- Rarely will a country have the resources to support a diagnostic laboratory exclusively for wild animal diseases. Wildlife disease identification most often will be done in laboratories established for veterinary or medical diagnosis.

Important role of Anatomic Pathology (autopsy and histology) in General Disease Surveillance

Autopsy and subsequent microscopic examination of tissues (histology) plays an especially important role in general disease surveillance. In general disease surveillance, all causes of all illness and death detected in wild animals are to be identified, if possible. The evaluation of organs and tissues at autopsy and subsequent histology are the main criteria for choosing what additional diagnostic tests need to be carried out, such as bacterial culture, PCR for certain pathogens or toxicological tests. Autopsy (necropsy) and histology are especially important for the identification of new or unexpected pathogens and diseases.

Thus, it is particularly important that a country have, or develop, adequate expertise and capacity in veterinary anatomical pathology that can be applied in its general wildlife disease surveillance program. It is not possible to achieve the usual objectives of a national general wildlife disease surveillance program without this capacity and competence in diagnostic anatomical pathology.

Step 3: Information Management

A disease surveillance program must have a system to record the information it generates about disease or pathogen occurrences so that the information can be used to achieve the objectives of the surveillance program. The most suitable approach to management of surveillance information is some form of computerised database or archive of surveillance data. While it is possible, initially, to manage such information with spreadsheets or database software available for personal computers, such software quickly becomes inadequate as the amount of data increases. Thus, it is better to **recruit to the wildlife disease surveillance program people with the required knowledge and skills in computer database design and management.**

Who can undertake disease surveillance information management?

Potential Sources of Information Management Expertise

- Government Information Management Systems:
  - Veterinary Services
  - Public Health
  - Wildlife
  - Environment
- Universities – Computer Science, Epidemiology
- Private companies
- International sources - for example*:
  - Canadian Wildlife Health Cooperative**
  - Wildlife Conservation Society
  - US National Wildlife Health Center**
  - Australian Registry of Wildlife Health

* These organizations have wildlife disease information management systems that can serve as models for system design by a country for its own surveillance information, or which may be available for direct use.

** OIE Collaborating Centre

Step 4: Analysis and Communication

To achieve the objectives of a disease surveillance program, the information acquired through detection of dead or sick animals and identification of their pathogens and diseases must be reviewed, analysed in various ways and communicated within the country and internationally.

Who will do the analysis and communication?

National veterinary services often employ people skilled in epidemiological analysis and also in communication, and who carry out similar work with respect to disease surveillance in domestic animals. However, for wildlife diseases, both analysis and communication nearly always require additional analytical expertise and have additional audiences requiring communications.

- Wildlife biologists and ecologists are required to properly analyse wildlife disease occurrence data.

- All of the participants in the wildlife disease surveillance program, including government and non-government groups, expect to receive the results of the surveillance program through various communications from the program coordinators.

Wildlife Disease Surveillance

Expertise Required for Analysis*

- Veterinary Medicine
- Epidemiology
- Wildlife Biology and Ecology
- Public Health

Audiences for Communications**

- Veterinary Services
- Public Health
- Wildlife and Environment
- ALL other surveillance program participants***
- OIE and other international organizations, as required

* Wildlife disease surveillance analysis needs input from a wide range of experts

** Wildlife disease surveillance information is needed by a wide range of agencies and groups.

*** People who participate in the surveillance program will expect to receive information about the results of their work. If they do not receive this kind of information, they may lose interest in participating in the program.

Making Surveillance Work – The Key Role of the Coordinator

The four components of a disease surveillance program must be closely and constantly coordinated. **It is coordination that turns these four independent components into surveillance.** Coordination of the program is challenging, full-time work for a small number of people. Their job is to ensure that all components of the program operate in a manner that achieves the objectives established for the surveillance program.

Who will coordinate a wildlife disease surveillance program?

Wildlife disease surveillance is challenging to coordinate for the following reasons:

- In nearly all countries, responsibility for wildlife health and disease management is poorly defined, and the responsibility is shared, uncertainly, by several different branches of government including wildlife, environment, public health, agriculture, veterinary services, tourism, economics, border services and international relations. Thus, no one branch or agency of government has unique authority over wildlife disease issues, and it is not clearly the responsibility of any one agency to coordinate wildlife disease surveillance.

- Wildlife disease surveillance requires a larger, and a different, network of people than do disease surveillance programs for people and domestic animals. Thus, organizational models for the coordination and operation of other disease surveillance programs may not work well for wildlife disease surveillance.

- Wildlife biologists and ecologists are essential participants in wildlife disease surveillance. Government agencies such as veterinary services and public health, which are familiar with their own forms of disease surveillance, often have no traditions or experience working with agencies responsible for wildlife and the environment where biological and ecological expertise is to be found.

- Non-government organizations, universities and other groups outside of government often are critically important participants in wildlife disease surveillance and the coordinator must understand and work closely with such groups as well as with government agencies.

There are several different ways in which coordination of wildlife disease surveillance can be organized. A few examples are given below.

1. Coordination by one government agency. It is common for a government agency that needs wildlife disease surveillance information, or is responsible for other aspects of animal health, to feel it must or should undertake coordination of the national wildlife disease surveillance program. This can work well, providing the coordinator is given the flexibility required to engage all of the different government and non-government groups needed for an effective program. Several countries have excellent surveillance programs based on this approach.

2. Coordination by a coalition of government agencies which manage the program together through a written agreement. This has the advantage that the surveillance program is not considered to be owned by a single agency, and other government agencies may be more willing to support the program.

3. Coordination by a non-government organization. This model facilitates the collaboration among government agencies from different ministries and among government and non-government participants in the surveillance program. Resources for the program can be pooled and managed by the coordinator, and the program is carried out under the authority of the participating government agencies, which also play an oversight and governance role.

No matter how or by whom coordination of wildlife disease surveillance is organized in a country, the OIE focal point for wildlife will want to play a key role in assuring and facilitating effective coordination.

Data Required for General Wildlife Disease Surveillance

What data should be collected in a program of general wildlife disease surveillance?

It is critically important to carefully consider and decide well before the surveillance program is initiated what data will be recorded, entered into the program database, analysed and used. It is a common impulse to try to capture too much data because there is so much that can be recorded. When planning a surveillance program, it is common that planners identify many, many pieces of information that could be recorded for each occurrence of wildlife disease detected, and which might be useful in some way.

In practice, however, attempts to collect very large amounts of information systematically for each disease occurrence often fail. The recording and entry into computers of data require a lot of time and effort. The personnel time required to record large amounts of information often is not available, and very soon the recording process breaks down, records become partial and incomplete, and some critically important data go unrecorded.

- Recording of data and entry into computer systems takes time and effort (resources)
- This can easily become too much work, that cannot be done sustainably
- The whole system fails if you try to record too much data

Thus, most often, the best practice is to define the minimum amount of information that is needed to achieve the objectives of the surveillance program, and to ensure that at least these data are always recorded and made part of the permanent record for every disease occurrence.

Minimum Essential Data to be Recorded

Data about the Incident (the disease occurrence event)

1. Unique Number to identify the disease Incident or Occurrence (An incident usually is defined as one or more sick and dead animals found at one location, on one day or very close together in time)
2. Date on which the incident occurred or was discovered
3. Geographic Location: Latitude and Longitude
4. Number of animals dead
5. Number of animals sick
6 Number of animals examined or submitted to a laboratory for diagnosis/disease identification

Data about the Animals in the Incident (Specimen data)
(For each animal examined or sampled)

1. Unique specimen number for each
2. Species of animal – Latin Name (*Genus species*)
3. Species of animal – Common Name
4. Laboratory Accession Number (if specimen was sent to a diagnostic laboratory)
5. Other Laboratory Accession Number (if sent to more than one diagnostic laboratory)
6. Cause of death or illness (name of pathogen, disease or other cause)
7. Method used to determine cause of death or illness

Example of a minimum set of data for general Wildlife Disease Surveillance:

Incident ID	Date Found	Latitude	Longitude	Num Dead	Num Sick	Num Submitted
0000035050	12/03/2015	-2.616582693	37.23678589	10	0	2
0000035050	12/03/2015	-2.616582693	37.23678589	10	0	2
0000035051	22/03/2015	54.73492899	-107.5211334	2000	50	10
0000035051	22/03/2015	54.73492899	-107.5211334	2000	50	10

Specimen ID	Latin Name	English Name	Lab Specimen Number
0000035050.1	Syncerus caffer	African Buffalo	ILRI2015.22
0000035050.2	Syncerus caffer	African Buffalo	
0000035051.1	Phalacrocorax auritus	Double-crested Cormorant	PDS20150341
0000035051.2	Phalacrocorax auritus	Double-crested Cormorant	PDS20150342

Primary Diagnosis	Basis for Diagnosis
Anthrax	Bacterial culture and PCR verification
Anthrax	Association with specimen 0000035050.1
Newcastle Disease	Autopsy, Histology, PCR
Newcastle Disease	PCR

Incident ID:

An "incident" generally means a disease occurrence at one location at one time, involving one or more animals. There should be an incident number for each such disease occurrence event for clarity of identification. Each specimen examined (see "specimen number" below) will be associated with a particular incident. This can be very important when there are multiple incidents and multiple specimens. Analysis and interpretation of the surveillance results requires that all the specimens associated with a particular incident can be identified. The incident ID should be designed so that the same format can continue to be used for decades to give sequential numbers to each new incident; that is the reason for all the zeros in the incident ID numbers listed above.

Date Found:

Usually you want to capture the date the animals died, or that the first animal died – the beginning of the event. Often, this date is not known and the first date that can be recorded with certainty is the date on which the incident was first discovered by someone. If this date is not known but a specimen was sent to a diagnostic laboratory, then the earliest date that is known may be the date the specimen is received in the laboratory. It is important to recognize that the date available may not be the same for each specimen; this can affect analysis and interpretation of surveillance data. A database can be set up with a space for any or all of these different potential dates so that it is clear to the people who use the data exactly what date has been recorded (date of first mortality, date dead animal was found, date specimen was received by a laboratory, etc…).

Latitude/Longitude – Location of the Incident:

Information about the location of the incident can be obtained from: GPS units carried by field personnel, GPS units available on mobile telephones, or from maps. Location coordinates can also be obtained from online sources such as: iTouch Map: http://itouchmap.com/latlong.html and Google Earth: https://www.google.com/earth/.

Number Dead, Sick, Submitted:

The point of this information is to give some sense of the scale of the incident. This approach does not capture the numbers of different species that may be dead or sick or submitted; this is a compromise: enough versus too much data. The species submitted to a diagnostic lab will be found in the specimen data. The number dead or sick can be VERY difficult to determine. If the affected animals are very large, and the landscape is flat and open, a total count may be possible. More often, most of the dead and sick animals are difficult to see, even if a systematic search is made. They will be hidden by forests, grass, rocks and other topography. Dead animal carcasses also disappear very quickly – in a few hours to a few days. Thus, for wildlife, the data recorded for number of dead and sick usually are very approximate, often represent a very minimum estimate, and must be interpreted in this way.

Specimen Identification Number:

A specimen is all or part of a dead/sick animal collected for laboratory examination and testing. A specimen number is needed to ensure that all information associated with one specimen is clearly identified as pertaining to that specimen. In the table above, the specimen number is the Incident number with sequential addition of a specimen number after a decimal point. This approach makes it easy to associate a specimen with an incident but it could also be a completely different number.

Latin Name & Common Name:

A Latin Name is essential because Common Names are totally unreliable. Often, there are many common names for a single species of animal and one common name can often be applied to more than one species of animal. It is essential to know the species precisely because a common objective of wildlife disease surveillance is to determine what species of animal carry what pathogens. Also, if a pathogen is found that is important to human or animal health, to trade, or to other things, knowing precisely what species are or can be infected with that pathogen is essential to managing the risks associated with that pathogen. The species is also required information when reporting disease occurrences in wild animals to the OIE. Correctly identifying wild animal species can be challenging and a wildlife disease surveillance program must include people who can correctly identify wildlife species, in the field and also in the laboratories where specimens are sent for examination.

Laboratory Specimen Number:

Most diagnostic laboratories will assign their own laboratory accession numbers to specimens sent to those labs for diagnosis. Thus it is essential to record these laboratory numbers in the surveillance database so that the identity of the specimen is maintained when it is sent to a diagnostic laboratory. The Laboratory probably will NOT record your incident or specimen number. Diagnostic laboratories keep their own records of the diagnostic procedures and tests they perform on specimens. With the laboratory number, it will be possible to go back to the laboratory for additional information about a particular specimen in the surveillance database.

Primary Diagnosis:

Often, a dead animal examined at necropsy and by further testing will be found to have more than one pathogen or disease. The diagnosis of interest to the general surveillance program is the cause of the disease incident. Other findings may be of interest but the main diagnosis of interest is the cause of the incident. Thus, an animal may be shot because it is behaving strangely, and diagnostic examination may find that the animal had rabies. In this case, rabies, not gunshot, is the diagnosis of interest to the surveillance program.

Basis for Diagnosis:

This field captures information about the reliability of the diagnosis. For example, a diagnosis that is made on the basis of clinical signs may be highly reliable for certain diseases in certain species, and very unreliable for other diseases in other species. All primary diagnoses should be recorded but it also is important to indicate the evidence that was used to make the diagnosis.

Additional Data:

There is a large amount of additional information that can be recorded for each incident and each specimen:

- Background information about the Incident
- Names, addresses and contact information for the people who discovered the disease occurrence, who obtained and submitted specimens, etc.
- Autopsy and histological observations
- Each laboratory test carried out, and the result
- Dates of each step in the diagnostic process

These additional data can be important to some surveillance programs and less so to others, and each program will have to decide on the total of information that is to be recorded.

Exercises:

General Wildlife Disease Surveillance in the "*Dominion of Atlantis*"

(Note: this country does not exist)

- ⇨ You will be designing a program of General wildlife disease surveillance for the fictitious country we are calling The Dominion of Atlantis.
- ⇨ General information about the Dominion of Atlantis is given in Appendix A.

Rationale for a Wildlife Disease Surveillance Program in *Atlantis*

Atlantis' reasons for organizing a program of wildlife pathogen and disease surveillance are:

1. To protect wildlife populations by detecting and managing important health issues
   - High economic value of wildlife to national economy
2. Identification of pathogens in wildlife potentially harmful to livestock
3. Identification of pathogens in wildlife potentially harmful to human health
4. Early recognition of new pathogens or diseases, and of unusual epidemiological events.

ACTIVITY 1

Review the information about the *Dominion of Atlantis* (Appendix A) and its reasons for wanting a surveillance program for wildlife diseases.

Outline, in the spaces provided below, how Atlantis could organize each of the four components of a disease surveillance program to meet its objectives.

1. **Detection of Diseases or Dead Wild Animals: (Who can do this? How could it be organized?)**

[write here]

2. **Identification of Pathogens and Diseases (Who can do this? How could it be organized?)**

[write here]

3. **Information Management (Who can do this? How could it be organized?)**

[write here]

4. **Analysis and Communication (Who can do this? How could it be organized?)**

[write here]

General Surveillance Scenarios for *Atlantis*, Data Review and Analysis

ACTIVITY 2

Review and Analysis of Surveillance Data.

(Note: Two different files of general wildlife disease surveillance data are available. Each provides a different set of data containing one year of data from the general wildlife disease surveillance program of the Dominion of Atlantis. Each dataset consists of just over 300 records of pathogens or diseases that were detected and identified in wild animals. The exercises based on these sets of general wildlife disease surveillance data can be carried out on just one of the datasets, or they can be carried out separately on each of the two sets of data.

The data are in separate Excel files entitled: Dataset General Surveillance 1 (G1) and Dataset General Surveillance 2 (G2). Download and save a copy of the spreadsheet on your computer. These files can be downloaded from the OIE website. If you introduce errors into the data, you can delete that file on your computer, and download another copy and start over.

To complete the exercises, you will also need to review the maps and charts that were created from the data provided in the Excel data files. These are available in Appendix B.1 for General Surveillance 1 and Appendix B.2 for General Surveillance 2.

1. Learn to sort the data on the spreadsheet so you can more easily review it.
(5 minutes)

To sort the data, use the following procedure:

- Highlight ALL of the rows and columns of the total set of data, all 300+ rows, *including* the row of column labels.
    - Note: If you leave out some rows or columns when you sort the data, those rows and columns will not be sorted, while the highlighted data will be reorganized. If this occurs, the data for each incident and specimen will be mixed up with data from other incidents and specimens and it will then be impossible review the surveillance results.
- Click on the "Sort & Filter" button at the top of the screen
- From the drop-down list, select "Custom Sort"
- A new window will appear in which you can choose the category of data to "sort by". Select the category you want from the drop-down list. The list of categories will be taken from the first row of the spreadsheet that you have highlighted. Choose the category of data by which you want to re-arrange the whole spreadsheet.
    - For example – you may choose to sort the data by "date found" or by "Latin Name" of the affected animal or by "primary diagnosis".
    - You can sort the data as many times as you want, but don't leave out any rows or columns when you perform each sort.

2. Review the full set of data and Map G1A or G2A, which shows the location of each disease occurrence for dataset G1 or G2.

What kinds of Errors can you find in the data? (Don't spend too much time on this)

- Missing Information:
    - Read the Column Headings to see the kinds of data recorded
    - Quickly look over the rows and columns and note where you see blank cells.
        - Note the kind of information that is sometimes missing
        - To see how commonly certain kinds of data were not recorded during the surveillance program of 2015, sort the whole data set by that category of data. For example, sort by Date Found, or Latin Name, or Primary Diagnosis, or Latitude and note how many records are missing this value.
        - List the categories of data you find are sometimes missing and note approximately the percent of records that are missing this information

- Can you find errors in location?
    - Look for Latitude with negative values and longitude with positive values – Atlantis is North of the equator (positive number) and west of 0 degrees longitude (negative number)
    - Look at Map G1 A or G2 A – this shows all of the locations at which dead animals were found. Do you see any potential errors on this map?
- Can you determine if there are any duplicate records? Cases that have been entered more than once and will seem to be different cases?
    - Try sorting by "Specimen ID" and look for duplicate entries

Make a list of the kinds of errors or omissions you have found. Why do you think these different kinds of errors have occurred in the survey data?

[write here]

Do you see any patterns in the Data?
(A "pattern" is an easily–seen difference from an even or random distribution of events)

- Patterns in the location of disease occurrence? (look at the Maps provided)
- Patterns according to time of year? (try sorting data by "date found")
    - Look at Chart G1A or G2A – this shows all dead animals found in 2015 according to the date on which they were found
- Patterns in the occurrence of certain diseases? (try sorting data by "primary diagnosis", and then by "date found" within the first sort)
    - Also Review Maps G1 B, C or G2 B, C, D, and the Charts provided in Appendix B

Make a list of the kinds of patterns you have found. Can you explain why some of these patterns may have occurred?

[write here]

Do you see any diseases or pathogens that strike you as particularly important for the *Dominion of Atlantis*?

- Review the economic and other relevant facts about Atlantis in Appendix A
- Sort the entire dataset by Primary Diagnosis and review the Primary Diagnosis column to see all the pathogens and diseases detected.
    - List the diseases you think might be important and note why you think they may be important.
- Do any of the pathogens or diseases you have identified as potentially important to Atlantis show any particular patterns of occurrence – for example, occurring close together or at the same time of year? To investigate this, you could try the following:
    - Sort the entire dataset by Latitude or by Longitude and then look at the Primary Diagnosis column to see if any of the pathogens or diseases you have identified as important seem to cluster at one location.
    - Sort the entire dataset by Date Found and then look at the Primary Diagnosis column to see if any of those pathogen or disease occurrences seem to all happen at a particular time of year.
        - If you think certain pathogens or diseases occur at a similar time of year, sort the data again by Primary Diagnosis and then look at the dates of occurrence for that pathogen or disease of interest.

List the pathogens and diseases you think may be important to Atlantis and explain your reasons for thinking each one might be important.

[write here]

Do you see any pathogens or disease occurrences that should be **reported to the OIE**?

- OIE-List Diseases? (See Appendix C for a list of these diseases)
    - Remember to look for and include any unusual epidemiological events that might become emerging diseases
- Non-List wildlife diseases of interest to the OIE? (see Appendix C for a list of Non-listed wildlife diseases of interest to OIE)
- Potential emerging diseases that may be of epidemiological significance to Atlantis and other countries?

OIE Terrestrial Animal Health Code, Article 1.1.3.
Veterinary Authorities shall, under the responsibility of the Delegate, send to the *Headquarters*:

1. in accordance with relevant provisions in the *disease* specific chapters, *notification* through the World Animal Health Information System (WAHIS) or by telegram, fax or e-mail, within 24 hours, of any of the following events:
   a) first occurrence of a *listed disease* and/or *infection* in a country, a *zone* or a *compartment*;
   b) re-occurrence of a *listed disease* and/or *infection* in a country, a *zone* or a *compartment* following a report declared the *outbreak* ended;
   c) first occurrence of a new strain of a pathogen of a *listed disease* in a country, a *zone* or a *compartment*;
   d) a sudden and unexpected increase in the distribution, incidence, morbidity or mortality of a *listed disease* prevalent within a country, a *zone* or a *compartment*;
   e) an *emerging disease* with significant morbidity or mortality, or zoonotic potential;
   f) evidence of change in the epidemiology of a *listed disease* (including host range, pathogenicity, strain) in particular if there is a zoonotic impact;

List the pathogens and disease occurrences you find that would fall under each of these categories: a) OIE Listed Diseases, b) non-OIE listed wildlife diseases of interest to the OIE, and c) potential emerging diseases.

[write here]

*Based on your review of the data, **what improvements do you think are needed in the surveillance program** of the Dominion of Atlantis? What improvements would you suggest? How could Atlantis achieve the improvements you think are needed?*

[write here]

Targeted Wildlife Disease Surveillance

Introduction to Targeted Wildlife Disease Surveillance

Definition and Purpose

Definition: **Targeted** wildlife disease surveillance (also called 'active' surveillance) focuses surveillance efforts on one or more particular pathogens (viruses, bacteria, fungi, protozoa) in one or more wild animal species. Different from General wildlife disease surveillance, Targeted surveillance programs usually focus on detection of the target pathogen(s) or infection, not disease (sick animals).

It is not practical to have targeted surveillance programs for every disease or pathogen. Priorities and criteria for the inclusion of pathogens for targeted surveillance vary from country to country and between different regions of the world. The surveillance system should generate information that is needed to improve the current understanding of a certain pathogen or infection, where it occurs and does not occur, how frequent it is and whether it is becoming more or less common, so that appropriate management decisions can be made. Most often, the decision to include a pathogen or infection in a Targeted wildlife disease surveillance program is based on the importance of the pathogen to public health and human wellbeing, either directly (e.g. zoonotic pathogens) or indirectly (e.g. pathogens that can have important effects on livestock production or trade).

The Purpose of Targeted Wildlife Disease Surveillance: Like General wildlife disease surveillance programs, Targeted wildlife surveillance programs need a clearly stated purpose, a clear reason why the surveillance program is needed. Targeted surveillance programs typically are developed when new information about a particular pathogen is received from other surveillance programs, from research projects within a country or from a neighbouring country. This information may be specific to a wild animal species or may arise from surveillance carried out in domestic animals or people. Information from other sources does not only identify the pathogen of concern (the target), but can also provide critical insight about which wild animal species should be included in the program and which diagnostic tests would be most appropriate to use.

Targeted wildlife disease surveillance programs are usually developed and implemented for one of the following reasons:

- To demonstrate freedom from a particular pathogen or infection
- To determine if particular pathogens of concern are present
- To identify trends/patterns in the distribution and occurrence of the pathogen

Most targeted disease surveillance programs that aim to demonstrate freedom from infection are also able to detect the presence of a pathogen should it spread to the country or region. In the first case (to demonstrate freedom from infection), analysis of the data collected will provide evidence that the pathogen is **not** present above a certain level of prevalence, assuming that no, or very few, animals test positive. In the second case (to detect the pathogen), analysis of the data will provide evidence that the pathogen **is** present at or above a certain level of prevalence if one or more animals do test positive.

When a Targeted wildlife surveillance program is designed to identify trends and patterns in the distribution and occurrence of a particular pathogen, usually the intent is to measure prevalence. Prevalence is the proportion of affected animals in the population (these can be new/active infections and older/chronic/recovered cases, depending on the tests used).

Some Targeted disease surveillance programs report incidence rather than prevalence. Incidence is the number of new cases observed in a group of animals in a given time period. Incidence is not the same as prevalence. The difference between incidence and prevalence is most important when investigating infections that can lead to chronic diseases; the difference is less important when doing surveillance on infections that cause only acute disease. Because of the challenges involved in getting accurate population data for wild animal populations, prevalence often can be estimated but incidence usually cannot.

Data collected through Targeted surveillance programs designed to identify trends and patterns in infection are often compared across years (to look for temporal trends) or across regions (to identify higher and lower risk areas). This information can then be used to inform and enhance sanitary practices for domestic animals, and wildlife management plans and activities.

Components of Targeted Wildlife Disease Surveillance

General and Targeted wildlife disease surveillance programs share the same 4 essential components: detection of disease by finding sick or dead wild animals is replaced by a planned collection of samples from wild animals; identification of the target pathogen or infection, management and analysis of the data collected, and interpretation and communication of the findings are all the same. Similarly, both types of surveillance programs rely on a network of people and organisations that work together and communicate well.

Differences between General and Targeted Wildlife Disease Surveillance Programs

Although General and Targeted surveillance programs are designed with the same 4 essential components, there are important differences between the two.

The most important differences are in how samples are collected. While General wildlife disease surveillance programs rely on samples that are obtained opportunistically, effective Targeted surveillance programs carefully plan which animal species will be sampled, from which locations, at what time of year, how many animals should be sampled, whether or not the surveillance will be done with live or dead animals, and whether it will detect the pathogen or only antibodies against the pathogen. Because of these differences, there are sometimes different people involved in sample collection.

In Targeted surveillance, there may not be any need to transport whole carcasses to a laboratory; a sample of feces, blood, or other tissues may be adequate for the purpose of the program.

Targeted surveillance programs also carefully select what tests will be used to determine whether or not a pathogen or antibodies are present in the specimen collected. The characteristics of the tests used can have important impacts on the design of a Targeted surveillance program, particularly on the kinds of samples needed and the number of samples required.

Diagnostic Tests

General Principles

Earlier in the Workshop, the importance of diagnostic laboratories was discussed. Here, we will consider a few more details about the laboratories and the tests that they perform. These concepts are important considerations for interpretation of both General and Targeted wildlife surveillance data.

Many things can be considered diagnostic tests, ranging from clinical observations of animals to complex laboratory analyses. In the case of Targeted surveillance, we typically consider a diagnostic test to be a laboratory test performed on tissues, feces, serum or other samples that evaluates current or past exposure to a particular pathogen. No diagnostic test works perfectly all of the time. Some tests perform better than others and test results also are greatly affected by the quality of the samples collected and how they are handled between collection and testing. Even when all the specimens have been handled correctly, a diagnostic test can yield false positive or false negative results. The biology of each individual animal is slightly different as is their response to infection, and these small differences can have important effects on the behaviour of a diagnostic test.

Selection of which test(s) to use is based on the purpose of the Targeted wildlife disease surveillance program, what the test is intended to measure (i.e. current versus past exposure to a pathogen), the characteristics of the test (i.e. how well the test works), and whether or not the test has been validated for the host animal species for which it is to be used. There are also some practical issues to consider, such as how much the test costs, what specimens are needed, how the specimens need to be handled, what equipment and supplies are needed, and where the testing can be done (i.e. what laboratories can do the testing).

The OIE publishes information about diagnostic tests and their use for diagnosing particular OIE-listed pathogens in the *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals*[4] and the *Manual of Diagnostic Tests and Vaccines for Aquatic Animals*[5]. The focus of these Manuals is on domestic and farmed animals, and consequently there is limited information about diagnostic tests for use in wild animal populations. Information specifically about testing wildlife is being added as chapters are revised. The OIE also designates certain laboratories around the world as OIE Reference Laboratories[6] to recognize their expertise in diagnosis of selected pathogens. These laboratories can provide advice and expertise that are invaluable in the design of Targeted surveillance programs and interpretation of the data. OIE Collaborating Centres[7] can also provide advice and expertise.

Diagnostic Tests for Use on Wild Animal Species

A diagnostic test is only useful if it will correctly identify the pathogens and diseases of interest. To know if a diagnostic test is reliable in this way, it must be thoroughly assessed by a process referred to as "validation." If a diagnostic test is validated, most often the validation is for use on samples taken from only one or a few animal species and for specified samples from that species: e.g. serum from horses. Validation of a diagnostic test requires time, money and expertise, and seldom are diagnostic tests validated for use on more than a small number of different species. Since there are many different species of wild animals, a major concern in wildlife disease surveillance is the selection of diagnostic tests that are likely to provide correct information when used on a range of different species, or even for a single species, for which the test has not been properly validated.

This is a very serious concern. Some diagnostic tests, such as standard ELISA tests to detect antibodies to particular pathogens, simply do not work when applied to species other than the one for which the test was developed. The results from such tests applied to other species are completely invalid and without value. They cannot be interpreted or used in any way.

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4 Available at: http://www.oie.int/international-standard-setting/terrestrial-manual/access-online/
5 Available at: http://www.oie.int/international-standard-setting/aquatic-manual/access-online/
6 Reference Laboratories: http://www.oie.int/our-scientific-expertise/reference-laboratories/introduction/
7 Collaborating Centres: http://www.oie.int/our-scientific-expertise/collaborating-centres/introduction/

More detailed information about specific issues related to the validation of diagnostic assays is provided in a series of OIE Validation Guidelines[8] that are tailored for several fundamentally different types of assay (e.g. detection of nucleic acids, antibodies, or antigens). For specific information for wildlife species, refer to OIE Validation Guideline 3.6.7[9] Principles and methods for the validation of diagnostic tests for infectious diseases applicable to wildlife.

Selecting a Diagnostic Test

In wildlife disease surveillance, it is best to use diagnostic tests which are unlikely to be affected significantly by the host animal species from which the samples to be tested have been taken. To a large extent, this can be predicted based on the technical details of a diagnostic test. For example, a test that detects a pathogen directly, such as culture of bacteria from a tissue, is less likely to be affected by the host species than is a test that is based on the response of the host animal to infection, such as a test for antibodies or a test for another immune response (e.g. TB skin test).

The following table provides some very general guidelines regarding choice of diagnostic tests for wildlife disease surveillance.

Choosing Diagnostic Tests for Wild Animal Pathogens

	LESS likely to be affected by host animal species	**Intermediate**	**MORE likely to be affected by host animal species**
Tests for pathogens	• Direct identification: e.g. parasites • Culture of bacteria, fungi, protozoa • PCR[10] • Immunohistochemistry • Chemical analysis (toxicology)	• Culture for viruses[11]	
Tests for antibodies or immune response	• Virus neutralization • Blocking (competitive) ELISA		• Most standard serology tests: o ELISA • Antigen skin tests (TB)
Other	Newcastle Disease	Brain Cholinesterase[12]	

The OIE *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals* contains much information on choice of diagnostic tests for particular pathogens. Some chapters also consider the application of these tests to a range of host animal species.

8 Available at: http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/GUIDELINE_3.6.0_INTRODUCTION.pdf - Chapter 1.1.5. — Principles and methods of validation of diagnostic assays for infectious diseases

9 Available at: http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/GUIDELINE_3.6.7_WILDLIFE.pdf

10 There can be problems using PCR on some samples from some species, for example ruminant feces.

11 Some viruses can be cultured in standard cell cultures or chicken embryos, but others grow only in cells derived from their natural host species.

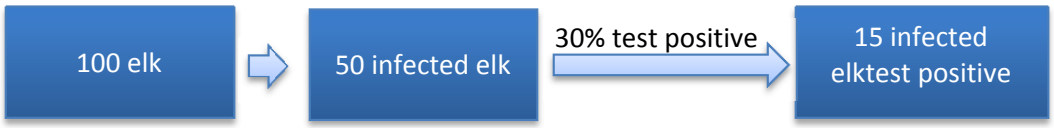
12 This is used as a screening test for poisoning by organophosphate and carbamate insecticides. However, animal species vary greatly in normal background levels.

Attributes and Characteristics

Here you will explore the issue of false test results and how they can affect how you interpret and act on the data generated from Targeted surveillance programs. Start with some examples of tests that have been validated, so you know in advance how likely the results are to be correct or incorrect.

Example 1: Baermann technique to detect larvae of the meningeal worm *Parelaphostrongylus tenuis* in fecal samples from elk (*Cervus elaphus* – a North American ungulate)

Consider a population of 100 elk – 50 that are infected with meningeal worm and 50 that are not. The Baermann technique has been validated for elk and approximately 30% of animals that are infected test positive. That means that 30% of the infected elk will test positive; in other words, only 15 out of the 50 infected elk will test positive for *P. tenuis* using this diagnostic test. This isn't a great diagnostic test!



Example 2: Tuberculin skin test to detect exposure to bovine tuberculosis (*M. bovis*) in cattle

Consider a herd of 1000 cattle in which 500 have tuberculosis and 500 are not infected. The tuberculin skin test has been validated for cattle several times and in several countries. On average, 80% of infected animals test positive. So, of the 500 infected cattle, we can expect 400 of them to test positive. That means that 100 infected animals will test negative (false negatives).

For this particular test, you also know something about how it works in uninfected animals. From the test validation process, it has been determined that, on average, 99.5% of uninfected cattle will test negative. In this example, 498 out of the 500 uninfected animals will test negative; 2 uninfected animals will test positive for tuberculosis (false positives).

		True pathogen status		Total
		+	–	
Diagnostic test result	+	400	2	402
	–	100	498	598
Total		500	500	1000

These two examples introduce the critical characteristics of any diagnostic test – the proportion of truly infected animals that test positive and the proportion of truly pathogen-free animals that test negative. These two measures are called **sensitivity** and **specificity** of the test:

- Sensitivity = the proportion of truly infected animals that test positive
- Specificity = the proportion of truly infection-free animals that test negative

Another way to think about these test characteristics is to ask, "How likely is the test to produce false negative or false positive results?" If the sensitivity of a test is 80%, then 20% of test results will be false negative (100% - 80% = 20%); if the specificity of a test is 90%, then 10% of test results will be false positives (100% - 90% = 10%).

The key concept to grasp here is that a positive diagnostic test result does not always mean that the targeted pathogen is present or that the animal was exposed. Additionally, a negative test result does not always mean that the pathogen is absent. No matter how common the pathogen or infection is in the population of interest, the sensitivity and specificity of a diagnostic test do not change. But in the case of interpreting diagnostic tests applied to wildlife, keep in mind that a test validated for a domestic animal species may behave very differently in a different species. You cannot assume that the sensitivity and specificity of a test will be the same when applied to samples from a different species. Almost certainly they will be different.

Note: Epidemiologists and laboratory-based researchers both use the terms sensitivity and specificity but each means something different. The definitions above refer to epidemiological sensitivity and specificity. To the laboratory-based researcher, (analytic) sensitivity refers to the lowest concentration the test can detect in a specimen while (analytic) specificity refers the ability of the test to react to only one compound.

Interpretation of Test Results

The Influence of True Prevalence

Although sensitivity and specificity of diagnostic tests are independent of the pathogen prevalence, **interpretation of the test result depends on the proportion of animals that are infected in the population of interest**. To explore this further, you are going to work through the example below.

Example 3: Consider a validated diagnostic test with <u>sensitivity = 99%</u> and <u>specificity = 90%</u>, and apply this test to a population of 1000 animals in which 10% of the animals are truly infected.

		True pathogen status		Total	Predictive values
		+	–		
Diagnostic test result	+	99	90	402	PPV=99/189=52%
	–	1	810	598	NPV=810/811=99.9%
Total		100	1000	1000	

To complete the table above, start with a population of 1000 animals. Assume you know that 10% of the animals in this population are infected. This measure (10%) is often referred to as the **true prevalence**. (You rarely know this for wildlife, but assume you do know it for this example) If the true prevalence is 10%, then 100 animals in this population are infected and 900 are not.

You also know that the test sensitivity is 99%. This means that 99 out of the 100 infected animals will test positive, whereas 1 infected animal will test negative. With a test specificity of 90%, 810 of the uninfected animals will test negative and 90 will test positive.

The test characteristics (sensitivity and specificity) tell you about how the test works in the population. But remember, when you are doing real surveillance, you don't know ahead of time which animals are truly infected and which ones are not. The test results will only indicate which animals *tested* positive and which ones *tested* negative. In this example, 189 animals tested positive and 811 tested negative. These *test results* suggest that the prevalence of infection is 19% (189/1000). To distinguish the prevalence estimated from the test results from the true prevalence (10%), the prevalence estimated from the test results is called the **apparent prevalence**. In this example, it is almost twice as high as the true prevalence.

Using Test Performance Characteristics to Interpret Surveillance Results

In the example above, 99 infected animals tested positive and 90 uninfected animals tested positive; in total, 189 animals tested positive. Because you know the true prevalence of infection in the population and the sensitivity and specificity of the diagnostic test, you can calculate how likely it is that a test-positive animal is truly infected. In this case, 99 out of 189 (52%) test-positive animals are truly infected. This is called the **positive predictive value** of the test. In this case, there is a 52% chance that an animal that tests positive truly is infected. Another way to look at this is that 90 out of 189 (48%) test-positive animals are actually not infected and that 48% of the test results are false positives.

By doing a similar calculation for the test-negative animals, you can determine that, out of 811 test-negative animals, 810 (99.9%) are truly not infected; just one animal falsely tested positive. In this example the **negative predictive value** of the test is 99.9%. In other words, if an animal tested negative, there is a 99.9% chance that the animal is not infected.

- The positive predictive value indicates the probability that a test-positive animal is truly positive
- The negative predictive value indicates the probability that a test negative animal is truly negative.
- These two calculated values indicate how confident you can be in the positive and in the negative test results
- The predictive values of a diagnostic test, and the confidence you can have in test results, depend on the sensitivity and specificity of the diagnostic test and they also depend on the true pathogen prevalence in the population.

To show how the predictive values of a test can be changed by the actual, true prevalence of infection in the population, fill out the two tables below. In both tables, apply the imaginary diagnostic test to a population of 1000 animals and use a test sensitivity of 99% and a specificity of 90%.

Exercises:

Targeted Wildlife Disease Surveillance in the "*Dominion of Atlantis*"

(Note: this country does not exist)

Diagnostic Tests Exercises (part 1): Prevalence

ACTIVITY 3

1. Complete the tables below with the information provided.
2. Calculate the predictive values for the different prevalence levels.

A. Low pathogen prevalence – 2%

		True disease/pathogen status		Total	Predictive values
		+	–		
Diagnostic test result	+				
	–				
Total				1000	

True prevalence = 2%
Sensitivity = 99%
Specificity = 90%

B. High pathogen prevalence – 40%

		True disease/pathogen status		Total	Predictive values
		+	–		
Diagnostic test result	+				
	–				
Total				1000	

True prevalence = 40%
Sensitivity = 99%
Specificity = 90%

C. Describe the effect of true prevalence on the interpretation of the test results.

What happened to the predictive values of the test when true prevalence was changed?
What happened to the apparent prevalence?

[write here]

Diagnostic Tests Exercises (part 2): Sensitivity and Specificity

ACTIVITY 4

1. Complete the tables below with the information provided.
2. Calculate the predictive values for the different tests characteristics.
3. Describe how the interpretation of a test changes as sensitivity and specificity increase and decrease

Now that you have seen how the prevalence can affect interpretation of test results, examine what happens when test sensitivity and specificity increase and decrease. Use the first example as a starting point – a population with a true prevalence of 10% and a diagnostic test with sensitivity = 99% and specificity = 90%. Now, what would happen if you used a test with a different sensitivity and specificity to detect infection in the same population (where 10% of the animals are infected)? Work through the next 2 examples.

A. Low Sensitivity

		True disease/pathogen status		Total	Predictive values
		+	–		
Diagnostic test result	+				
	–				
Total				1000	

True prevalence = 10%
Sensitivity = 80%
Specificity = 90%

B. High Specificity

		True disease/pathogen status		Total	Predictive values
		+	–		
Diagnostic test result	+				
	–				
Total				1000	

True prevalence = 10%
Sensitivity = 80%
Specificity = 99%

C. What happened to the predictive values of the test when sensitivity or specificity was changed?

[write here]

D. There are times when tests with higher sensitivity are preferred and other times when higher specificity is needed

Propose some examples of surveillance objectives for which tests with higher sensitivity, or with higher specificity, would be advantageous.

[write here]

These examples are all theoretical. Remember that you rarely know the test characteristics (sensitivity and specificity) for tests applied to wildlife and usually don't know even the approximate true prevalence in the population of interest, particularly in the case of an emerging or new disease.

How can you make practical use of this information?

- When you know nothing about test performance or prevalence, you can do a preliminary survey with one or more diagnostic tests and use those results as approximate information about test performance and prevalence. This can provide a baseline for future surveillance, a starting point for further work.
- If a test is applied to a wild population and unexpected results are obtained, further investigation is warranted before management actions are taken. For example, additional testing procedures may be available to confirm that the test-positive animals truly are positive.

How can the predictive values of a test be increased?

There are several ways to increase the predictive value of a test:

- Apply the test to a subgroup of animals with a higher pathogen prevalence (e.g. only test clinically sick animals, or animals in which the pathogen is more frequently observed – e.g. older or younger animals; males versus females)
    - Effectively you are increasing the pathogen prevalence in the surveillance sample.
- Use more than one diagnostic test. If this option is chosen, there are 2 ways of interpreting the test results:
    - Series – animals are tested with one test first; those that test positive are then tested again using a second test (the tests are applied one after the other)
        - Positive animals test positive to both (all) tests applied; this effectively increases the test specificity and decreases the test sensitivity
        - If this option is chosen, usually all animals are tested with the cheaper/easier test first and then, if they test positive, the more expensive or complex test is run
    - Parallel – all animals are tested with both tests and the tests are applied at the same time

- Positive animals test positive to one or more tests; this effectively increases the test sensitivity and decreases the test specificity)

It is important to emphasize that the sensitivity and specificity of diagnostic tests reflect how the test behaves in an individual animal. How a particular diagnostic test works in the population at large (known as herd sensitivity and herd specificity) depends on what proportion of animals in the herd is infected (i.e. prevalence), how many animals are tested (the sample size) and the cut-off value for the number of animals that may test positive before the herd is considered to be positive. This topic of herd-level specificity and sensitivity is beyond the scope of this workbook.

Calculating sample size

How many animals need to be included in a surveillance program?

You will now turn your attention to determining how many samples are needed for Targeted wildlife disease surveillance, and consider how diagnostic test performance can affect requirements for sample size.

Except in very rare situations, you will not be able to test every animal in the population of interest. Consequently, you usually select a subset of the whole population. Typically, the number of individual animals that are sampled in a targeted surveillance program will be decided on the basis of what you want to measure, how confident you want to be in the results, and what can practically be achieved with the available money, time and resources.

The choice of what population of animals to sample will depend on the purpose of the surveillance program. If the intent is to estimate true prevalence, then the sample should be as representative of the population of interest as possible. If the purpose is just to detect infection or demonstrate freedom, it may be more appropriate to focus surveillance efforts on animals at higher risk of infection, recognizing that these data will not represent the population at large.

The number of animals that need to be tested as part of a targeted surveillance program (sample size) depends on four main factors:

1. The purpose of the surveillance program and whether you are seeking information about prevalence or an indication that the targeted pathogen or infection is present or not in the population of interest.

2. How confident you want to be in the estimates generated by the surveillance data

    - Most surveillance programs, regardless of their purpose, aim to achieve 95% or 99% confidence

        - If the purpose of the surveillance program is to demonstrate freedom from infection and none of the sampled animals test positive, then the confidence level is a measure of how certain you can be that the pathogen is not present in the population

        - If the purpose of the surveillance program is to estimate pathogen prevalence in the population, then the level of confidence is a measure of how certain you can be that the true prevalence is within the range of the apparent prevalence that you have calculated.

3. The size of the population of interest

    - Most wild populations are fairly large and so the size of the population of interest does not have a large impact on how many animals need to be included in the surveillance program. However, in the case of species at risk or other small populations, occasionally the normally required sample size represents a large proportion of all the animals in the population or even a number greater than the total population. In these situations, the sample size can and should be recalculated in consideration of the small total population (see below).

4. The characteristics of the diagnostic tests used

    - As discussed earlier, diagnostic tests are rarely perfect and may over- or under-estimate the number of animals infected or not infected. This is particularly the case for wild animal populations for which there are few validated diagnostic tests. The sensitivity and specificity of diagnostic tests can increase OR decrease the sample size needed.

There are some basic equations that can be used to calculate a sample size for targeted surveillance programs. The equations are a bit different, depending on what the purpose of the program is.

Sampling to detect infection or to demonstrate that the pathogen is not present at or below a specified value:

The simplest equation has been described as the "rule of three" (Hanley and Lippmann-Hand, 1983). According to this "rule", if no animals test positive for the target pathogen, you can be 95% confident that, at most, 3 of the sampled animals were truly positive. If 47 bison were tested for tuberculosis and none tested positive, then you can be 95% confident that at most 3/47 bison are truly positive (i.e. the apparent prevalence of infection is 6% or less). This rule was developed using more exact methods, such as the equation below.

$n=[1-(1-\alpha)^{1/D}][N-(D-1)/2]$

α= desired level of confidence
N=Number of animals in the population of interest
D=Number of infected animals in the population of interest

Minimum sample sizes needed to be 95% confident that the pathogen is present at/or below specified prevalence, if no infected animals are observed

Population size	Estimated pathogen prevalence			
	1%	5%	10%	50%
100	95	45	25	5
1000	258	58	29*	5
10000	294	59	29*	5

* If you sample 29 animals and all of them test negative then you can be 95% confident that, if the pathogen is present, the prevalence is less than 10%

Two take home messages:

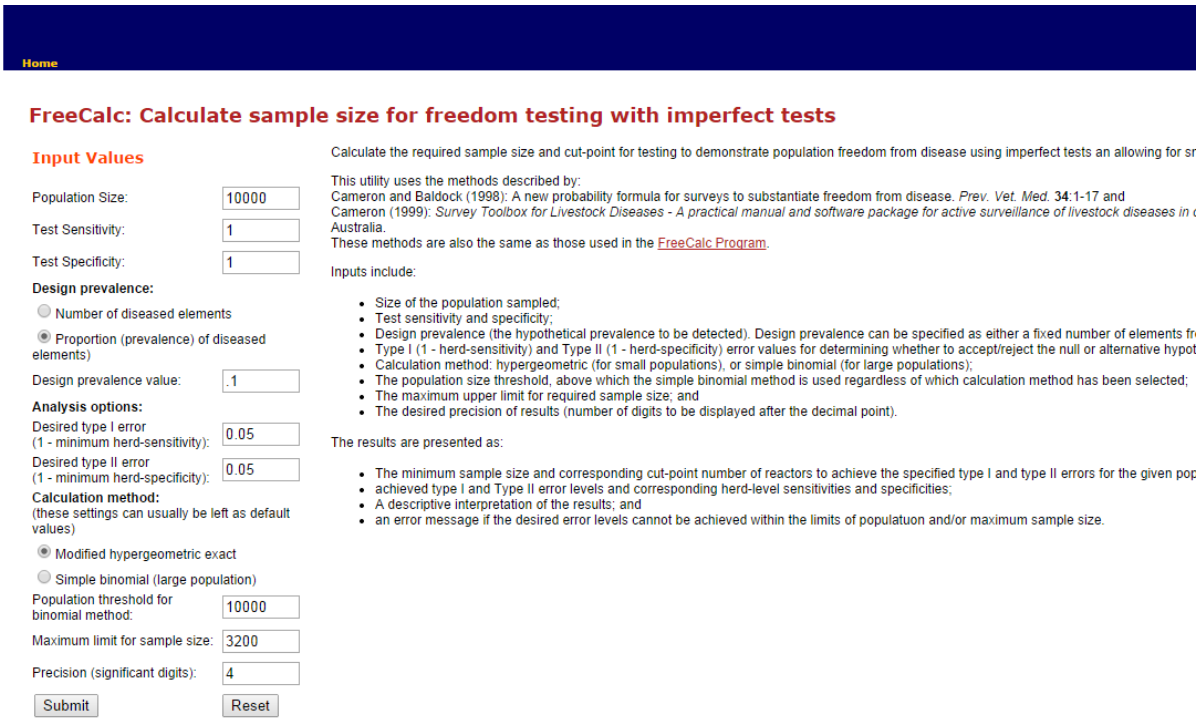
1) **The rarer you expect the infection to be, the greater the number of animals that will need to be tested** and
2) **The bigger the population of interest, the greater the number (but the smaller the proportion) of animals that will need to be tested**

What has this equation ignored? Consider the 4 main factors that affect sample size calculations (provided above). The characteristics of the diagnostic tests used have not been considered.

Computer Tools to Calculate Required Sample Size

There are ways to include the sensitivity and specificity of the diagnostic test in the sample size calculations, but it makes the calculation quite a bit more complicated. Luckily, there are several website applications and down-loadable software that will do the calculations for you; all you need to do is plug in the numbers. Examples from Epi Tools (AusVet Animal Health Services - http://www.ausvet.com.au/content.php?page=epitools) are shown below. The same numbers from the table above were entered into FreeCalc (http://epitools.ausvet.com.au/content.php?page=FreeCalc2). Below are some screen shots to demonstrate how this tool works.

If you first assume that the tests are perfect, you get the same answer as you did in Table above. To do this yourself, enter the information in the first window, press "submit" and the FreeCalc sample size estimation results are generated: the required sample size is 29 animals, the same as in Table above. The desired type I and type II error level was set at 5% (shown in the screen shots below).



FreeCalc sample size estimation

Analysed: Fri Sep 12 2014 @ 03:27

Inputs

Test sensitivity	1
Test specificity	1
Population size	10000
Design prevalence	0.1
Diseased elements	1000
Analysis method	Modified hypergeometric exact
Target Type I error	0.05
Target Type II error	0.05
Population threshold for infinite probability formula	10000
Maximum sample size	3200

Results

Required sample size:	29
Cut-point number of reactors:	0
Type I error:	0.0469
Type II error:	0
Herd-level sensitivity:	0.9531
Herd-level specificity:	1
Interpretation:	If a random sample of **29** units is taken from a population of **10000** and **0** or fewer reactors are found, the probability that the population is diseased at a prevalence of **0.1** is **0.0469.**
Method:	Modified hypergeometric exact

Download excel file of results

Detailed results

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AusVet Animal Health Services

This site was created by AusVet Animal Health Services with funding from the Australian Biosecurity Cooperative Research Centre. It provides a range of epidemiological tools for the use of epidemiologists, particularly in animal health. Please send any comments, questions or suggestions to Evan Sergeant

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Now, adjust the test characteristics to a sensitivity value of 99% and specificity value of 90% and see what happens.

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FreeCalc: Calculate sample size for freedom testing with imperfect tests

Input Values

Population Size: 10000

Test Sensitivity: .99

Test Specificity: .9

Design prevalence:

- Number of diseased elements
- Proportion (prevalence) of diseased elements)

Design prevalence value: .1

Analysis options:

Desired type I error (1 - minimum herd-sensitivity): 0.05

Desired type II error (1 - minimum herd-specificity): 0.05

Calculation method:
(these settings can usually be left as default values)

- Modified hypergeometric exact
- Simple binomial (large population)

Population threshold for binomial method: 10000

Maximum limit for sample size: 3200

Precision (significant digits): 4

Submit Reset

Calculate the required sample size and cut-point for testing to demonstrate population freedom from disease using imperfect tests an allowi

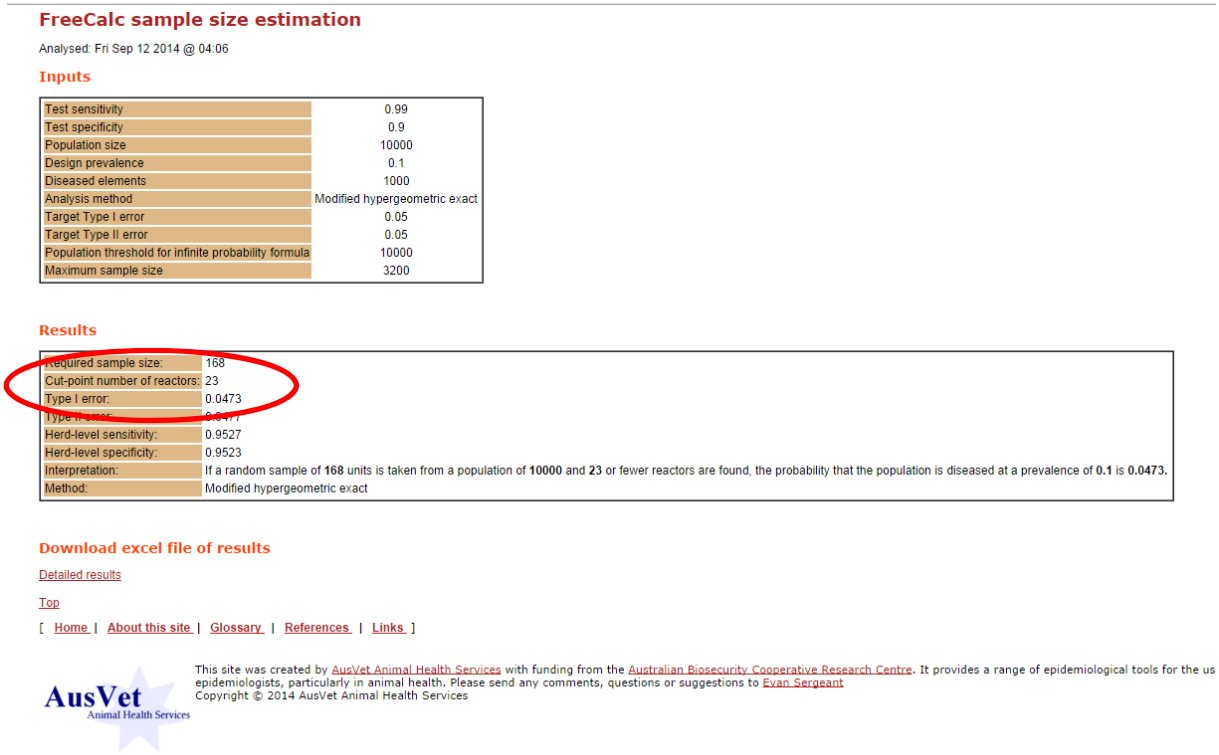
This utility uses the methods described by:
Cameron and Baldock (1998): A new probability formula for surveys to substantiate freedom from disease. *Prev. Vet. Med.* **34**:1-17 and
Cameron (1999): *Survey Toolbox for Livestock Diseases - A practical manual and software package for active surveillance of livestock dise*
Australia.
These methods are also the same as those used in the FreeCalc Program.

Inputs include:

- Size of the population sampled;
- Test sensitivity and specificity;
- Design prevalence (the hypothetical prevalence to be detected). Design prevalence can be specified as either a fixed number of ele
- Type I (1 - herd-sensitivity) and Type II (1 - herd-specificity) error values for determining whether to accept/reject the null or alternati
- Calculation method: hypergeometric (for small populations), or simple binomial (for large populations);
- The population size threshold, above which the simple binomial method is used regardless of which calculation method has been se
- The maximum upper limit for required sample size; and
- The desired precision of results (number of digits to be displayed after the decimal point).

The results are presented as:

- The minimum sample size and corresponding cut-point number of reactors to achieve the specified type I and type II errors for the g
- achieved type I and Type II error levels and corresponding herd-level sensitivities and specificities;
- A descriptive interpretation of the results; and
- an error message if the desired error levels cannot be achieved within the limits of populatuon and/or maximum sample size.



FreeCalc sample size estimation

Analysed: Fri Sep 12 2014 @ 04:06

Inputs

Test sensitivity	0.99
Test specificity	0.9
Population size	10000
Design prevalence	0.1
Diseased elements	1000
Analysis method	Modified hypergeometric exact
Target Type I error	0.05
Target Type II error	0.05
Population threshold for infinite probability formula	10000
Maximum sample size	3200

Results

Required sample size:	168
Cut-point number of reactors:	23
Type I error:	0.0473
Type II error:	0.0477
Herd-level sensitivity:	0.9527
Herd-level specificity:	0.9523
Interpretation:	If a random sample of **168** units is taken from a population of **10000** and **23** or fewer reactors are found, the probability that the population is diseased at a prevalence of **0.1** is **0.0473.**
Method:	Modified hypergeometric exact

Download excel file of results

Detailed results

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AusVet Animal Health Services

This site was created by AusVet Animal Health Services with funding from the Australian Biosecurity Cooperative Research Centre. It provides a range of epidemiological tools for the us epidemiologists, particularly in animal health. Please send any comments, questions or suggestions to Evan Sergeant

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From the screen shots above, the minimum required sample size is 168 and out of those 168 animals, up to 23 animals could test positive and you would still be 95% confident that the prevalence of infection in the population of interest was less than 10%.

Sample size calculation to estimate prevalence

Now that you have detected the pathogen, how many animals do you need to test to determine how prevalent the pathogen is in the animal population of interest? To calculate this, you use different equations, but basically the same information is needed: an estimate of the true prevalence and the level of confidence you want or require. You will also need to decide how closely you want the sample prevalence estimate (apparent prevalence) to be to the true prevalence. When good information about pathogen prevalence in the population is not available, you may wish to calculate a sample size based on several different but possible prevalence estimates and balance the resulting range of sample sizes with the resources available.

Equations:

a) For 95% confidence: $n=4P(1-P)/L^2$

b) For 99% confidence: $n=6.6P(1-P)/L^2$

P = estimate of the true pathogen prevalence in the population of interest
L = allowable error – this is a measure of how close you want the apparent prevalence to be to the true prevalence

Calculated sample sizes you will need for the given allowable error and estimated pathogen prevalence (with 95% confidence)

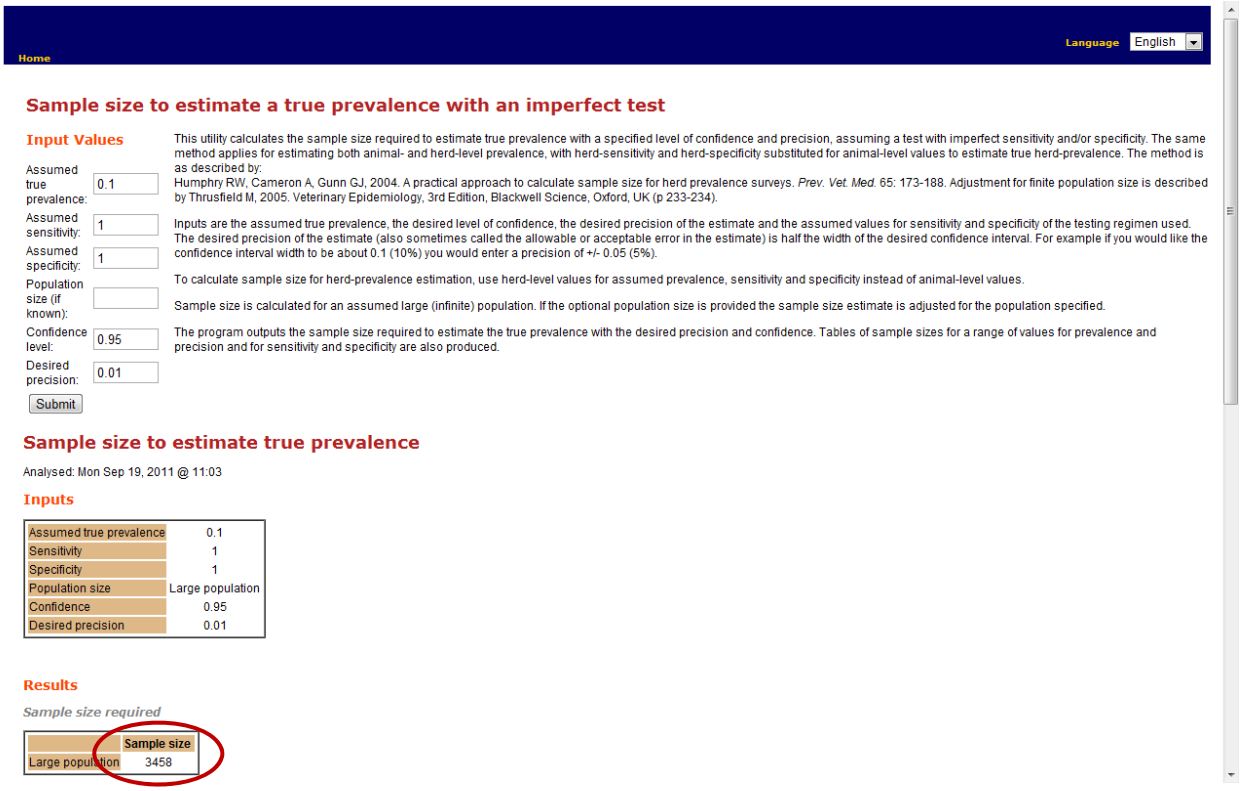
Allowable error (closeness to true prevalence)	**Estimated pathogen prevalence**		
	2%	**10%**	**45%**
0.1%	78400	360000	990000
1%	784	3600	9900
10%	8	36	99

Table (above) lists a few sample sizes needed to estimate prevalence. Try using equation a) above, for 95% confidence, to calculate the sample size needed to determine prevalence if the estimated true prevalence (P) is 10%, the allowable error (L) is 1%.

In general, **the more extreme the prevalence estimate is** (i.e. if nearly all of the animals in the population are believed to be infected or virtually no animals are thought to be infected), **the smaller the number of samples needed to attain the desired level of confidence**.

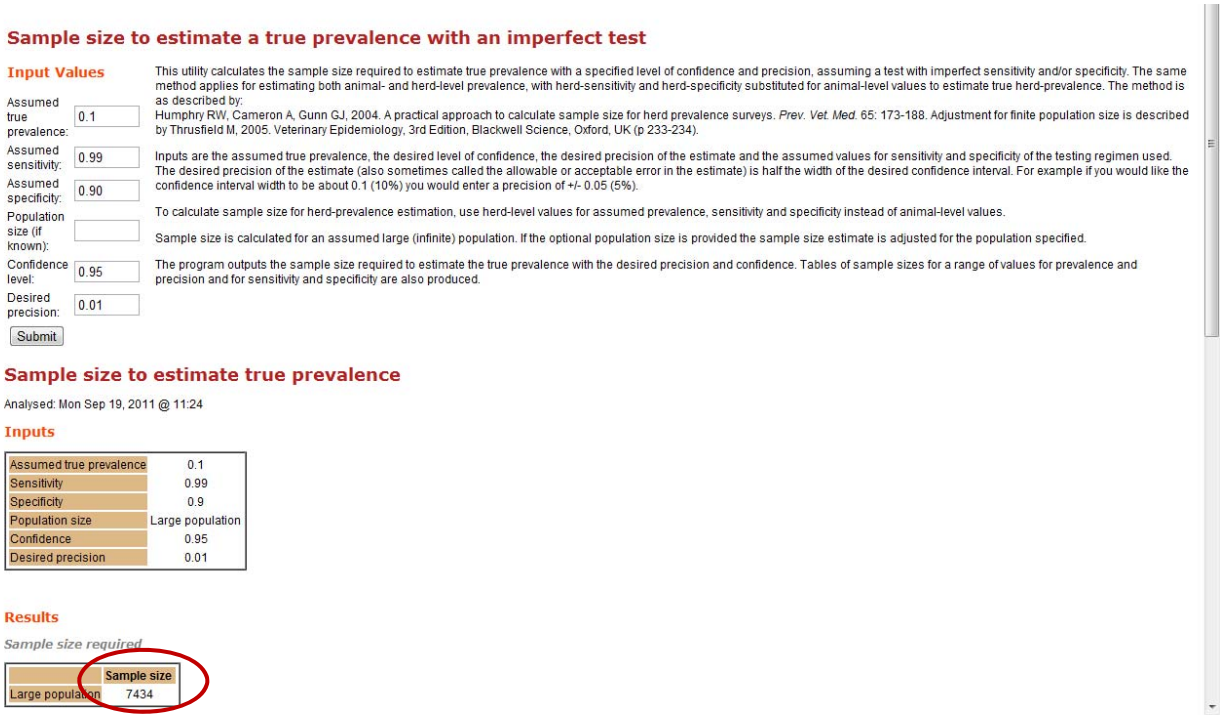
Again, there are programs available online that will calculate sample size needed to estimate prevalence and account for imperfect tests. As an example, the same numbers above have been entered into the prevalence sample size calculation page developed by Ausvet (http://epitools.ausvet.com.au/content.php?page=PrevalenceSS). Below are some screen shots to demonstrate how this tool works.

Sample size calculation using a <u>perfect diagnostic test</u> (sensitivity and specificity are 100%)



From the screen shot above, the minimum required sample size is 3458. This is similar to what you calculated using the equation provided; estimating the true prevalence to be 10% and an allowable error of 1%, the equation (with 95% confidence) determined that a sample size of 3600 animals was needed (see Table above).

Sample size calculation using an <u>imperfect diagnostic test</u> (sensitivity=99% and specificity=90%)



Sample size to estimate a true prevalence with an imperfect test

Input Values

Assumed true prevalence: 0.1
Assumed sensitivity: 0.99
Assumed specificity: 0.90
Population size (if known):
Confidence level: 0.95
Desired precision: 0.01
Submit

This utility calculates the sample size required to estimate true prevalence with a specified level of confidence and precision, assuming a test with imperfect sensitivity and/or specificity. The same method applies for estimating both animal- and herd-level prevalence, with herd-sensitivity and herd-specificity substituted for animal-level values to estimate true herd-prevalence. The method is as described by:
Humphry RW, Cameron A, Gunn GJ, 2004. A practical approach to calculate sample size for herd prevalence surveys. *Prev. Vet. Med.* 65: 173-188. Adjustment for finite population size is described by Thrusfield M, 2005. Veterinary Epidemiology, 3rd Edition, Blackwell Science, Oxford, UK (p 233-234).

Inputs are the assumed true prevalence, the desired level of confidence, the desired precision of the estimate and the assumed values for sensitivity and specificity of the testing regimen used. The desired precision of the estimate (also sometimes called the allowable or acceptable error in the estimate) is half the width of the desired confidence interval. For example if you would like the confidence interval width to be about 0.1 (10%) you would enter a precision of +/- 0.05 (5%).

To calculate sample size for herd-prevalence estimation, use herd-level values for assumed prevalence, sensitivity and specificity instead of animal-level values.

Sample size is calculated for an assumed large (infinite) population. If the optional population size is provided the sample size estimate is adjusted for the population specified.

The program outputs the sample size required to estimate the true prevalence with the desired precision and confidence. Tables of sample sizes for a range of values for prevalence and precision and for sensitivity and specificity are also produced.

Sample size to estimate true prevalence

Analysed: Mon Sep 19, 2011 @ 11:24

Inputs

Assumed true prevalence	0.1
Sensitivity	0.99
Specificity	0.9
Population size	Large population
Confidence	0.95
Desired precision	0.01

Results

Sample size required

	Sample size
Large population	7434

From the screen shot above, the minimum required sample size is 7434. As the diagnostic test used was not perfect, more than twice as many animals have to be tested to be able to estimate the prevalence with the desired level of confidence (95%) and precision (1%).

Sample Size for small populations of animals

If you are doing surveillance in a small population (e.g. rare species), then you may need to correct the sample size estimate for small populations. From the examples above, you first determined (assuming a perfect test) that you needed to test 3458 animals. But what if there were only about 5000 animals in total in the population of interest? There are enough animals but it might be very hard to obtain samples from that many. **If the calculated required sample size represents 10% or more of the total population, you can adjust the sample size using the following equation**:

$$1/n^* = 1/n + 1/N$$

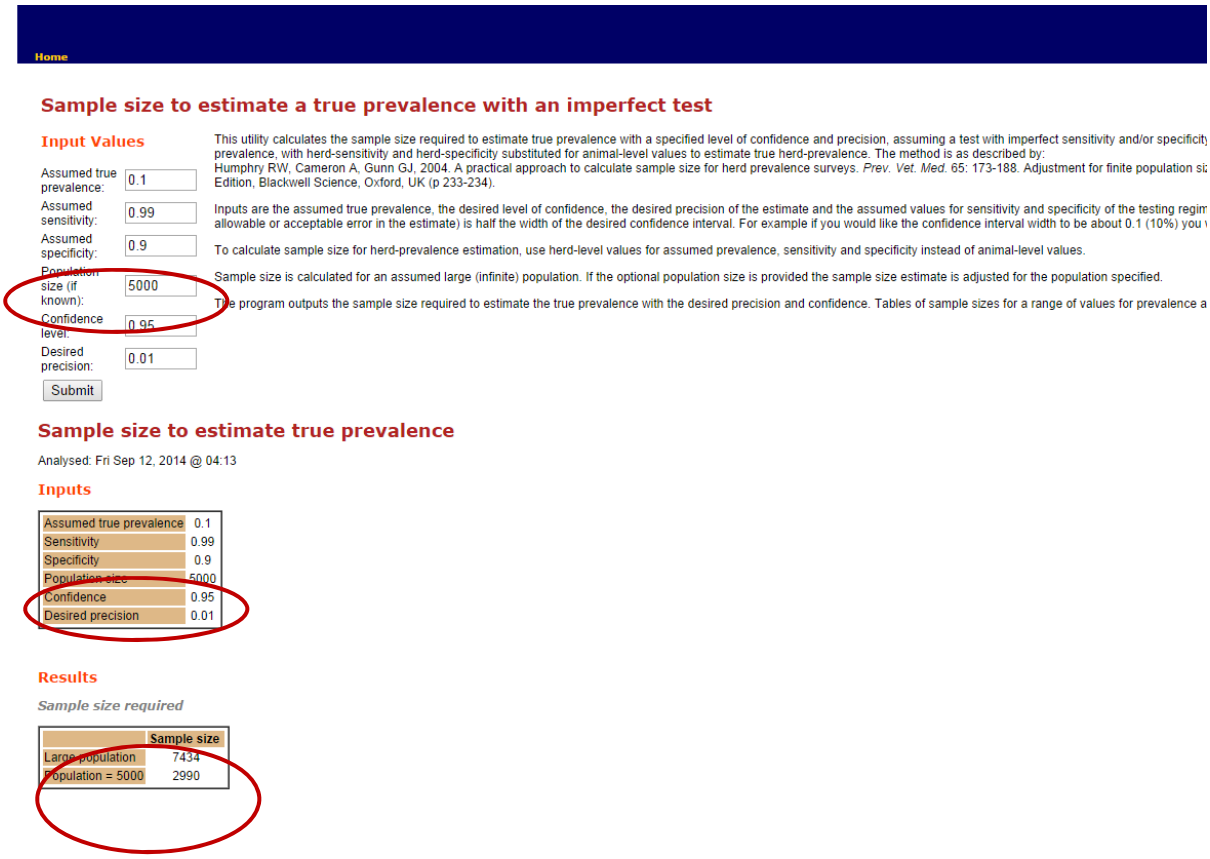
n*= the corrected sample size
n=the estimated sample size before correction
N=the population size

So, for the examples above:

1/n*=1/3458 + 1/5000 and so n*=2044 animals instead of 3458.

Alternatively, you can add information to the online program and it will account for the small population for you, as well as test performance parameters.

Sample size calculation using an imperfect diagnostic test (sensitivity=99% and specificity=90%) <u>for a small population</u>



From the screen shot above, when accounting for the small population size, the sample size changed from 7434 to 2990.

All sample size calculations provide estimates of minimum sample size. It is a good idea to increase the number of samples above the minimum value, even when the characteristics of the diagnostic tests have been accounted for, in case some samples are mishandled, there is a problem at the laboratory or for other unforeseen issues that might arise.

Designing a Targeted Wildlife Disease Surveillance Program

In which wild species will you look for the pathogen or disease?

Pre-existing knowledge about the target pathogen or infection is critical for design of effective Targeted wildlife surveillance programs. This preliminary knowledge comes, most often, from General wildlife disease surveillance. The wild species that are competent hosts for the pathogen of interest in the country must be known, along with the approximate size of their population(s) and geographic distribution(s). Identification of the wild animal species to be sampled will inform how animals will be caught or trapped, from where and by whom.

The choice of which competent host species are most appropriate to include in a Targeted surveillance program depends on how the targeted pathogen behaves in the various host species and on the purpose of the surveillance program. For instance, if the purpose is to determine *if* a particular disease or pathogen is present in wild animals in a country, you might select a species that is known to develop actual disease (i.e. show clinical symptoms characteristic of the disease caused by the target pathogen) rather than a species that does not develop disease following infection. However, if the purpose of the targeted surveillance program is to estimate prevalence of an infection for which the wild animal may be a carrier of the pathogen, but may not develop clinical disease, then you may choose to sample both apparently healthy and sick animals.

In some situations, certain wild animal species are selected for inclusion in Targeted surveillance programs because they are easier to find and to sample than others.

If the purpose of the Targeted surveillance program is to detect the presence of a targeted pathogen, or demonstrate freedom, it might be appropriate to target certain subsets of the host populations. For example, for some pathogens, animals of a certain age or sex may be more susceptible to infection than others and therefore may be targeted to maximise the chances of detecting the pathogen. In other situations, it might be appropriate to sample domestic animals to determine whether or not a pathogen of wildlife is present or absent from an area. For example, farm dogs have been used to determine whether or not plague (*Yersinia pestis*) was present in local rodents[13]. The dogs, which hunted the rodents, were easier to catch and handle than the wild rodents themselves.

Where should you look and when?

When sampling wild animals, you need to consider where the host animals of interest are located and whether or not their location changes over time. This is particularly important when migratory species are the target of the surveillance program. For example, avian influenza surveillance in wild waterfowl in the northern hemisphere is often conducted in the late summer and early fall when the birds congregate together at staging grounds before their southward migration. At this time and place, there are many birds together in a smaller area so trapping is easier and many of the birds are young of the year and they tend to be more susceptible to infection with avian influenza than older birds.

If a Targeted surveillance program is set up to look for a pathogen that is known to affect animals in a neighbouring jurisdiction, surveillance activities may be focused along the border region.

[13] Leighton FA, Artsob HA, Chu MC, & Olson JG. 2001. A serological survey of rural dogs and cats on the southwestern Canadian prairie for zoonotic pathogens. *Canadian Journal of Public Health*, **92**(1):67-71.

The decision about where to look for a pathogen also depends on the purpose of the surveillance program. If the intent is to detect a zoonotic disease agent of public health importance, surveillance of sentinel wildlife species might be done primarily in urban areas where the greatest numbers of people live. Similarly, if the purpose is to detect a pathogen of importance to domestic animals, then wildlife may be targeted in and around important agricultural areas.

What specific animals should be included?

The choice regarding which animals to include in a targeted surveillance program depends on the objectives of that program. For example, if the purpose of the targeted surveillance program is to detect the potential arrival of a new pathogen, you may want to target animals that show clinical signs of the pathogen or infection. In this case, you simply want to know if the pathogen is present in the population or not. The subgroup of animals in the population that is showing typical clinical signs is more likely to be infected with the pathogen of interest than is the much larger subgroup of animals that are apparently healthy. If you relate this back to the earlier discussion of diagnostic tests, you are effectively increasing the true prevalence in the population of interest, and therefore the laboratory test being used in the surveillance program is better able to predict infection (better positive predictive values).

If the purpose of the Targeted wildlife disease surveillance program is to determine pathogen prevalence for the population, then the sampled animals should be as similar as possible to the whole population i.e. if the population is 60% female, then ideally 60% of the sampled animals would also be female. It is not easy to get a representative sample of a wild animal population.

Ideally, to ensure that the sampled animals are representative of the whole population, a random sampling approach should be used. In a random sample, every animal or group of animals has an equal chance of being selected. Unfortunately, truly random sampling is rarely possible in the case of wild animal surveillance. Also, typically there is limited information about the population of interest, including the accurate estimates of the number of animals, sex, age or where they are located.

Random Sampling

There are several ways in which a random sample can be obtained. Three of the most common are:

- Simple random sampling - e.g. flipping a coin
- Stratified sampling– particular habitats or groups of animals are identified (e.g. hedgerows, woodlands or known herds) and then a simple random sample is taken from each group
- Cluster sampling – particular groups are randomly selected and then all animals within the selected groups are sampled.

For many reasons, however, in surveillance of wild animals, non-random (non-probability) sampling often is used. Non-probability sampling is not necessarily bad; it is simply important to recognise that such samples may not be representative of the overall population of interest and that this will affect how the data can be interpreted.

How will the required samples be acquired?

In Targeted surveillance programs, usually a specific animal species (or group of species) is targeted because those species are known or believed to be able to carry the pathogen of concern. In some situations, samples (e.g. blood/serum, feces) are collected from live or live trapped animals. In other cases, you rely on dead animals for targeted surveillance, such specimens may be available from hunters.

The particular pathogen of interest will influence what samples are appropriate for testing (e.g. brain for chronic wasting disease, feces for avian influenza), or whether or not samples can be collected from live animals. The particular pathogen will also determine how the sample should be handled and who and what facilities exist that can handle the sample and carry out the testing. The quality of the samples collected and how they are handled will influence the reliability of any laboratory results obtained.

All of the considerations described above need to be balanced against what resources are available to carry out the surveillance program.

Bias

Anytime a sample is taken from a population, there is a possibility that bias will be introduced. A biased sample is one that is systematically different from the population as a whole. For example, if samples are collected from hunters, the animals that they kill may not be representative of the whole population of interest. Hunters may preferentially select for larger, healthier animals from a population. The samples may be from older animals or be more of one sex than another. If animals are live trapped and samples are obtained, the animals trapped may be different from the overall population in some manner. All of these differences introduce bias into the surveillance findings and need to be considered in the interpretation and communication of the results. The best way to minimise bias is to take a random sample of the population. Unfortunately this is often not possible in wildlife surveillance programs.

Targeted Surveillance Scenarios for Atlantis: Data Review and Analysis

ACTIVITY 5

Review and Analysis of Targeted Surveillance Data

Data from two different Targeted wildlife surveillance programs in Atlantis are provided for use in the following exercises. The two Targeted surveillance programs and the data sets for each are very different and explore different aspects of Targeted wildlife disease surveillance; you may choose just one or you may carry out the exercise twice, once with each set of data. One program was designed to determine the prevalence of a new strain of rabies virus (Scenario TS1), in order to determine whether or not a control strategy needs to be implemented; the other was designed to demonstrate that Atlantis is free of foot and mouth disease (Scenario TS2).

The data are in separate Excel files entitled: Data Targeted Surveillance 1 and Data Targeted Surveillance 2. Download and save a copy of the spreadsheet(s) on your computer. These files can be downloaded from the OIE website. If you introduce errors into the data on your computer, you can delete that file, and download another copy and start over.

To complete the exercises, you will also need to review the background information about each Targeted surveillance program, as well as the maps and charts that were created from the data provided in the Excel data files. All of the required information is provided in Appendix D.1 for Targeted Surveillance 1 and Appendix D.2 for Targeted Surveillance 2.
To begin, review and describe the data provided (i.e. what animal species were tested, how were they caught, where and when were they sampled, etc...) and then answer the following questions:

1. What errors or inconsistencies did you find in the datasets?

[write here]

2. What patterns are present in the data? (Spatial, temporal, other...)

[write here]

3. Do you have all the data that you need to interpret the information provided and meet the stated objectives of the targeted surveillance program? If not, make a list of the additional information that is needed.

[write here]

4. Are there any important biases that would affect how you interpret the targeted surveillance data results? Describe how the data might be biased and whether or not this is a problem.

[write here]

5. What are the important surveillance findings? How should these findings be reported to the OIE? Who else should be informed about the surveillance findings?

Review Chapter 1.1 of the OIE Terrestrial Animal Health Code (http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_notification.htm)

[write here]

Targeted Surveillance in Atlantis: Capacity to meet its objectives?

ACTIVITY 6

Is the Targeted Surveillance Program able to meet its Stated Objectives?

Review the one or both of targeted surveillance datasets provided. Are the data provided adequate to meet the stated objectives for each program? (see Appendix D for descriptions of the two Targeted surveillance programs)

Consider what each program was designed to do.

- Are the data that have been gathered in each of the two programs adequate to meet the stated objectives?
- How would you improve the program?

[write here]

Appendix A

The *Dominion of Atlantis,* General Information

(This country does **not** exist)

The *Dominion of Atlantis* is a parliamentary democracy with a capitalist economy.

Economy

- Mostly self-sufficient in food production, 10% export balanced by 10% import
- Main sources of wealth:
    - Agricultural products
        - Major exports of poultry, cheese, farmed mink pelts and wine
    - Forest products for export
    - Tourism
        - Wildlife viewing, seaside and forest natural environments, hunting and fishing
        - Important wildlife populations for tourism include
            - White-tailed Deer – 30,000
            - Moose – 2,000
            - Bald Eagles – 800
            - Black Bears – 3000
    - Commercial seafood harvest for export (finfish & shellfish)
    - Wind and tide-generated electricity
    - Banking (tax haven)

Location: An island in the North Hibernian Ocean (see map on last page)

Human Population:

- 946,000 people
    - 40% rural
    - 60% in urban centres,
        - 43% in the capital city of Bigtown
- Wealth: Median Annual Family Income: US$30,000

Size: ~ 56,000 km^2 (~ 130 km x 560 km)

Climate: North Temperate

- Average summer temperature = +21C
- Average annual extreme temperatures: -10C to +28C
- Annual precipitation: 1,500 mm, (300mm as snow in winter)

Social Infrastructure:

- Relevant National Ministries/Departments:
    - Ministry of Health
        - Medical laboratory in Bigtown
        - 16 Regional Hospitals

  - Ministry of Agriculture & Aquaculture
    - Veterinary diagnostic lab in Epiville
    - 10 Regional Offices
  - Ministry of Natural Resources (Fish and Wildlife Department)
    - 18 Regional Offices
  - Ministry of Environment (Jurisdiction over Wilderness Areas and National Parks
    - 6 Regional Offices
  - Ministry of Ocean Resources (jurisdiction over ocean fish and marine mammals)
    - 18 Regional offices
  - Ministry of Tourism
    - Fishing, Hunting & Ecotourism Guide License Department
- Aboriginal Government
  - Anguille Original People's Council – Government for 20,000 aboriginal people which controls all resources on 5,000 km^2 of Atlantis, mostly adjacent to parks and wilderness areas. Special hunting and fishing rights extend to the whole country.
- Universities:
  - Harrison Lewis National University (20,000 students, Bigtown)
    - Includes Atlantis Veterinary College
  - 6 small (500 to 4000 students) regional universities distributed across country
- Non-Government Organizations:
  - National Farmers Association
  - Atlantis Natural History Club (naturalists)
  - National Fish and Game Association (recreational hunters and fishermen)
  - National Fishermen's Union (commercial ocean fisheries)
- Calliope International (animal rights and welfare association)

Appendix B

Appendix B.1: Charts and maps for General Surveillance 1

Dataset G1 Charts:

Chart G1 A: Number of dead animals by date, Atlantis 2015

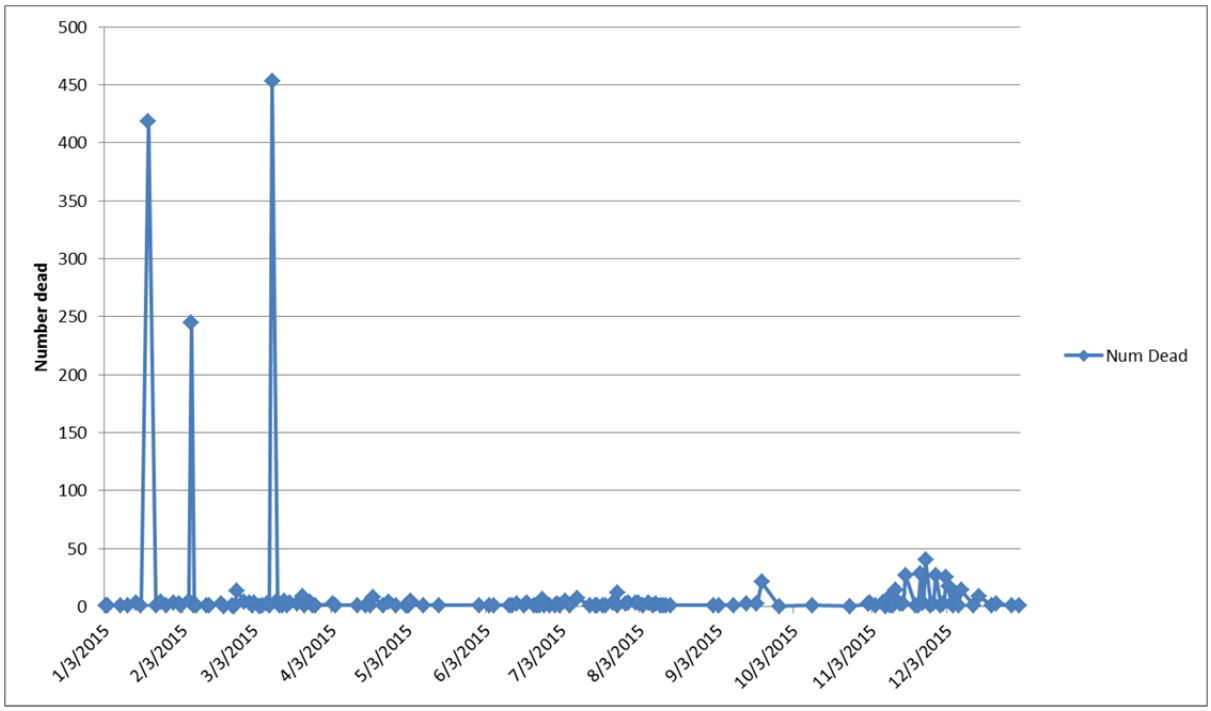


Chart G1 B: Number of animals that died of Avian Influenza H5N1 (Highly Pathogenic Strain), Atlantis November 1-December 15, 2015

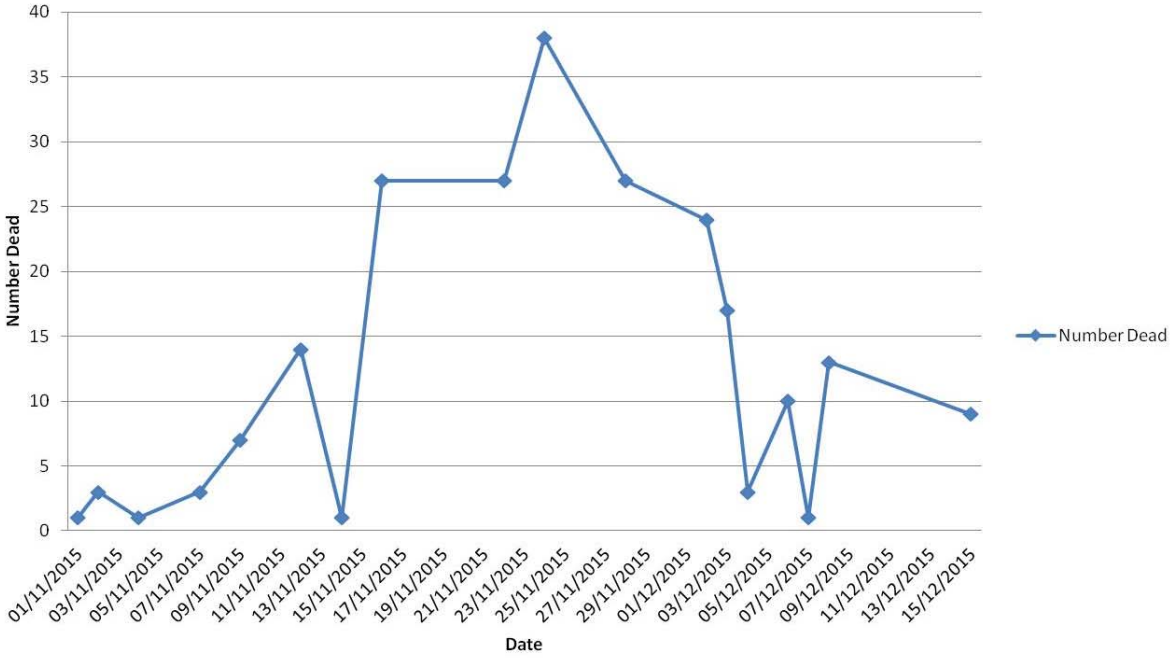


Chart G1 C: Number of crows that died of Reovirus, Atlantis January 15-February 26, 2015

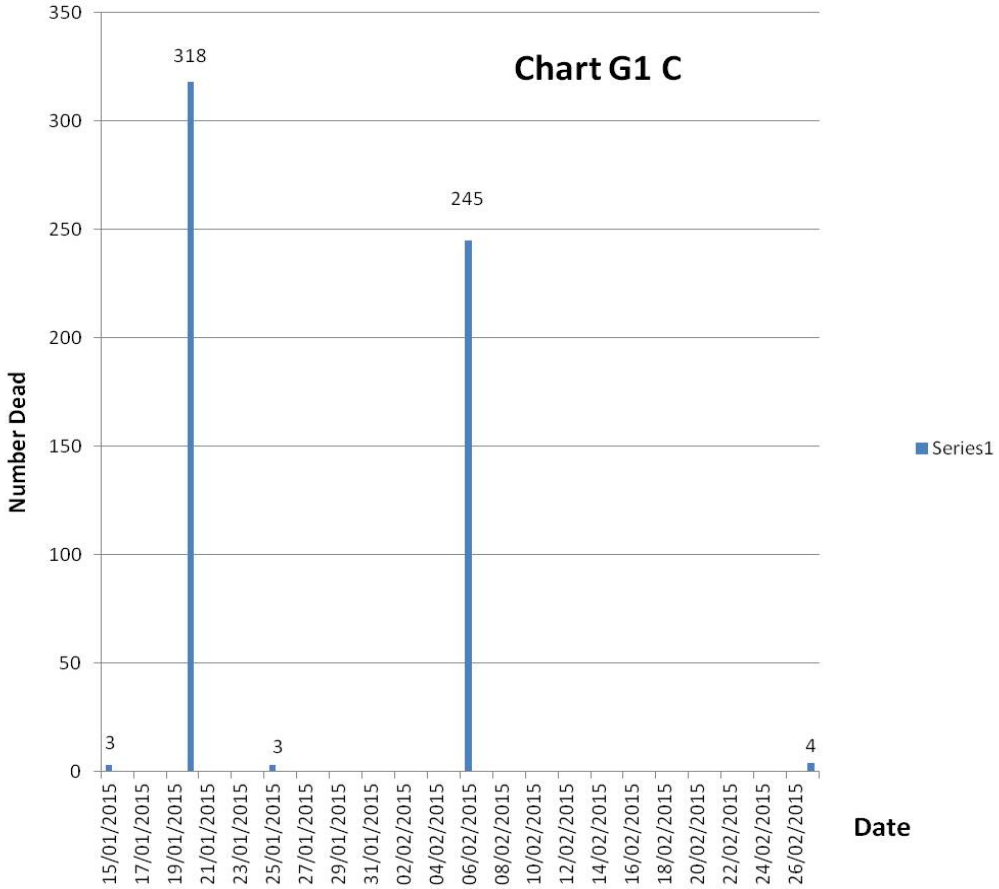
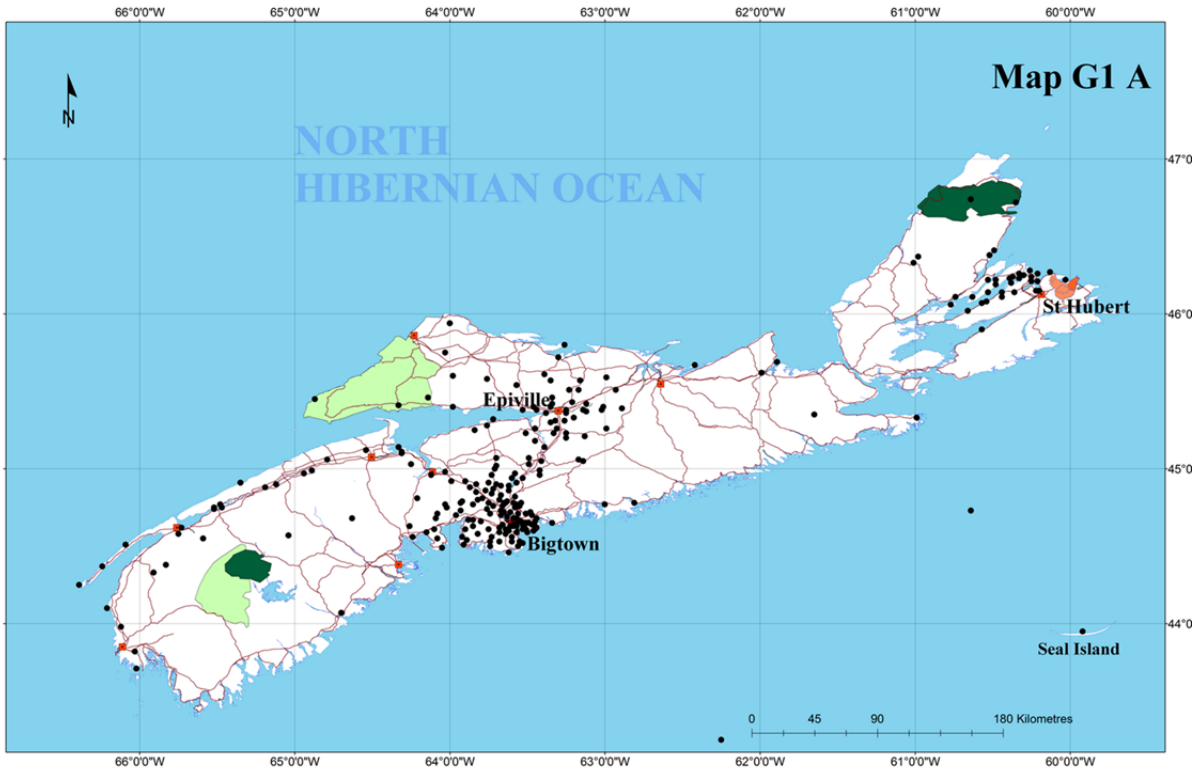
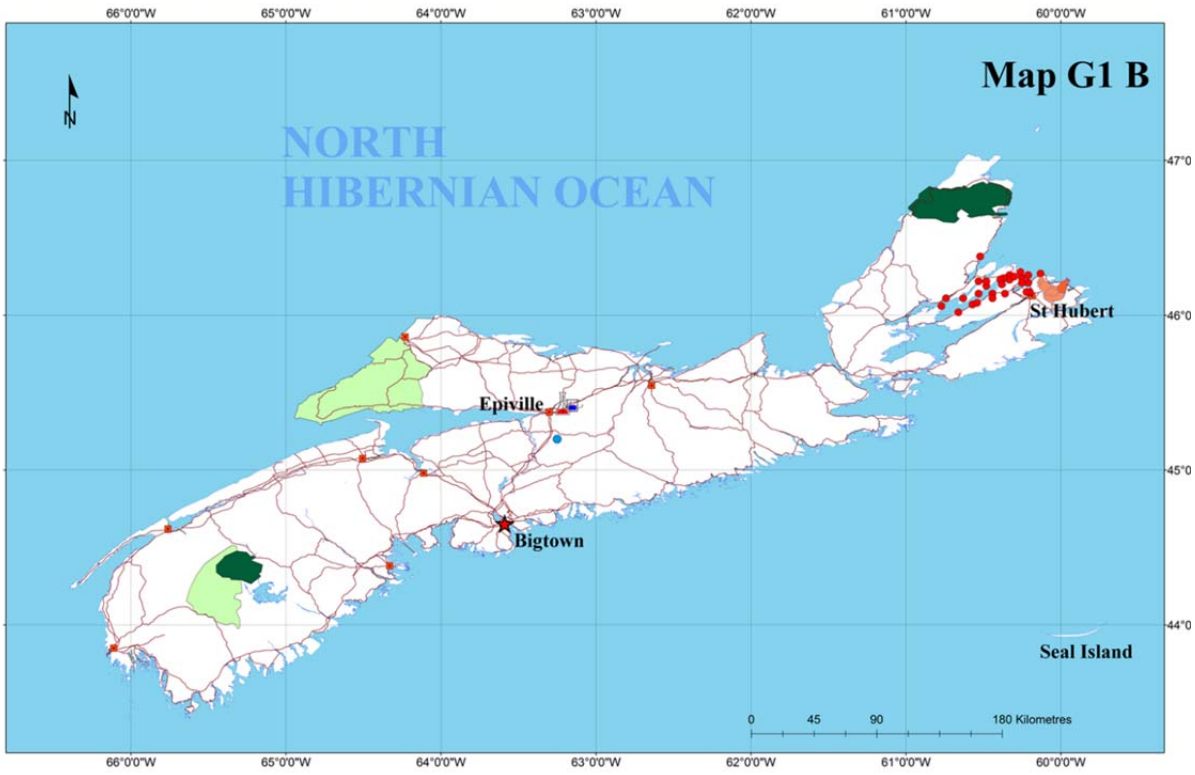
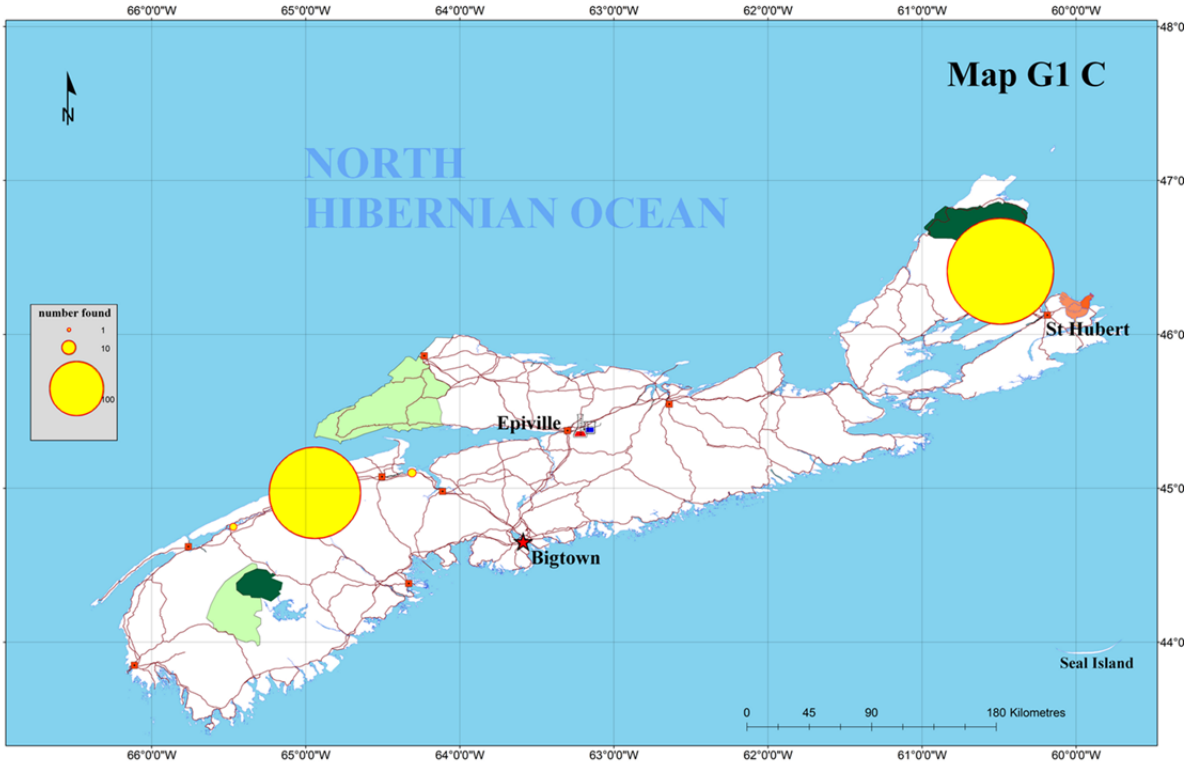


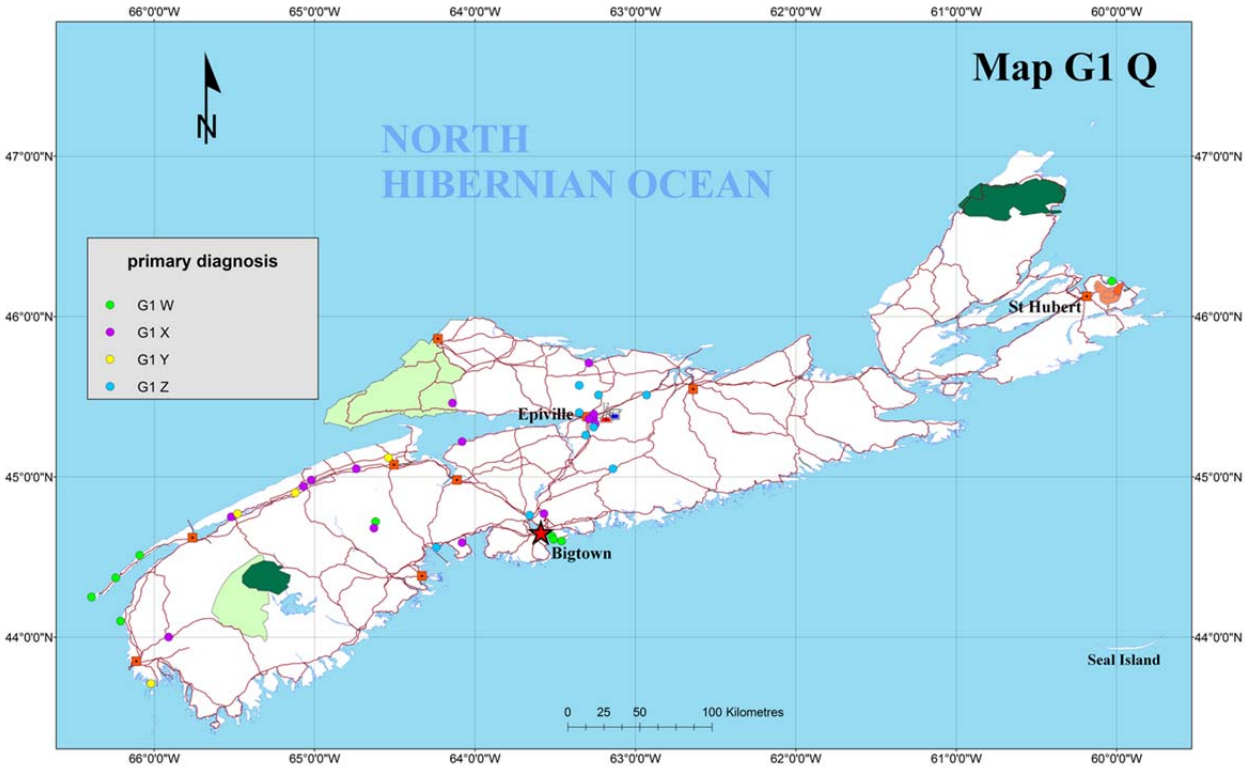
Chart G1 D: Number of animals that died of *Salmonella*, Atlantis March 3-March 27, 2015

Dataset G1 Maps:






Map G1 C
N
NORTH
HIBERNIAN OCEAN
number found
1
10
100
Epiville
Bigtown
St Hubert
Seal Island
0 45 90 180 Kilometres
66°0'0"W
65°0'0"W
64°0'0"W
63°0'0"W
62°0'0"W
61°0'0"W
60°0'0"W
48°0
47°0
46°0
45°0
44°0


Map G1 Q
N
NORTH
HIBERNIAN OCEAN
primary diagnosis
G1 W
G1 X
G1 Y
G1 Z
Epiville
Bigtown
St Hubert
Seal Island
0 25 50 100 Kilometres
66°0'0"W
65°0'0"W
64°0'0"W
63°0'0"W
62°0'0"W
61°0'0"W
60°0'0"W
47°0'0"N
46°0'0"N
45°0'0"N
44°0'0"N

Appendix B.2: Charts and maps for General Surveillance 2

Dataset G2 Charts:

Chart G2 A: Number of dead animals by date, Atlantis 2015

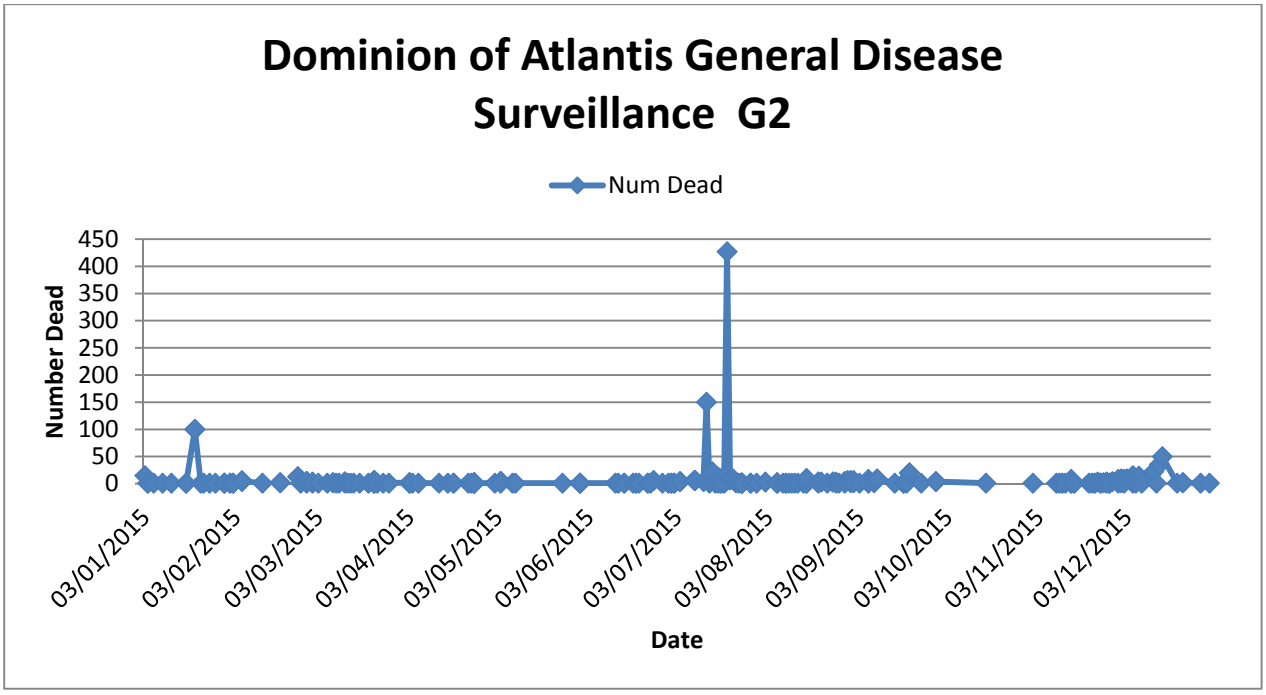


Chart G2 B: Number of dead animals from Saxitoxin poisoning (Harmful algal bloom), Atlantis August 15-September 9, 2015

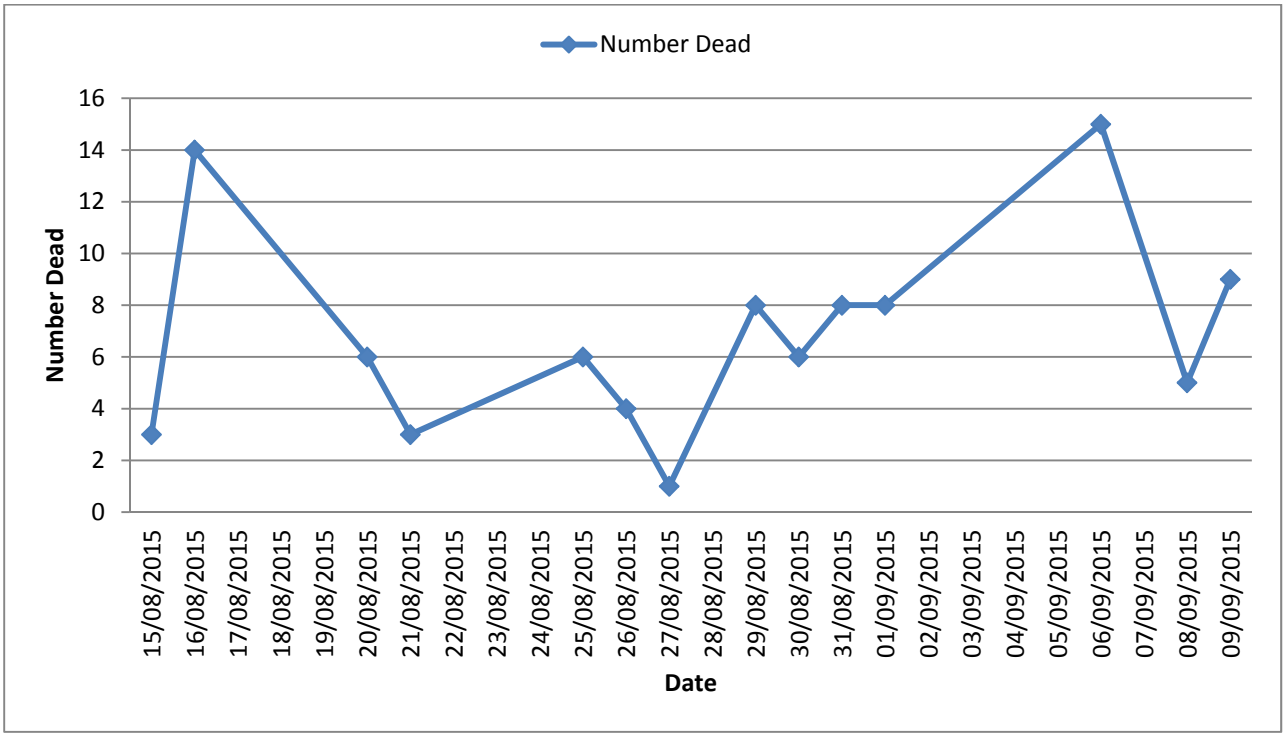


Chart G2 C: Number of animals dead of Newcastle disease (Highly pathogenic APMV-1), Atlantis June 23-August 22, 2015

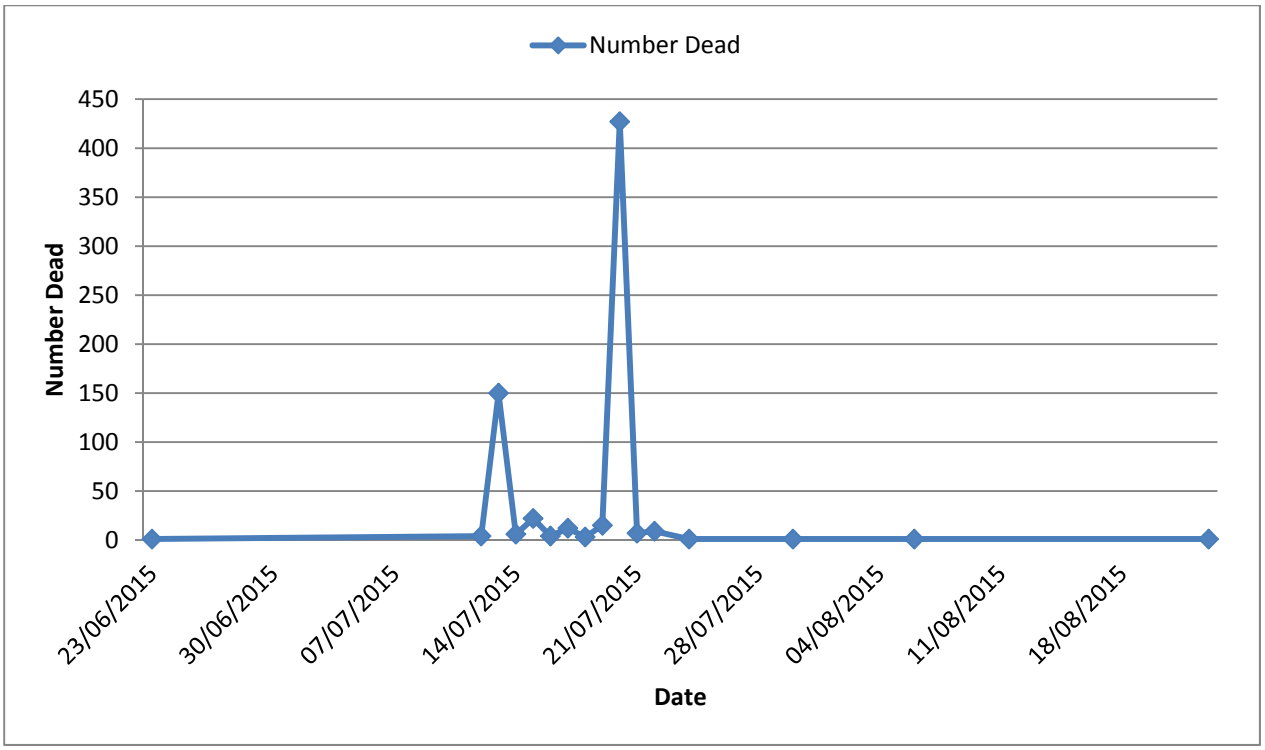
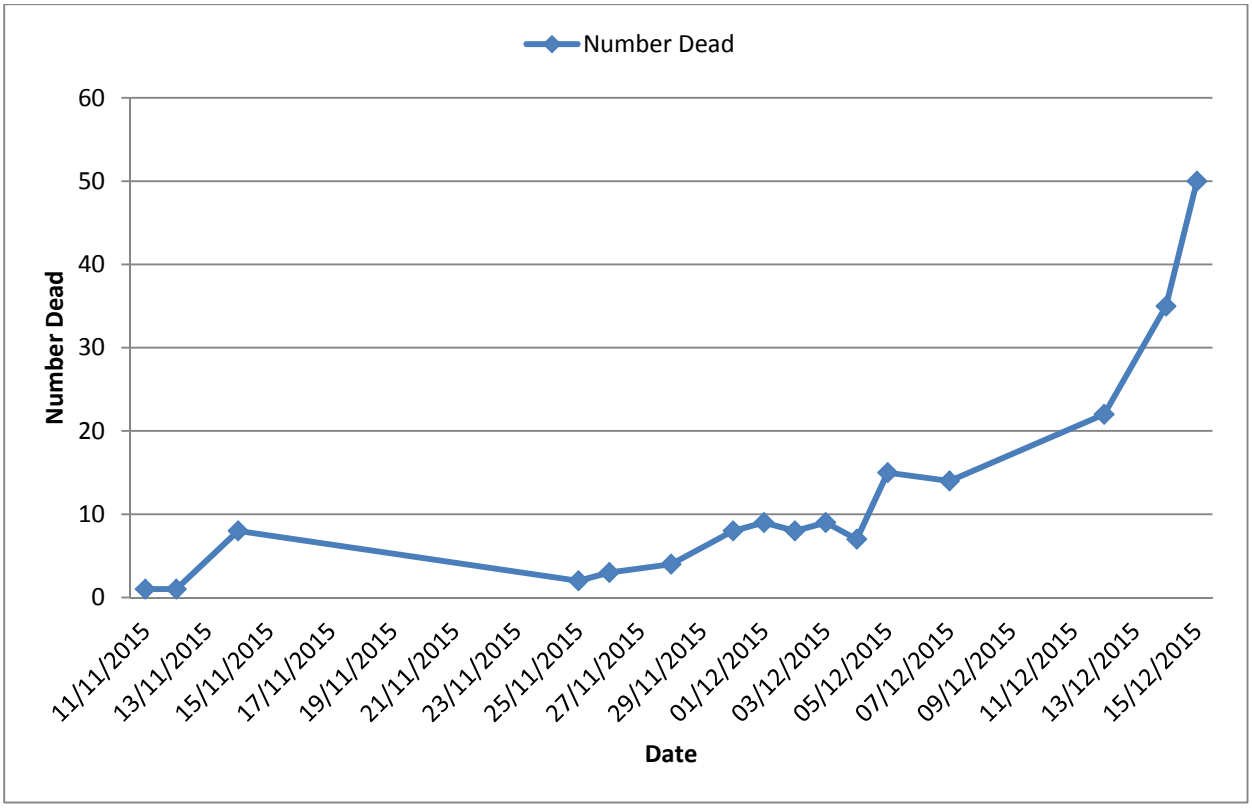
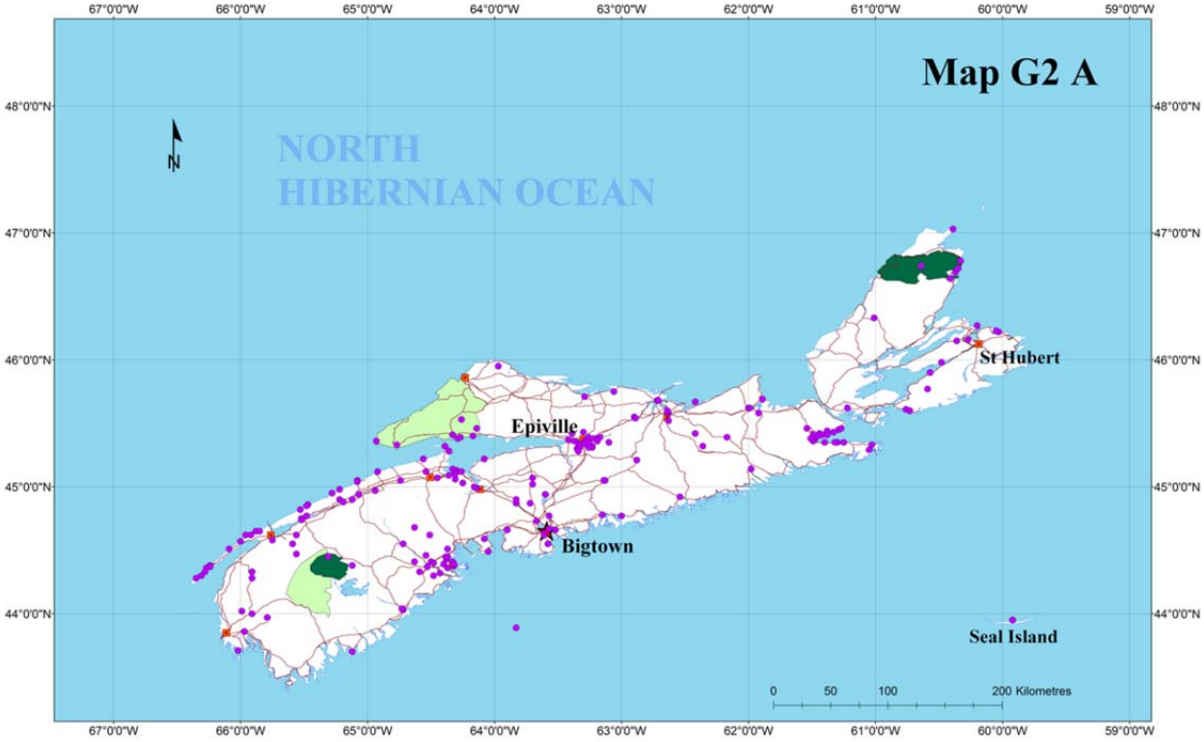
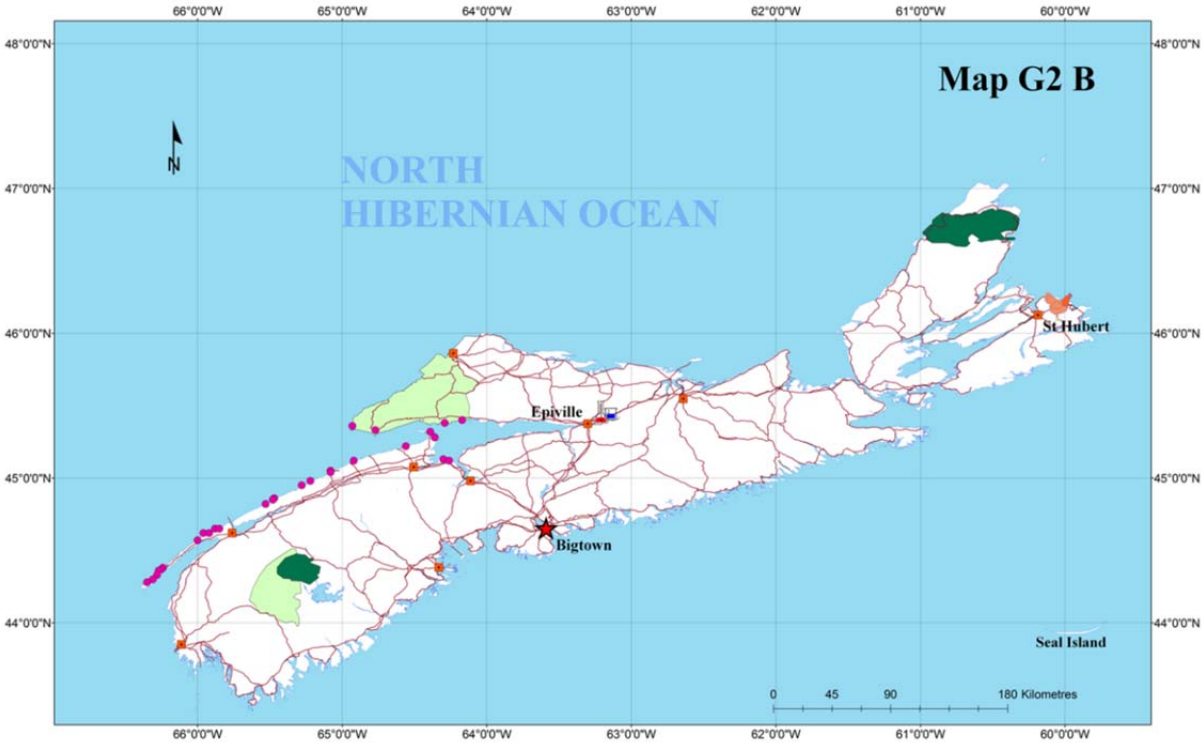


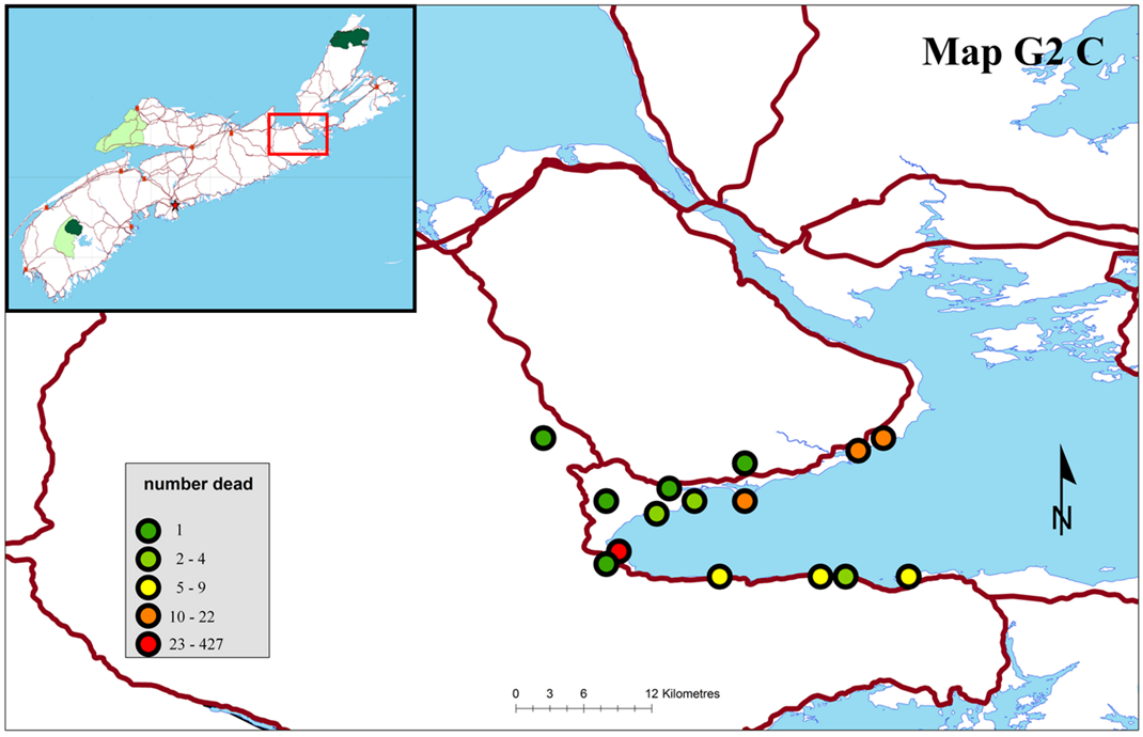
Chart G2 D: Number of animals that died of Morbillivirus infection, Atlantis November 11-December 15, 2015

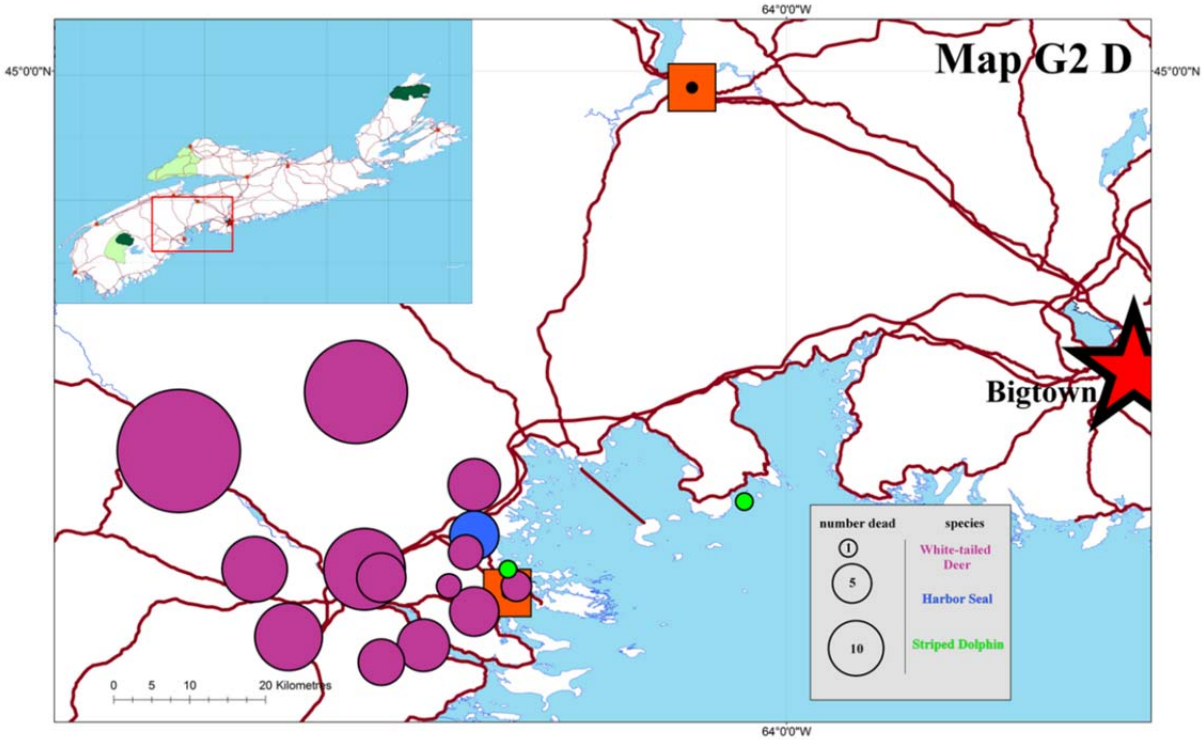


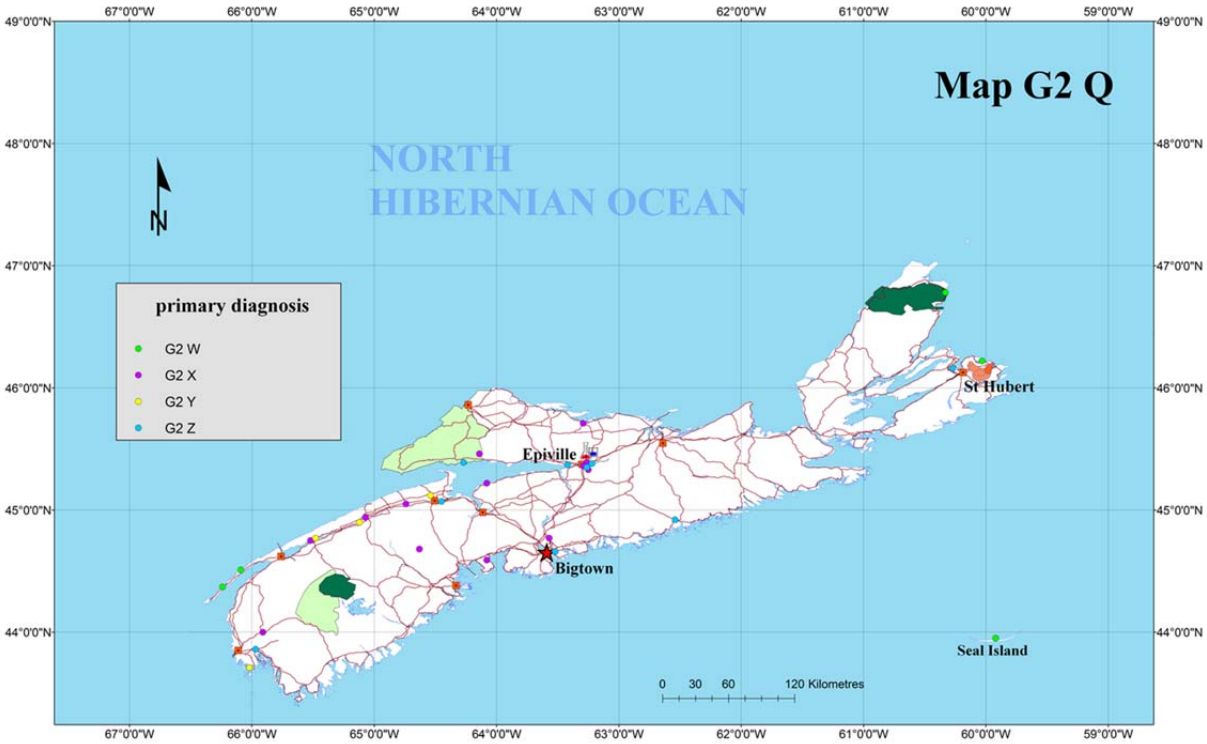
Dataset G2 Maps:






Map G2 C
number dead
1
2 - 4
5 - 9
10 - 22
23 - 427
N
0 3 6 12 Kilometres


64°0'0"W
45°0'0"N
Map G2 D
45°0'0"N
Bigtown
number dead
species
1
5
10
White-tailed Deer
Harbor Seal
Striped Dolphin
0 5 10 20 Kilometres
64°0'0"W


Map G2 Q
NORTH
HIBERNIAN OCEAN
N
primary diagnosis
G2 W
G2 X
G2 Y
G2 Z
Epiville
Bigtown
St Hubert
Seal Island
0 30 60 120 Kilometres
67°0'0"W
66°0'0"W
65°0'0"W
64°0'0"W
63°0'0"W
62°0'0"W
61°0'0"W
60°0'0"W
59°0'0"W
49°0'0"N
48°0'0"N
47°0'0"N
46°0'0"N
45°0'0"N
44°0'0"N

Appendix C

OIE Listed Diseases affecting wild animals

Anthrax
African horse sickness
African swine fever
Aujeszky's disease
Avian chlamydiosis
Avian infectious bronchitis
Avian infectious laryngotracheitis
Avian mycoplasmosis (*Mycoplasma gallisepticum*)
Avian mycoplasmosis (*Mycoplasma synoviae*)
Bluetongue
Bovine anaplasmosis
Bovine babesiosis
Bovine genital campylobacteriosis
Bovine spongiform encephalopathy
Bovine tuberculosis
Bovine viral diarrhoea
Brucellosis due to *Brucella abortus*
Brucellosis due to *Brucella melitensis*
Brucellosis due to *Brucella suis*
Caprine arthritis/encephalitis
Classical swine fever
Contagious agalactia
Contagious bovine pleuropneumonia
Contagious caprine pleuropneumonia
Contagious equine metritis
Crimean Congo haemorrhagic fever
Dourine
Echinococcosis/hydatidosis
Enzootic abortion of ewes (ovine chlamydiosis)
Enzootic bovine leukosis
Epizootic haemorrhagic disease
Equine encephalomyelitis (Eastern)
Equine encephalomyelitis (Western)
Equine infectious anaemia
Equine influenza
Equine piroplasmosis
Equine rhinopneumonitis
Equine viral arteritis
Foot and mouth disease
Fowl cholera
Fowl typhoid
Glanders
Haemorrhagic septicaemia
Heartwater
Highly pathogenic avian influenza
Infectious bovine rhinotracheitis/infectious pustular vulvovaginitis
Infectious bursal disease (Gumboro disease)
Japanese encephalitis
Leishmaniosis
Leptospirosis
Lumpy skin disease
Maedi–visna
Marek's disease
Myxomatosis
Nairobi sheep disease
New world screwworm due to *Cochliomyia hominivorax*
Newcastle disease
Nipah virus encephalitis
Old world screwworm due to *Chrysomya bezziana*
Ovine epididymitis due to *Brucella ovis*
Paratuberculosis
Peste des petits ruminants
Porcine cysticercosis
Porcine reproductive and respiratory syndrome
Pullorum disease
Q fever
Rabbit haemorrhagic disease
Rabies
Rift Valley fever
Rinderpest
Salmonellosis due to S. abortusovis
Scrapie
Sheep pox and goat pox
Surra (*Trypanosoma evansi*)
Swine vesicular disease
Theileriosis
Transmissible gastroenteritis
Trichinellosis
Trichomonosis
Trypanosomosis (tsetse-transmitted)
Tularemia
Venezuelan equine encephalomyelitis
Vesicular stomatitis
West Nile fever

Amphibians (Aquatic OIE listed diseases)

Infection with *Batrachochytrium dendrobatidis*
Infection with ranavirus

Non-OIE listed diseases affecting wildlife

Arboviruses	Measles
Avian Malaria	Meningeal worms of cervids
Avian Pox	Morbillivirus infection in aquatic mammals
Avian Vacuolar Myelinopathy	Paramyxoviruses
Babesiosis	Pasteurellosis
Baylisascaris procyonis	Pestiviruses
Besnoitiosis	Pseudotuberculosis
Calicivirus Marine Mammals	Psoroptic Mange
Canine distemper	Salmonellosis (*S. enterica*)
Chronic wasting disease (CWD)	Sarcoptic Mange
Circoviruses	Plague
Contagious Ecthyma	Tick Borne Encephalitis
Ebola Virus Hemorrhagic Fever (EVHF)	Toxoplasmosis
Elephant Herpesvirus	Trasmissible Mink Encephalopathy (TME)
European Brown Hare Syndrome (EBHS)	Trichomonas sp.
Feline Leukaemia (FLV)	Tyzzer´s Disease
Feline morbillivirus infection	White-nose syndrome in bats
Feline Panleucopenia	**Reptiles**
Hantaviruses	Inclusion Body Disease
Histomoniasis	Fibropapillomatosis in sea turtles
Immunodeficiency viruses (Feline, Simian)	Papillomatosis in crocodiles
Inclusion Body Hepatitis	Trichinellosis
Large Liver Flukes	**Non-Infectious Diseases**
Listeriosis	Algal toxicosis
Louping ill	Botulism
Low pathogenic avian influenza	Chemical poisons
Lyme borreliosis	Mycotoxins
Malignant catarrhal fever	**Diseases of Unknown Cause**
Marburg virus	Unknown disease

Appendix D

Appendix D.1:
Targeted Surveillance Scenario TS1 - Rabies in Atlantis

Background and Design

Early in the summer of 2014, a coyote (*Canis latrans*) in Kejimkujik National Park was found dead and submitted to the General wildlife surveillance program. The cause of death was determined to be rabies and the virus detected appeared to be a new coyote-adapted strain that had not been detected in the country before. Within a few weeks of the first diagnosis, 4 more coyotes tested positive for the new rabies strain and there were multiple reports of coyotes across south-western Atlantis exhibiting abnormal behaviour. Additionally, 2 dogs in Bigtown were euthanized because they were suspected of being infected with rabies and neither had been vaccinated. Both had traveled recently to Kejimkujik National Park. Both dogs were confirmed positive for the same new rabies strain and 22 people in Bigtown required post exposure prophylaxis.

Because of the public health concern posed by rabies, particularly a new virus strain, an inter-agency group was formed to investigate the occurrence. The group determined that they needed more information about the virus, how wide-spread it is (prevalence, geographic distribution) and which species were primarily affected. A targeted surveillance program for rabies was initiated in 2015. Based on the data generated through targeted surveillance, the country could then decide whether or not a control program was needed. It was decided that the surveillance program should be designed so that, if a control program was implemented, the data could also be used to evaluate the success of the control program.

Purpose of the Targeted rabies surveillance in Atlantis:

1) To determine how wide-spread the new coyote-adapted strain of rabies is in Atlantis
2) To identify what species are involved
3) To generate the information needed to determine whether or not a control program is needed

Which wildlife species were included in the Targeted wildlife disease surveillance program?

Because the new rabies strain was first identified in coyotes, they were targeted for inclusion in the surveillance program. However, the main reservoir for rabies in Atlantis has traditionally been the raccoon (*Procyon lotor)* and so a decision was made to include raccoons as well.

Where and when was Rabies virus surveillance carried out?

Because of the need to gather as much data as possible about this new strain of rabies, coyotes and raccoons were trapped and submitted for testing all year. As the original case was identified in Kejimkujak, this was considered to be the centre of the outbreak and coyotes and raccoons within 150km of the park were included in the surveillance program.

Which wildlife sub-groups were targeted?

All coyotes and raccoons, regardless of age or sex, were included in the targeted surveillance program.

How were the animals caught and samples collected?

Commercial hunters and trappers, and recreational hunters were recruited to assist in sample collection. Participating hunters and trappers brought the animals to the nearest offices of the Ministry of Natural Resources and trained biologists removed the heads and submitted them to the Epiville lab for virus identification. The name and contact details of the hunters and trappers were recorded along with the specimen ID code so that they could be informed of the laboratory results and seek out appropriate treatment should the animal be confirmed to be rabid (data not provided).

A public education campaign was also launched warning people about the risk to humans and domestic animals posed by rabies in wildlife. At the same time, the public was asked to report coyotes and raccoons they found dead to their nearest Ministry of Natural Resources office. A technician then picked up the animal and submitted its head to the lab for testing.

Based on the results of General surveillance, the Atlantis epidemiologists estimated that the prevalence of rabies in coyotes was 10%; they further estimated that the prevalence in raccoons could be as high as 2%.

Test characteristics:

At the Epiville lab, the fluorescent antibody test is used to determine whether or not an animal is infected with rabies virus. This test is reported to have a sensitivity of 96.3% and specificity of 98.4%. All positive brain samples are then tested by real time RT-PCR to determine the strain-type. All the positive animals detected in Atlantis in 2015-2016 were determined to have the new coyote-adapted strain (data not shown).

Scenario TS1 Charts:

Chart 1: Number of coyotes and raccoons submitted for rabies testing in Atlantis by year

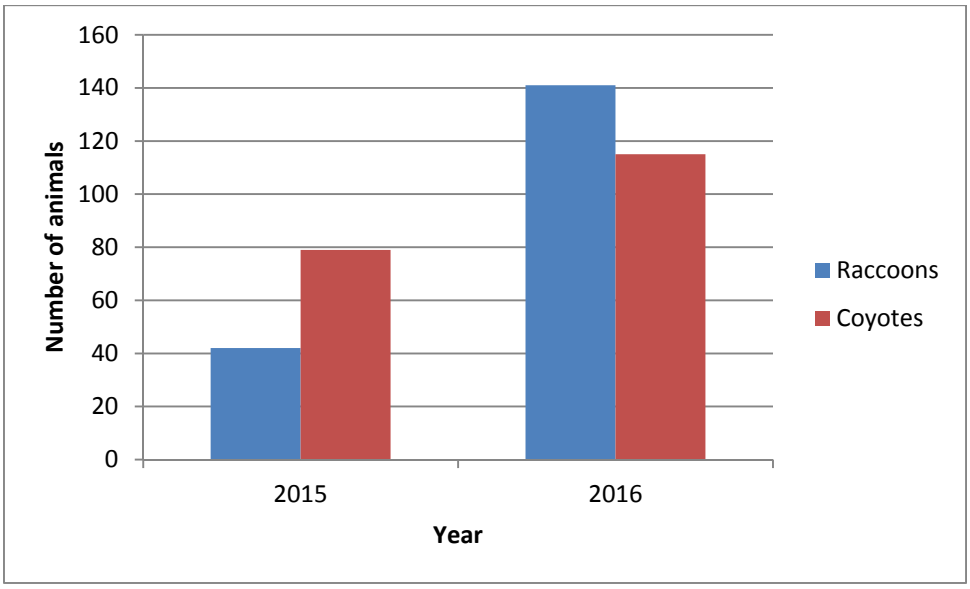


Chart 2: Number of coyotes and raccoons tested for rabies by month (2015-2016)

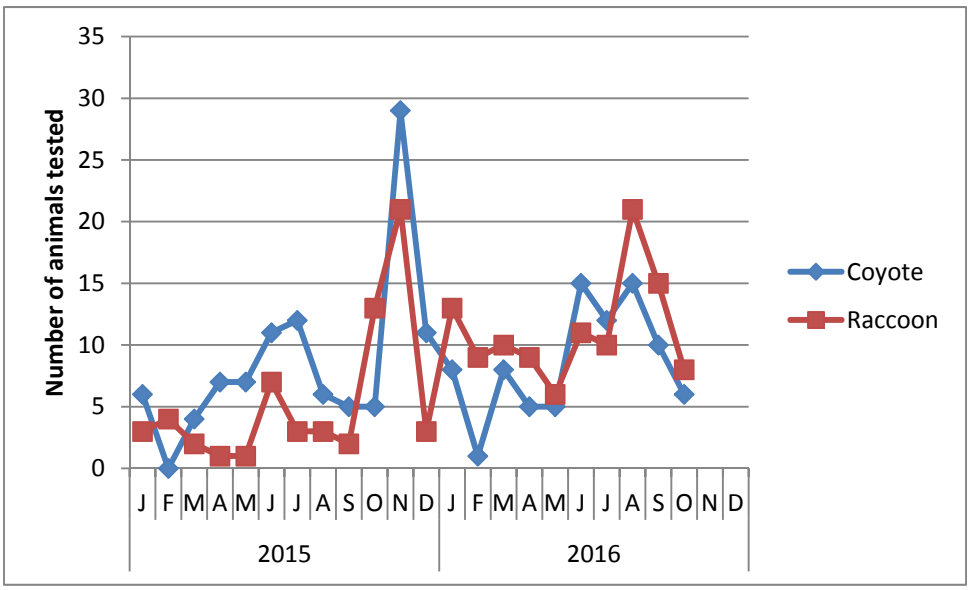


Chart 3: Proportion of raccoons and coyotes tested for rabies that were male, female or of unknown sex, 2015-2016

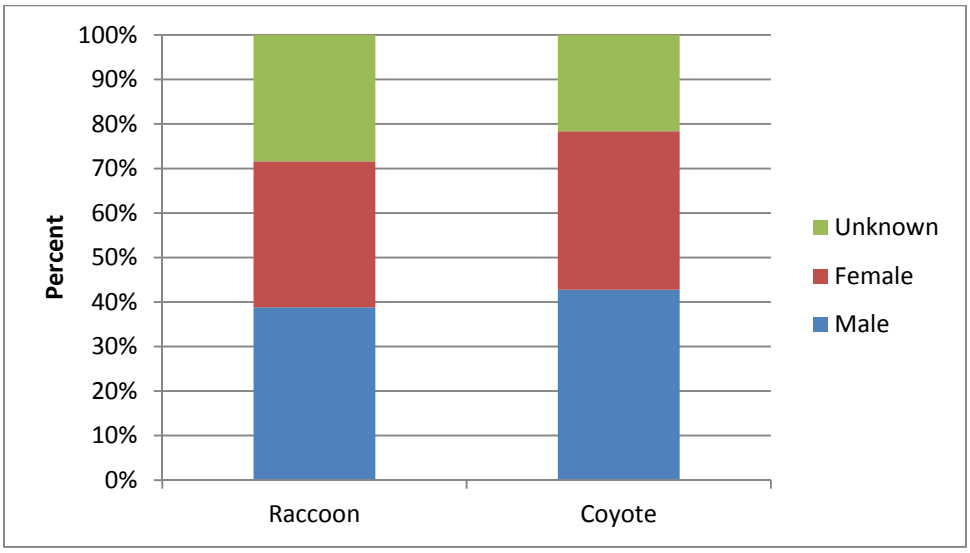


Chart 4: Number of coyotes and raccoons tested for rabies by age category, 2015-2016

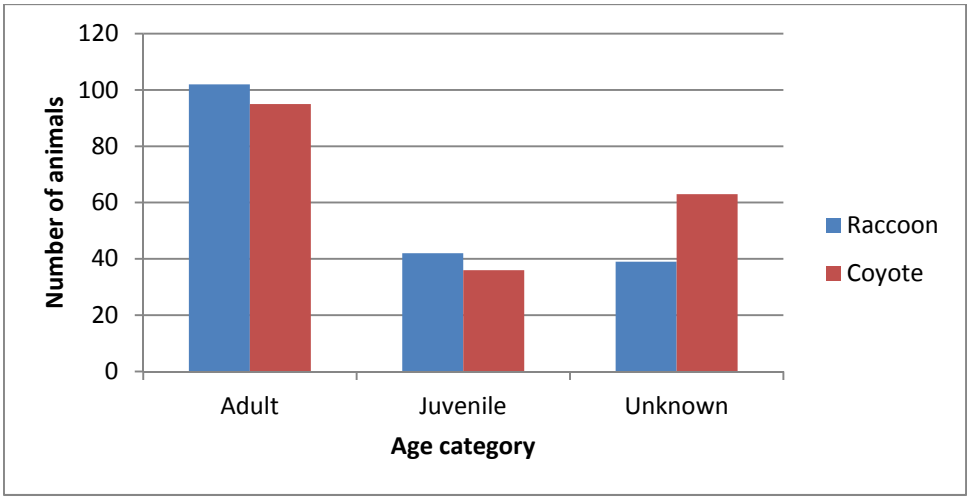
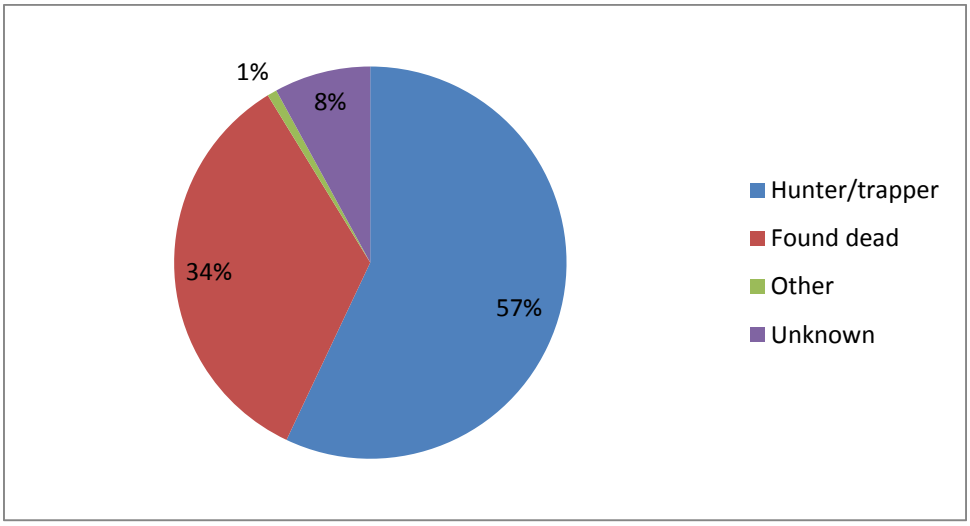
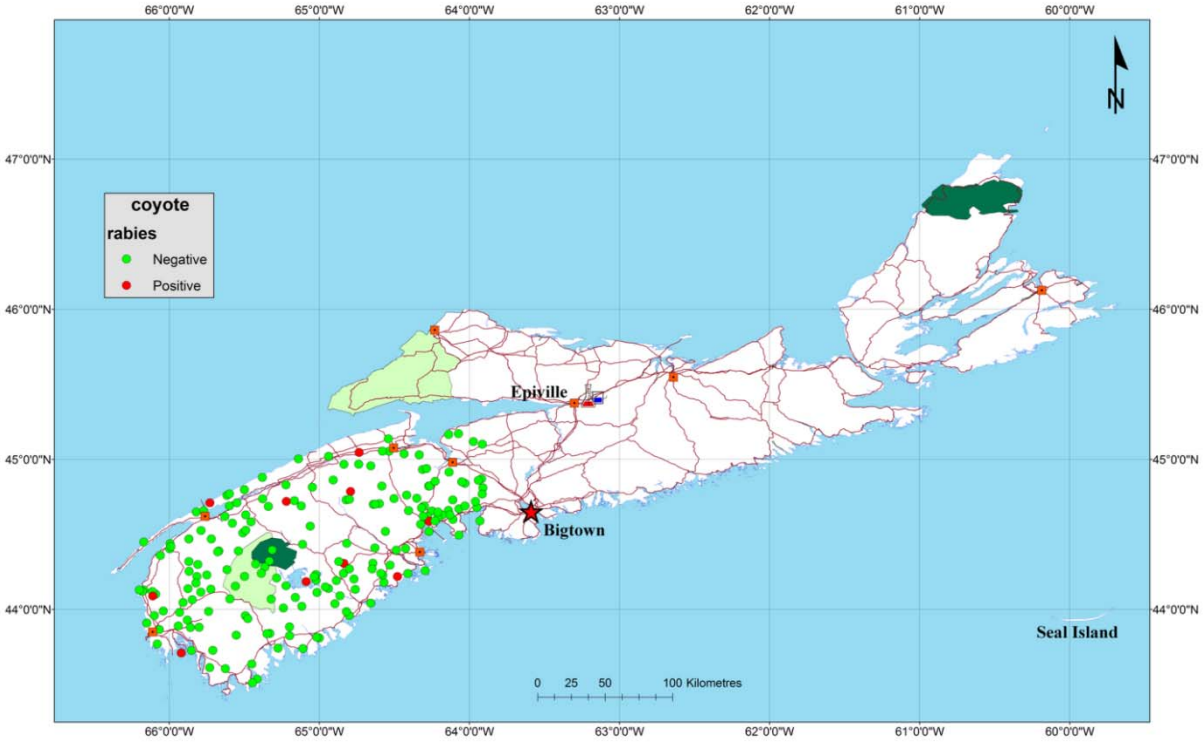


Chart 5: Proportion of animals submitted for rabies testing by how they were found, 2015-2016

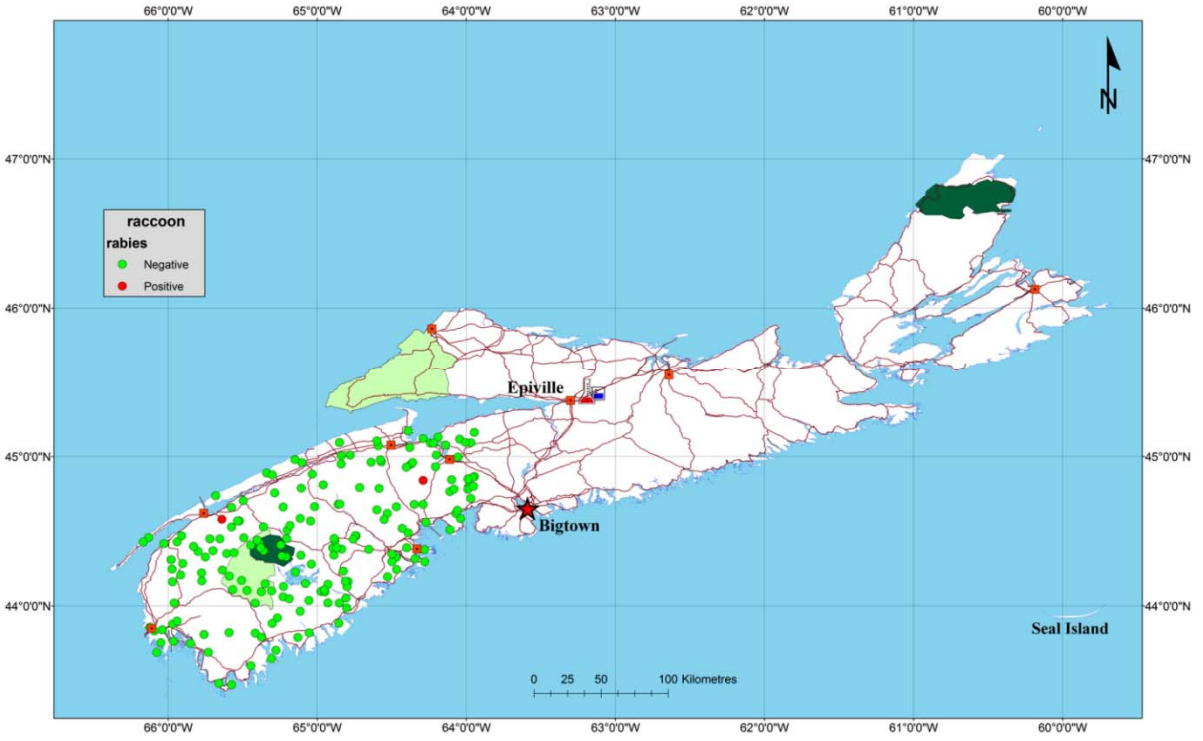


Scenario TS1 Maps:

Map 1: Atlantis rabies surveillance results – raccoons 2015-16



Map 1: Atlantis rabies surveillance results – coyotes 2015-16



Appendix D.2: Targeted Surveillance Scenario TS2 - Foot and Mouth Disease in Atlantis

Background and Design:

Over the past 10 years, reports have been released from other nations, some of which are not far from Atlantis. Of particular concern to the wildlife managers and agricultural health experts was a In 2012, the country of Borduria, located about 230 km from Atlantis across the Hibernian Ocean, reported to the OIE that Foot-and-Mouth Disease (FMD) had been detected and confirmed in wild deer. There is a busy shipping route between Borduria and Atlantis, and in the winter the ocean is frequently ice covered, providing a potential corridor for wildlife movement between the two countries. Because of the important livestock health and trade issues posed by FMD, Atlantis began a targeted wildlife disease surveillance program for FMD in 2013.

Purpose of the Surveillance program: The purpose of this targeted wildlife disease surveillance program was to detect Foot-and-Mouth disease virus if it emerges in wildlife in Atlantis and, if no virus is detected, to demonstrate that Atlantis remains free of Foot-and-Mouth disease.

Which wildlife species were included in the Targeted wildlife disease surveillance program?

In Atlantis there are 2 wild deer species: white-tailed deer (*Odocoileus virginianus*) and moose (*Alces alces*). The deer population is large but the moose population is much smaller (Table 1). Both species are hunted. The other susceptible wild species in Atlantis is wild boar (*Sus scrofa*). Boar were excluded from the targeted surveillance program because of their small population and because of difficulty obtaining samples.

Table 1: Number of free-ranging white-tailed deer and moose by Wildlife Management Area* and species in Atlantis (data from Atlantis Ministry of Natural Resources, 2013)

Year	Deer				Moose			
	Total	Borderry	CL[1]	ML[2]	Total	Border	CL[1]	ML[2]
Minimum	146130	84420	61710	39200	6500	3230	1125	2145
Maximum	349120	177550	103320	68250	9100	4785	1684	2631

*Wildlife Management Areas are shown in Map 1 below.
[1]CL=Cristolen
[2]ML=Mellen

Where and when was Foot-and-Mouth Disease virus surveillance carried out?

While planning the targeted surveillance program in early 2013, it was decided that the easiest way to access serum samples from deer and moose was by engaging hunters in the surveillance program. Consequently, the majority of samples were collected between September and December in each year (these are the hunting season months in Atlantis). Additional deer and moose found dead or that were hit by cars throughout the year were also tested for Foot-and-Mouth disease virus.

Which wildlife sub-groups should to targeted?

All deer and moose, regardless of age or sex, were included in the targeted surveillance program.

How were the animals caught and samples collected?

Deer and moose hunters were recruited to assist in sample collection. With each hunting license, a sample collection kit, including a data sheet, was distributed. Each hunter was asked to collect a blood sample in the vial provided. The vial and the data sheet were then submitted to surveillance program staff at hunting check points throughout the country; serum was separated from the whole blood and was frozen until tested. The check points were active from September to December of each year. When possible, all deer and moose found dead and reported through the general surveillance system were also tested (using the same specimen collection method). Conservation Officers working for the Ministry of Natural Resources collected these additional specimens.

Test characteristics:

Serological testing (for antibody) was used for the FMD targeted surveillance program in Atlantis. An ELISA for non-structural proteins (NSP) was applied to determine whether or not the animal had been exposed to Foot-and-Mouth disease virus. In cattle, this test has an average sensitivity of 88% and average specificity of 91%. Unfortunately, the test has not been validated for deer or moose.

Scenario TS2 Charts:

Chart 1: Number of cervids sampled and tested for Foot-and-Mouth disease virus, Atlantis 2013-2016

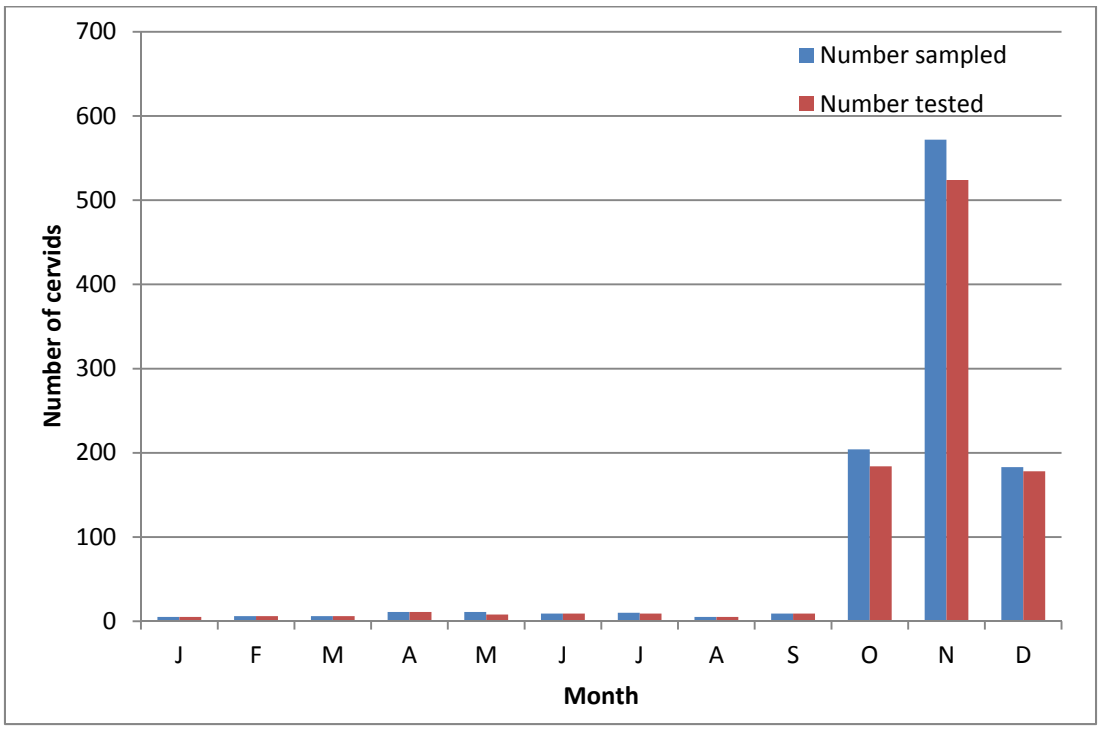


Chart 2: Number of animals submitted from each of the Atlantis Wildlife Management Areas by year

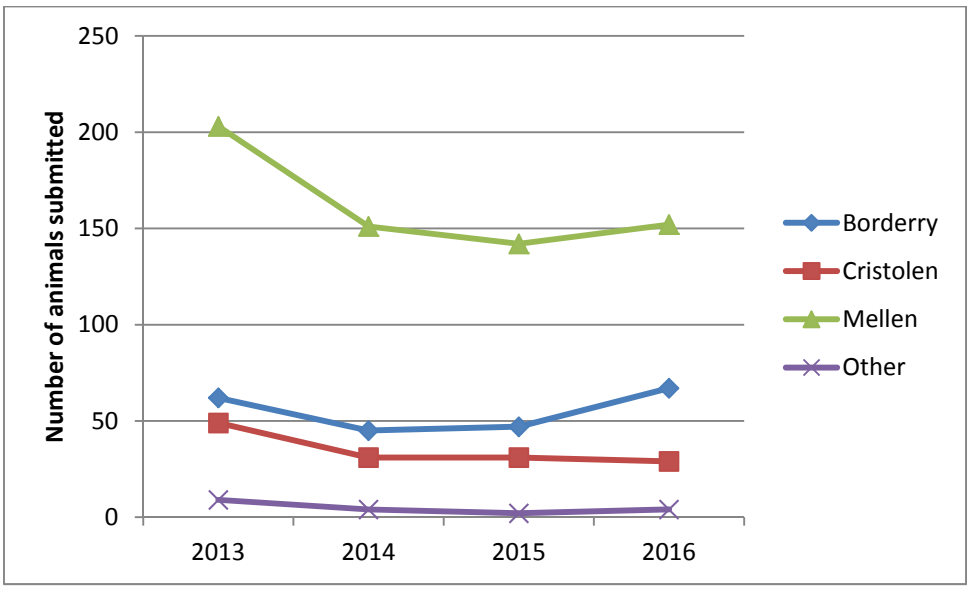


Chart 3: Proportion of cervids submitted for FMD testing by how they were found, 2013-2016

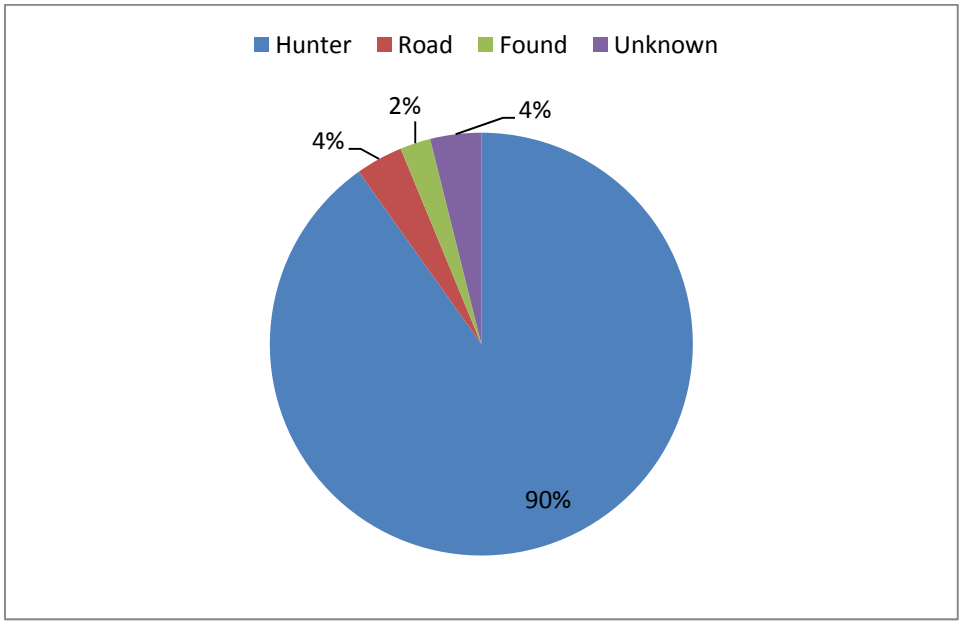
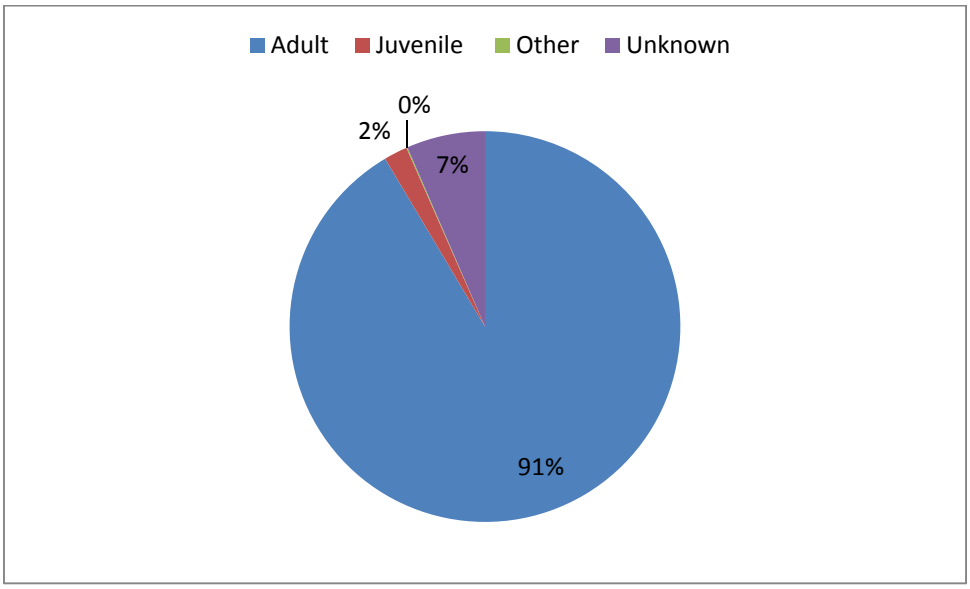
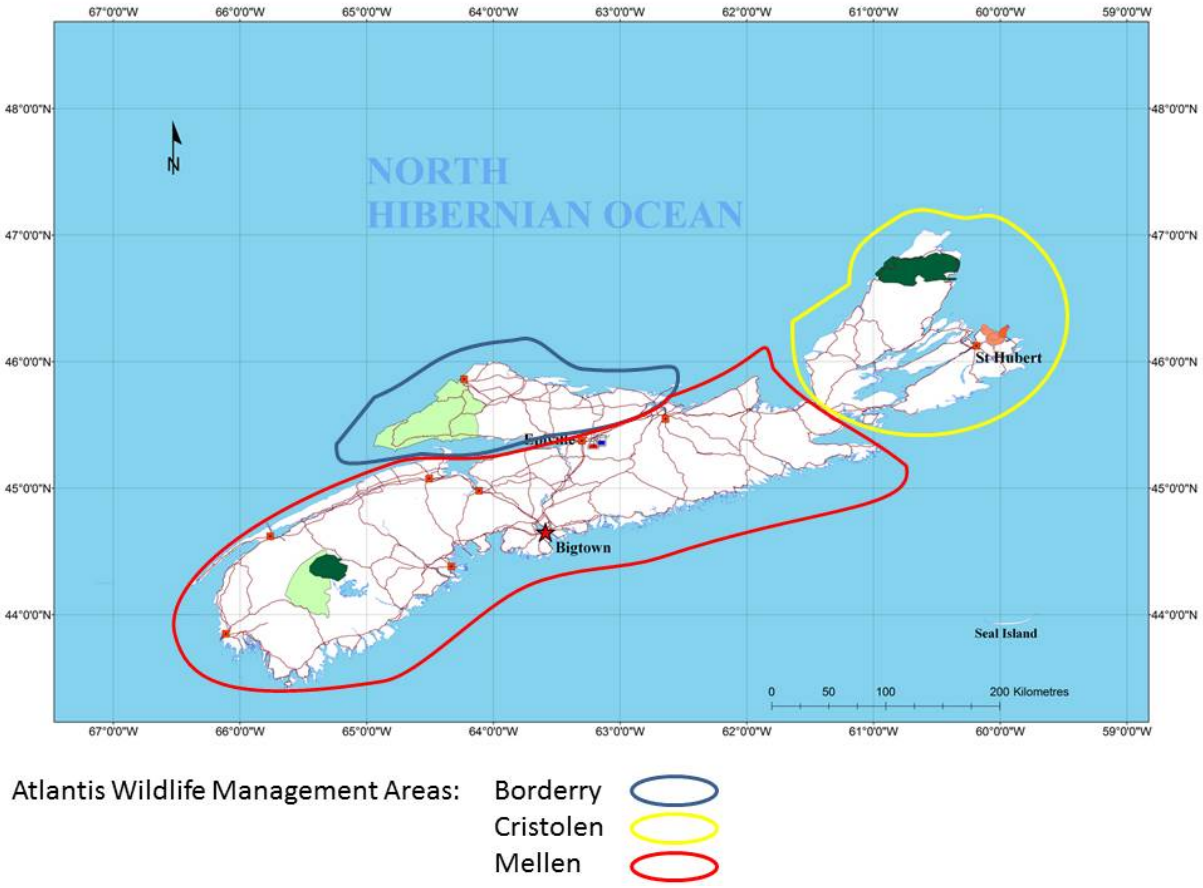


Chart 4: Proportion of cervids submitted for FMD testing by age category, 2013-2016

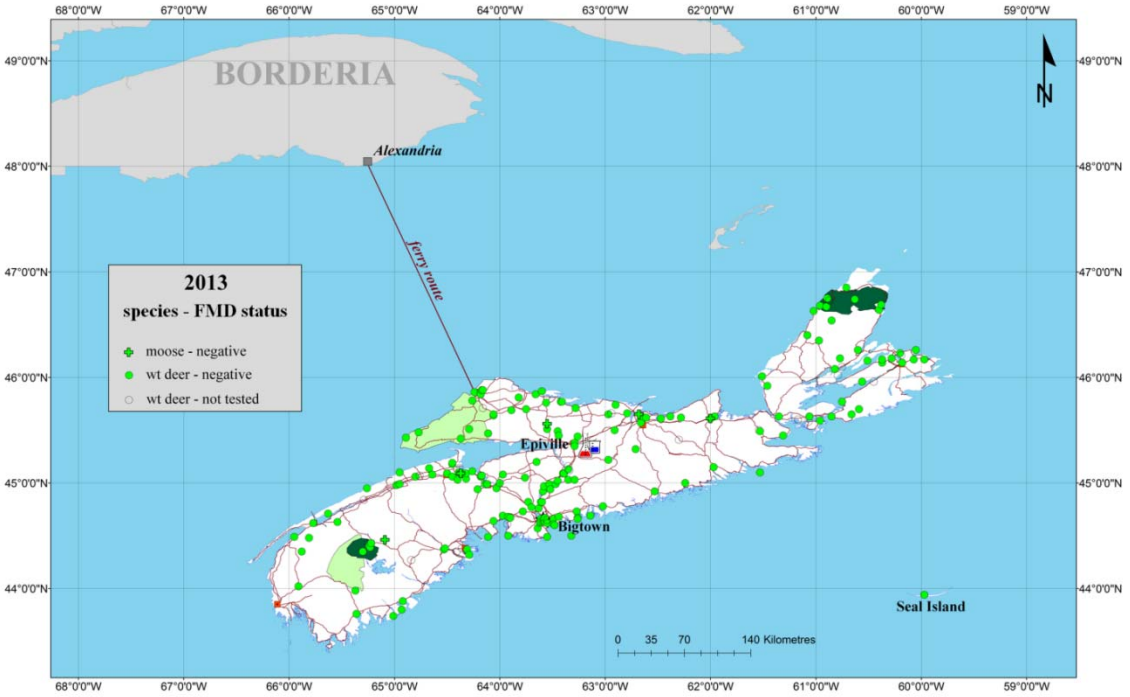


Scenario TS2 Maps:

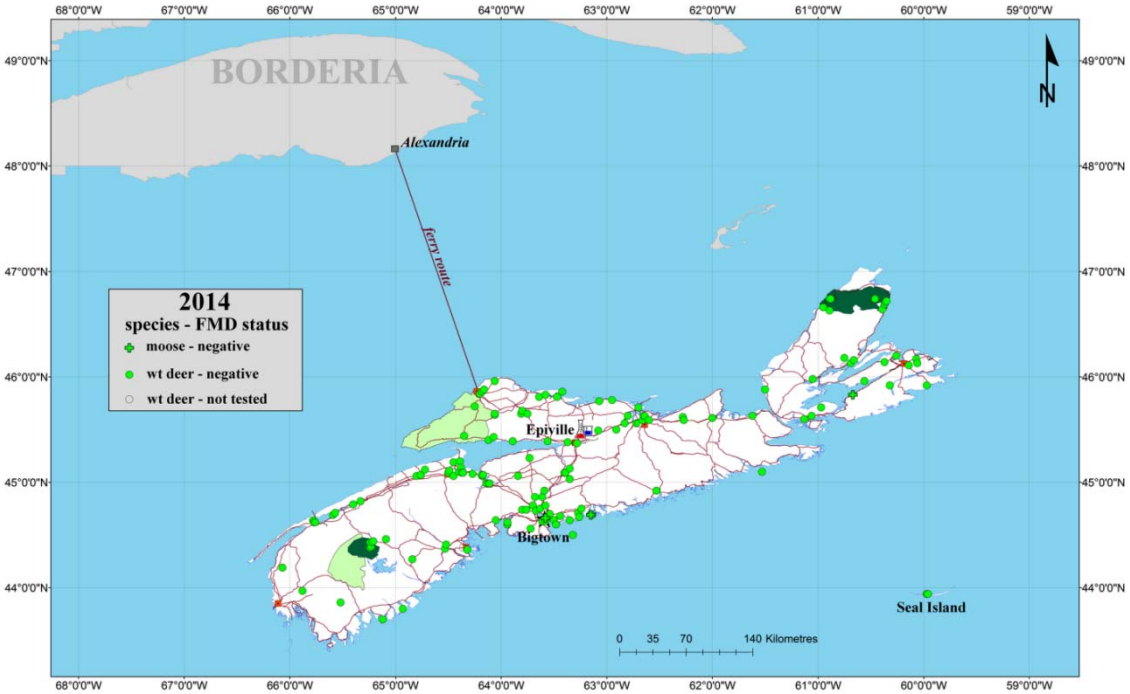
Map 1: The Wildlife Management Areas of Atlantis (2013)



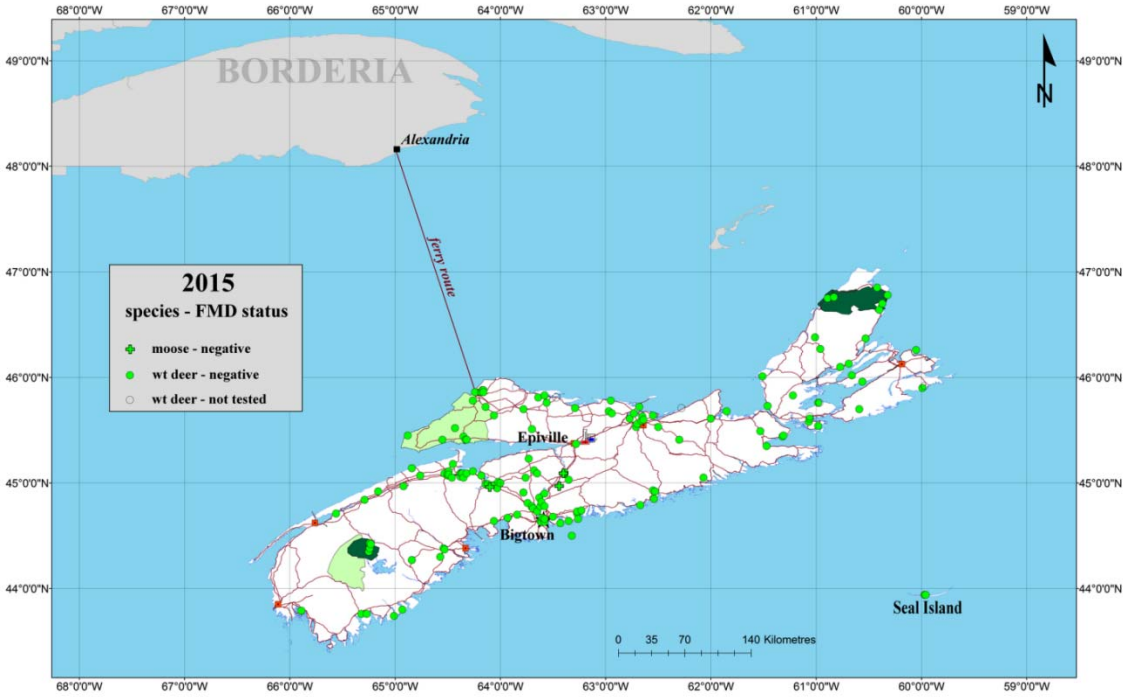
Map 2: Atlantis FMD surveillance results, 2013



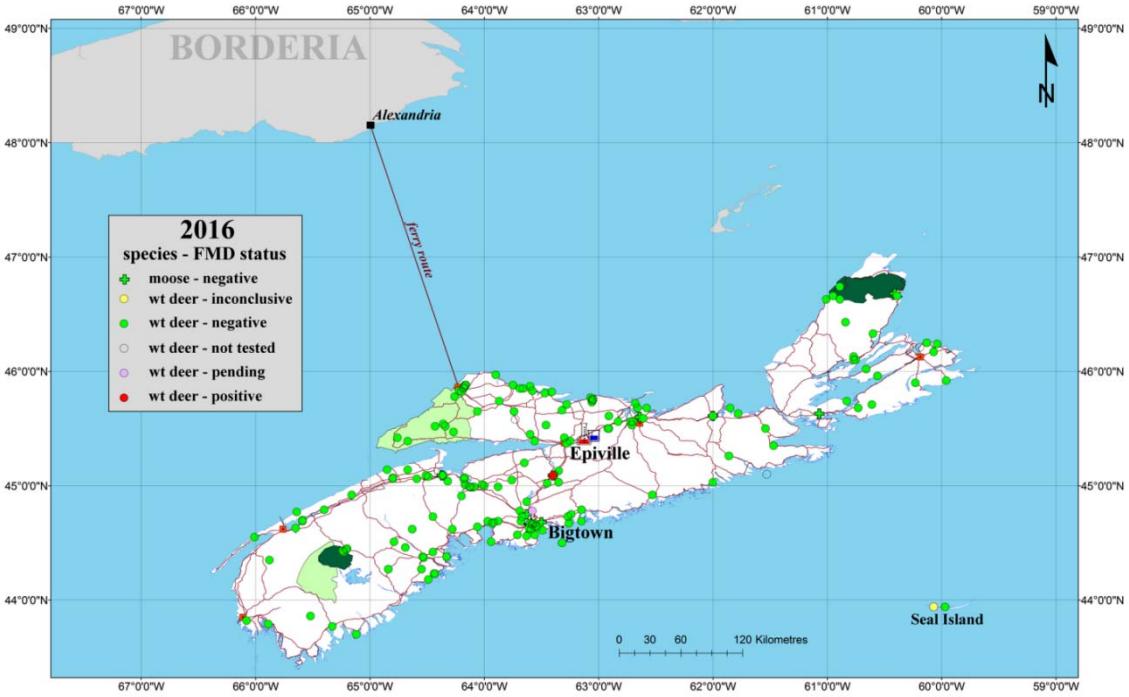
Map 3: Atlantis FMD surveillance results, 2014



Map 4: Atlantis FMD surveillance results, 2015



Map 5: Atlantis FMD surveillance results, 2016



Appendix E

Responses to General and Targeted wildlife surveillance activity questions

In this Appendix, you will find some responses to the questions posed in the exercises in the workbook. These responses are not intended to be comprehensive or the only acceptable responses. Rather, they are intended to permit readers who work through the exercises to assess their own evaluations against a set of responses that are broadly correct and reasonable.

ACTIVITY 1

1. Detection of Diseased or Dead Wild Animals: (Who can do this? How could it be organized?)

Government Agency Personnel:	Non-Government Groups
• *Natural Resources* • *Environment* • *Ocean Resources* • *Agriculture (would include veterinary service and various regional offices that might receive specimens, freeze them, ship them, etc.)* • *Aboriginal Government* • *Anguille Original People's Council*	• *Natural History Club* • *Fish and Game Association* • *Calliope International* • *National Fisherman's Union* • *National Farmer's Association* • *Universities – research scientists (biologists, ecologists, etc.)*

2. Identification of Pathogens and Diseases (Who can do this? How could it be organized?)

- *Ministry of Agriculture: National veterinary diagnostic laboratory*
- *Ministry of Health: National medical laboratory*
- *Ministry of Ocean Resources (often have specialized labs in food safety to detect marine toxins such as from harmful algal blooms*
- *University – Atlantis Veterinary College, likely to have a diagnostic laboratory and also research labs with special diagnostic capacities.*

3. Information Management (Who can do this? How could it be organized?)

- *Ministry of Agriculture, Veterinary Services*
  - *may already have a suitable data management system*
- *Ministry of Health*
  - *may already have a suitable data management system*
- *Central government Information Technology service*
  - *may already have a suitable data management system*
- *Universities*
  - *Veterinary college – may have capacity or expertise in diagnostic laboratory, faculty members in epidemiology.*
  - *Computer science departments*

4. Analysis and Communication (Who can do this? How could it be organized?)

- *The OIE Focal Point for Wildlife*
  - *Should play an important role here, either doing the analysis and communication directly or ensuring that it is done.*
- *Ministries of Agriculture (veterinary services), Health, Natural Resources, Environment and Ocean Resources all could participate and contribute expertise.*
- *Veterinary College faculty and staff also could participate*

ACTIVITY 2

*****For each question, the responses for Scenario 1 (Dataset G1) are provided first, followed by responses for Scenario 2 (Dataset G2).*****

What kinds of Errors can you find in the data?
Make a list of the kinds of errors or omissions you have found. Why do you think these different kinds of errors have occurred in the survey data?

Some examples of errors in the datasets for General wildlife disease surveillance are provided below:

Dataset G1 has 317 records - rows

- *Data missing:*
  - *Primary Diagnosis: 6 missing - 1.8%*
  - *Date Found – 48 missing – 15%*
  - *Latin name – 8 missing = 2.5%*
  - *Incorrect Locations – racoons in the ocean*
- *Incorrect Location information:*
  - *Negative Latitude – e.g. A2015-207.1 – longitude and latitude reversed*
  - *Positive Longitude – e.g. 11 records have positive longitude – data entry error*
- *Duplicate entries – same case number for each of three specimens shows the number dead to be 3, when each should have been entered as a single dead animal and three animals entered.*
  - *Bird A2015-100.1 is entered 4 times but is only 1 bird*
  - *A2015-30029.1 is entered 6 times (Primary Diagnosis is easy to spot – proventricular foreign body, sort by primary diagnosis)*
  - *Birds A2015-115.1 to 115.4 – each indicate 4 birds found dead but certainly are 4 individual specimens found together, but now are entered as 16 specimens*
  - *A2015-144.1 is used for two different specimens of different species*
  - *A2015-16.1 – used for 3 specimens, 2 different species.*
- *In addition, there are other similar mistakes here and there.*

Data Set G2 has 312 records – rows

- *Data missing:*
  - *Primary Diagnosis: none*
  - *Date Found – 50 missing – 16%*
  - *Latin name – 9 missing = 2.8%*
  - *Location (Lat/Long missing: 17 entries 5.5%*
  - *Incorrect Locations – racoon in the ocean*
- *Incorrect Location information:*
  - *Negative Latitude – 5 entries*
  - *Positive Longitudes – e.g. 34 records have positive longitude – data entry error*
- *Duplicate entries and similar mistakes:*
  - *Bird A2015-100.1 is used for 2 different specimens; so is A2105-144.1, and many others.*
  - *A2015-30029.1 is entered 6 times (Primary Diagnosis is easy to spot – proventricular foreign body, sort by primary diagnosis)*
  - *Birds A2015-115.1 to 115.4 – each indicate 4 birds found dead but certainly are 4 individual specimens found together, but now are entered as 16 specimens*
- *In addition, there are other similar mistakes here and there.*

Do you see any patterns in the Data?
Make a list of the kinds of patterns you have found
Can you explain why some of these patterns may have occurred?

Dataset G1 - Patterns Present:

- *Spatial clusters:*
  - *Around Bigtown - (where most people live)*
  - *Around Epiville - (location of veterinary diagnostic laboratory)*

- *Very non-uniform distribution of dead animals included in surveillance program – why might this be the case? (reflects human population to large extent)*

- *Clusters in Time*
  - *Some peaks of winter mortality: Reovirus, White Nose Syndrome*
  - *Otherwise, quite uniform throughout year*
  - *Same for Trichinellosis (hunting season), West Nile (mosquito season)*

Dataset G2 - Patterns Present:

- *Spatial clusters:*
  - *Minor cluster around Bigtown - (where most people live)*
  - *Notable cluster around Epiville - (location of veterinary diagnostic laboratory)*
  - *Two spatial clusters are associated with actual disease occurrences: Newcastle disease (east) and Morbillivirus (west of Bigtown)*
  - *Strong tendency to follow roads – (human activity)*
  - *More uniform distribution of dead animals included in surveillance program than in the other dataset (G1)*
  - *May reflect good use of regional government offices – wildlife officers distributed at multiple locations and good publicity so that there is general participation in disease detection by a network of people.*
- *Clusters in Time*
  - *Some peaks of winter mortality: Salmonella in song birds in spring*
  - *Outbreaks of Newcastle Disease and Morbillivirus are clustered in time. Note that Morbillivirus outbreak appears to be increasing at the end of the year, when the surveillance data end.*
  - *Same for Trichinellosis (hunting season), West Nile (mosquito season)*

Do you see any diseases or pathogens that strike you as particularly important for the *Dominion of Atlantis*?
List the pathogens and diseases you think may be important to Atlantis and note your reasons for thinking so.

Dataset G1 - Pathogens:

- *Some pathogens of potential Interest to participants/Atlantis may include:*
  - *Aleutian Disease – mink industry important in country*
  - *HP Avian Influenza – Poultry exports important to country*
  - *Baylisascaris – zoonosis*
  - *Lead and Mercury toxicity – possible sentinel for environmental contamination, food safety*
  - *Morbillivirus in seals, porpoises – conservation and tourism concern*
  - *Plague – zoonosis, tourism*
  - *Reovirus – virus new to science killing large numbers of wild birds, one outbreak is near St Hubert*
  - *Salmonella – seems very common in Redpolls*
  - *West Nile virus – zoonosis*
  - *White Nose Syndrome – conservation and control of agricultural insect pests.*
- *Mortality events in spatial clusters*
  - *The most obvious is Highly Pathogenic Avian Influenza*
  - ***Map G1B** shows the location of HPAI occurrences at the heart of the poultry industry near St. Hubert. Discussion could turn to the source of this HP AI virus, which almost certainly has come to wild birds FROM the poultry industry. There would surely have been en epidemic in the Atlantis poultry industry, probably well known to the Atlantis wildlife focal point, but that does not show up in the wildlife surveillance data.*
  - *This map also shows occurrence of a Low Pathogenicity AI virus (H7N3) at a different location.*
- *Mortality events clustered in time/season*
  - *Salmonella – nearly all cases occur in song birds in March*
  - *HP Avian Influenza – all cases found from 1 November to 15 December*
  - *Various others – less evident*
  - *Reovirus – 20 January to 6 February*

Dataset G2 - Pathogens:

- *Some pathogens of potential Interest to participants/Atlantis may include:*
  - *Aleutian Disease – mink industry important in country*
  - *H7 low pathogenicity Avian Influenza – must be reported, poultry exports important to country*

- *Baylisascaris – zoonosis*
- *Lead and Mercury toxicity – possible sentinel for environmental contamination, food safety*
- *New-to-science Morbillivirus in White-tailed deer (wild ungulate) – potential emerging disease that might be like rinderpest or PPR*
- *Plague – zoonosis, tourism*
- *Major loss of marine wildlife to a harmful algal bloom – possible negative impact on tourism, commercial seafood harvest, human health*
- *Salmonella – seems very common in Redpolls*
- *West Nile virus – zoonosis*
- *White Nose Syndrome – conservation and control of agricultural insect pests.*

- *Mortality events in spatial clusters:*
  - *Newcastle Disease in wild birds, not very far from St Hubert and concentration of poultry industry*
  - *New-to-science Morbillivirus in White-tailed deer (wild ungulate) – potential emerging disease that might be like rinderpest or PPR. This seems to have been detected first in dead dolphins on shore, and then to occur as a developing major epidemic in white-tailed deer (locally abundant wild ungulate)*
  - *Petroleum oil – a problem on sea coasts – suggests marine source of oil (shipping)*
- *Mortality events clustered in time/season (as noted above):*
  - *Newcastle Disease in wild birds, not very far from St Hubert and concentration of poultry industry*
  - *New-to-science Morbillivirus in White-tailed deer (wild ungulate) – potential emerging disease that might be like rinderpest or PPR. This seems to have been detected first in dead dolphins on shore, and then to occur as a developing major epidemic in white-tailed deer (locally abundant wild ungulate)*
  - *Same for Trichinellosis (hunting season), West Nile (mosquito season)*

Do you see any pathogens or disease occurrences that should be reported to the OIE?
List the pathogens and disease occurrences you find that would fall under each of these categories.

Dataset G1:

- *OIE List Pathogens:*
  - *Avian Influenza HP H5N1*
  - *Avian Influenza Low Path H7N3*
  - *Rabies*
  - *Trichinellosis*
  - *West Nile virus*
  - ***NOTE –** Trichomonosis in birds is NOT a listed disease. For the OIE, "Trichomonosis" refers to bovine genital infection only*
  - ***Potential Emerging Diseases**:*
    - *Reovirus*
- *OIE Non-list Wildlife Pathogens:*
  - *Avian Pox*
  - *Baylisascaris*
  - *Infection with Batrachochytrium dendrobatidis*
  - *Canine Distemper*
  - *Lead Poisoning (chemical)*
  - *Mercury Poisoning (chemical)*
  - *Morbillivirus in aquatic mammals*
  - *Organophosphate poisoning (chemical)*
  - *Pasteurellosis (P. multocida)*
  - *Petroleum Oil toxicity (chemical)*
  - *Plague (Y. pestis)*
  - *Sarcoptic Mange*
  - *Trichomonas sp.*
  - *White Nose Syndrome of bats*

Dataset G2:

- *OIE List Pathogens:*
  - *Newcastle Disease*
  - *Avian Influenza Low Path H7N3*

- *Rabies*
- *Trichinellosis*
- ***NOTE –** Trichomonosis in birds is NOT a listed disease. For the OIE, "Trichomonosis" refers to bovine genital infection only*
- ***Potential Emerging Diseases:***
  - *Morbillivirus epidemic in White-tailed deer*

- *OIE Non-list Wildlife Pathogens:*
  - *Avian Pox*
  - *Baylisascaris*
  - *Infection with Batrachochytrium dendrobatidis*
  - *Canine Distemper*
  - *Lead Poisoning (chemical)*
  - *Mercury Poisoning (chemical)*
  - *Morbillivirus in aquatic mammals*
  - *Organophosphate poisoning (chemical)*
  - *Pasteurellosis (P. multocida)*
  - *Petroleum Oil toxicity (chemical)*
  - *Plague (Y. pestis)*
  - *Sarcoptic Mange*
  - *Trichomonas sp.*
  - *White Nose Syndrome of bats*

Based on your review of the data, what IMPROVEMENTS do you think are needed in the surveillance program of the Dominion of Atlantis?
What improvements would you suggest?
How could Atlantis achieve the improvements you think are needed?

Some of the improvements that may be suggested include:

1. *Reducing the amount of missing data*
   - *How could Atlantis achieve this goal?*
     - *Training/education of personnel regarding data recording so everyone understands what data should be recorded in each data field.*
     - *Training on use of GPS or other was to determine latitude and longitude, and correct way to record these (positive and negative numbers, etc)*
     - *Forms to fill out for each specimen collected in the field, to make data collection uniform*
     - *Immediate follow-up with people who detected each incident with missing data to try to find those missing data – someone would have to be assigned to do this, and would have to review data for new entries very soon after the data were received.*

2. *Acquiring samples from places distant from Bigtown to achieve vigilance for disease occurrences and samples more uniformly across the country (Data set G1)*
   - *How could Atlantis achieve this goal?*
     - *Wider publicity about the surveillance program*
     - *Expansion of the network of people engaged in detection of sick or dead animals to include the whole country.*
     - *Better use of regional offices of the Ministries of Natural Resources, Agriculture, Ocean Resources, etc.*
     - *Engage participation of NGO, naturalist groups with active members in different regions.*

ACTIVITY 3

A. Low disease or pathogen prevalence – 2%

		True disease/pathogen status		Total	Predictive values
		+	-		
Diagnostic test result	+	*20*	*98*	*118*	*PPV=20/118=17%*
	-	*0*	*882*	*882*	*NPV=882/882=100%*
Total		*20*	*980*	1000	

True prevalence=2% **Apparent prevalence=12%**
Sensitivity=99%; Specificity=90%

B. High disease or pathogen prevalence – 40%

		True disease/pathogen status		Total	Predictive values
		+	-		
Diagnostic test result	+	*396*	*60*	*456*	*PPV=396/456=87%*
	-	*4*	*540*	*544*	*NPV=540/544=99.3%*
Total		*400*	*600*	1000	

True prevalence=40% **Apparent prevalence=46%**
Sensitivity=99%; Specificity=90%

C. Describe the effect of true prevalence on the interpretation of the test results.
What happened to the predictive values of the test when true prevalence was changed?
What happened to the apparent prevalence?

When the true prevalence increased (from 2% to 40%) the PPV increased from 17% to 87% and the NPV decreased very slightly (from 100% to 99.3%).

The apparent prevalence increased from 12% to 46% when the true prevalence increased from 2% to 40%.

*The take home message from this example – **the closer the true prevalence of disease is to 50%, the better diagnostic tests perform** (higher predictive values overall and better agreement between the true and apparent prevalence).*

ACTIVITY 4

A. Low Sensitivity

		True disease/pathogen status		Total	Predictive values
		+	-		
Diagnostic test result	+	*80*	*90*	*170*	*PPV=80/170=47%*
	-	*20*	*810*	*830*	*NPV=810/830=97.6%*
Total		*100*	*900*	1000	

True prevalence=10% ***Apparent prevalence=17%***
Sensitivity=80%; Specificity=90%

B. High Specificity

		True disease/pathogen status		Total	Predictive values
		+	-		
Diagnostic test result	+	*80*	*9*	*89*	*PPV=80/89=90%*
	-	*20*	*891*	*911*	*NPV=891/911=97.8%*
Total		*100*	*900*	1000	

True prevalence=10% ***Apparent prevalence=9%***
Sensitivity=80%; Specificity=99%

The effect of reducing the sensitivity is more marked at higher disease/pathogen prevalence; try redoing the calculations with prevalence at 40% and see what happens.

C. What happened to the predictive values of the test when the specificity increased?

When the specificity of the test was increased from 90% to 99%, the PPV increased from 47% to 90% and there was very little change in the NPV. If the sensitivity was increased instead, the NPV (already high) would be even higher.

*The higher the sensitivity the more likely it is that the animal really is **NOT** infected if it tests negative (high sensitivity rules out infection – high NPV);*

*The higher the specificity, the more likely it is that the animal really **IS** infected if it tests positive (high specificity rules in infection – high PPV).*

D. There are times when tests with higher sensitivity are preferred and other times when higher specificity is needed. Propose some examples of surveillance objectives when tests with higher sensitivity, or with higher specificity, would be advantageous.

High sensitivity: When you don't want to miss any infected animals; tests with high sensitivity provide very few false negative results.
Examples:
- *detecting important notifiable diseases*
- *demonstrating freedom or detect infection*

High specificity: these tests provide very few false positive results
Examples:
- *determining disease prevalence*
- *identifying disease trends.*

ACTIVITY 5

For each question, the responses for Scenario TS1 (Rabies) are provided first followed by responses for Scenario TS2 (FMD).

1. What errors or inconsistencies did you find in the datasets?

Scenario 1 (Rabies)

- *Inconsistent entry for test result – Negative and Positive entered for samples received late in 2016; Neg and Pos entered for samples received earlier*
- *Incorrect and missing dates*
- *Missing information about how the animals were found and their age category*

Scenario 2 (FMD)

- *Inconsistent entry for sex – M and F in 2013; Male and Female in other years*
- *Incorrect and missing dates - especially years (e.g. there are entries for 2011, 2012, and 2051)*
- *Incorrect locations – refer to points in the sea on the map*
- *Missing information about how the animals were found*
- *Missing test results*

2. What patterns are present in the data? (Spatial, temporal, other...)

Scenario 1 (Rabies)

- *Spatial (refer to maps): only animals in south-west Atlantis were included in surveillance (within 150km of Kejimkujak)*
- *Temporal (refer to charts): both species caught throughout the year; more coyotes tested than raccoons earlier in the surveillance program (2015), some spikes in animal submissions.*

Scenario 2 (FMD)

- *Spatial (refer to maps and charts): most animals were from Mellen WMA; very few from the other WMAs in Atlantis*
- *Temporal (refer to charts): most animals caught and tested in the fall of each year (Oct-Dec). Consider how this could affect the surveillance program timeliness.*

3. Do you have all the data that you need to interpret the information provided and meet the stated objectives of the targeted surveillance program? If not, make a list of the additional information that is needed.

Scenario 1 (Rabies)

- *There are no good data for either coyote or raccoon populations in Atlantis. Both are considered to have large and increasing populations, likely over 100000 each*
- *Test sensitivity and specificity are provided in the background document.*
- *Currently no rabies control or vaccination program in Atlantis.*

Scenario 2 (FMD)

- *Population of deer and moose in Atlantis and in 3 of WMAs are provided in the background sheet*
- *Test sensitivity and specificity (for ELISA in cattle) are also provided.*
- *FMD vaccination is not practiced in Atlantis.*

4. Are there any important biases that would affect how you interpret the targeted surveillance data results? Describe how the data might be biased and if this is a problem or not.

Scenario 1 (Rabies)

- *A large proportion of the animals included in the rabies surveillance program were found dead. These animals may or may not be representative of the general raccoon or coyote population. Consider how this could impact the accuracy of the prevalence estimates (if these animals are more likely to be*

infected then we may overestimate the prevalence of rabies in the population). Consider if age or sex could affect the detection of rabies (unlikely).

- *It is also important to note that there were a few test positive animals collected quite close to the surveillance area boundary. It may be necessary to extend the surveillance area to ensure that no positive animals were missed and that the new rabies strain has not already spread further into Atlantis.*

Scenario 2 (FMD)

- *Because most of the samples come from hunted animals, a greater proportion of the animals tested are male and most are adults. How could sex and age affect the surveillance results? FMD virus should not preferentially infect and age or sex group so this is unlikely to bias the results.*
- *However, the hunted animals are more likely to be disease-free than the general population because hunters tend to select the larger and "healthier" animals. This selection bias reduces the likelihood that the animal is infected with FMD virus and thus can affect the predictive value of the diagnostic tests used. In this situation, the true prevalence is believed to be very low (close to 0) so this is unlikely to bias the surveillance results to date.*

5. What are the important surveillance findings? How should these findings be reported to the OIE? Who else should be informed about the surveillance findings?

Scenario 1 (Rabies)

- *A new coyote-adapted strain of rabies has been identified in 11 coyotes and 2 raccoons in 2015-2016. In 2015: 7/49 (8.9%) coyotes tested positive; in 2016: 4/115 (3.5%) coyotes and 2/141 (1.4%) of raccoons tested positive.*
- *Rabies is an OIE-listed disease and this is a new strain. According to the terrestrial animal health code, "the first occurrence of a new strain of a pathogen of a listed disease in a country" must be provided to OIE within 24 hours (see article 1.1.3 and the rabies specific chapter for further discussion).*
- *Rabies is an important zoonotic pathogen and as such ministries responsible for public health and agriculture need to be made aware that a new variant of rabies is circulating in Atlantis.*

Scenario 2 (FMD)

- *1 deer tested positive for FMD virus in 2016 and another had an inclusive test result.*
- *Atlantis is an FMD-free country where vaccination is not practiced. In the years prior to 2016, FMD was not detected and the information from the targeted surveillance program describing which susceptible animals were tested, how many and what the test results were needs to be provided to the OIE annually, along with other information in the FMD chapter of the Terrestrial Animal Health Code.*
- *In 2016, 1 animal tested positive and a second one had an inconclusive test result. Prior to formal notification, these test results should be confirmed with additional testing. Should it be determined that the positive test result is truly positive, the OIE must be notified within 24 hours as FMD is a listed disease and this would be the first occurrence in Atlantis.*
- *Although the case of FMD in 2016 was observed in a wild animal, FMD is an important infectious disease of livestock; the Ministry of Agriculture must be informed.*

ACTIVITY 6

For each question, the responses for Scenario 1 (Rabies) are provided first followed by responses for Scenario 2 (FMD)

Are the data gathered through the program adequate to meet the stated objectives?

Scenario 1 (Rabies)

- *Refer to objectives in background document.*
- *Using Ausvet, how many animals needed to be included in the surveillance program to estimate the prevalence of rabies in the population? Refer to the background documents for the estimated prevalence in raccoons and coyotes and the test characteristics. Calculate the sample size and compare this to the number of samples tested:*
    - *Coyote: estimated prevalence is 10%; desired precision is 5% - sample size needed is 169 animals. Raccoons: estimated prevalence is 2%; desired precision is 5% - sample size needed is 58 animals*
    - *** Consider whether these numbers should be sample each year or over the full 2 years presented here.*

- *Based on these results, the data are adequate to meet the stated objectives over the 2 year study period. Additional animals are needed to achieve the desired level of precision for the prevalence in coyotes if the estimates are done by year.*
- *The data do not enable Atlantis to know the distribution over the entire country; only for the area from which animals were collected.*

Scenario 2 (FMD)

- *The purpose of the surveillance program was to detect Foot-and-Mouth disease virus if it occurred in wildlife in Atlantis. Refer to objectives in background document. Based on the dataset, Table 1 (below) can be created.*

Table 1: FMD testing of wild cervids from Atlantis by year

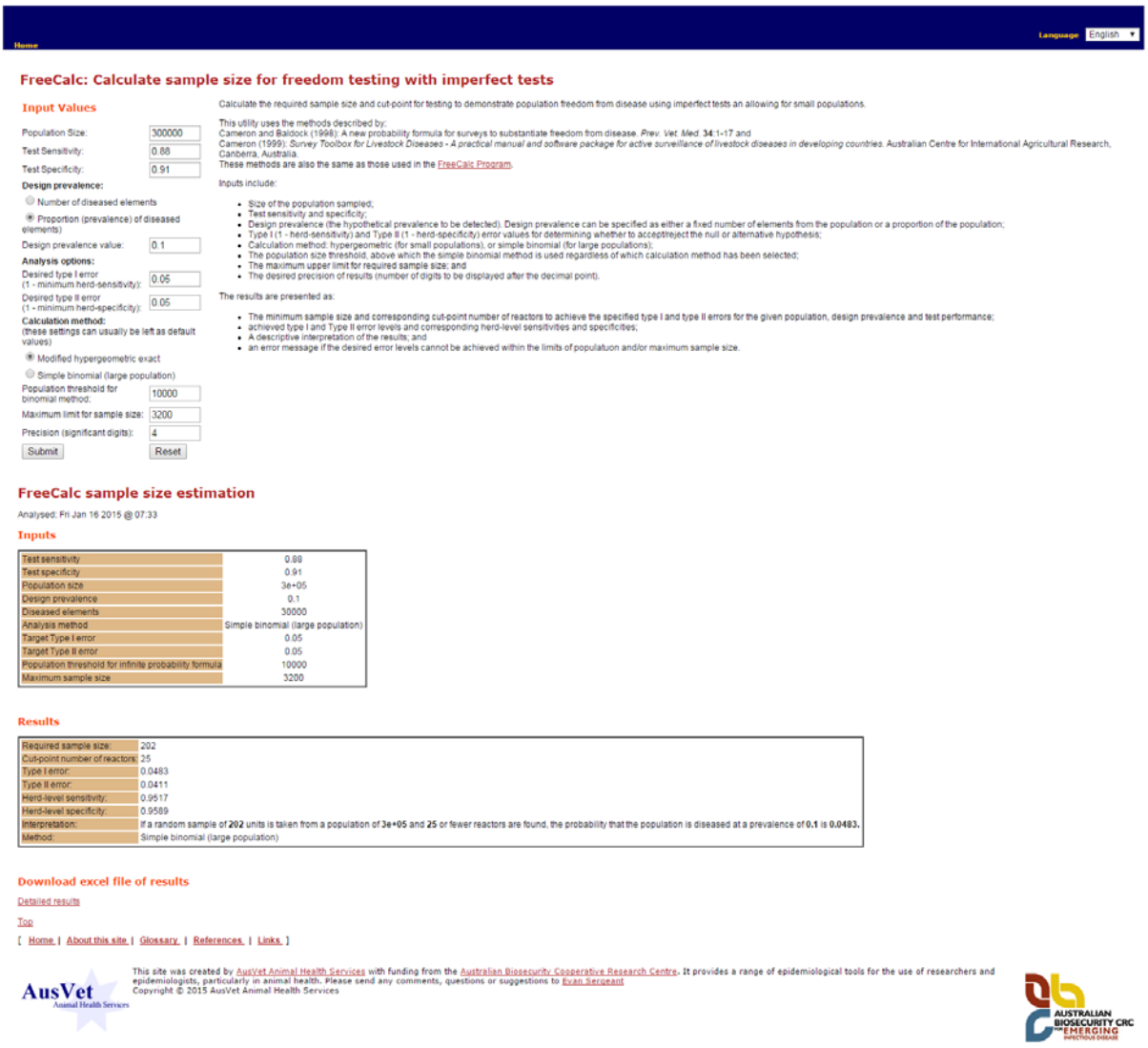
Year	Epiville Lab	
	# Samples submitted	# Samples tested[1]
2013	323	274
2014	231	221
2015	222	212
2016	252	244
Total	1028	951

[1] *Where the number of samples tested is less than the number submitted, the tissue samples received by the lab were not adequate for testing purposes.*

- *Using Ausvet, you can enter different prevalence estimates to see if the level of sampling in Atlantis was adequate to meet the surveillance program objectives.*

- *Below is one example from Ausvet assuming that the test has the same characteristics in deer as it does in cattle (test sensitivity of 88% and specificity of 91%). A prevalence to be detected of 10% was entered and the population entered was an estimate of the entire deer population (including moose) in Atlantis. From the results, the required sample size was 202 animals and up to 25 animals could test positive and you would still be >95% confident that Atlantis was free of FMD. The sample size in each of the 4 years is adequate to meet the stated objectives.*

    - *With the imperfect diagnostic test, up to 25 animals could test positive and you would still be 95% confident that, if present, the prevalence of FMD was less than 10%. However, the positive and inconclusive test results should still be further evaluated to help confirm that these are truly false positive results.*



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Language English

FreeCalc: Calculate sample size for freedom testing with imperfect tests

Input Values

Population Size: 300000
Test Sensitivity: 0.88
Test Specificity: 0.91
Design prevalence:
Number of diseased elements
Proportion (prevalence) of diseased elements)
Design prevalence value: 0.1
Analysis options:
Desired type I error (1 - minimum herd-sensitivity): 0.05
Desired type II error (1 - minimum herd-specificity): 0.05
Calculation method: (these settings can usually be left as default values)
Modified hypergeometric exact
Simple binomial (large population)
Population threshold for binomial method: 10000
Maximum limit for sample size: 3200
Precision (significant digits): 4
Submit Reset

Calculate the required sample size and cut-point for testing to demonstrate population freedom from disease using imperfect tests an allowing for small populations.

This utility uses the methods described by:
Cameron and Baldock (1998): A new probability formula for surveys to substantiate freedom from disease. *Prev. Vet. Med.* 34:1-17 and
Cameron (1999): *Survey Toolbox for Livestock Diseases - A practical manual and software package for active surveillance of livestock diseases in developing countries*. Australian Centre for International Agricultural Research, Canberra, Australia.
These methods are also the same as those used in the FreeCalc Program.

Inputs include:

- Size of the population sampled;
- Test sensitivity and specificity;
- Design prevalence (the hypothetical prevalence to be detected). Design prevalence can be specified as either a fixed number of elements from the population or a proportion of the population;
- Type I (1 - herd-sensitivity) and Type II (1 - herd-specificity) error values for determining whether to accept/reject the null or alternative hypothesis;
- Calculation method: hypergeometric (for small populations), or simple binomial (for large populations);
- The population size threshold, above which the simple binomial method is used regardless of which calculation method has been selected;
- The maximum upper limit for required sample size; and
- The desired precision of results (number of digits to be displayed after the decimal point).

The results are presented as:

- The minimum sample size and corresponding cut-point number of reactors to achieve the specified type I and type II errors for the given population, design prevalence and test performance;
- achieved type I and Type II error levels and corresponding herd-level sensitivities and specificities;
- A descriptive interpretation of the results; and
- an error message if the desired error levels cannot be achieved within the limits of population and/or maximum sample size.

FreeCalc sample size estimation

Analysed: Fri Jan 16 2015 @ 07:33

Inputs

Test sensitivity	0.88
Test specificity	0.91
Population size	3e+05
Design prevalence	0.1
Diseased elements	30000
Analysis method	Simple binomial (large population)
Target Type I error	0.05
Target Type II error	0.05
Population threshold for infinite probability formula	10000
Maximum sample size	3200

Results

Required sample size:	202
Cut-point number of reactors:	25
Type I error:	0.0483
Type II error:	0.0411
Herd-level sensitivity:	0.9517
Herd-level specificity:	0.9589
Interpretation:	If a random sample of **202** units is taken from a population of **3e+05** and **25** or fewer reactors are found, the probability that the population is diseased at a prevalence of **0.1** is **0.0483.**
Method:	Simple binomial (large population)

Download excel file of results

Detailed results

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AusVet Animal Health Services

This site was created by AusVet Animal Health Services with funding from the Australian Biosecurity Cooperative Research Centre. It provides a range of epidemiological tools for the use of researchers and epidemiologists, particularly in animal health. Please send any comments, questions or suggestions to Evan Sergeant
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AUSTRALIAN BIOSECURITY CRC for EMERGING INFECTIOUS DISEASES

- *Perhaps you would prefer that the prevalence was lower than 10%. If you entered a prevalence of 5% instead, the required sample size would be 703 animals and up to 76 could test positive (screen shot not shown). In this case, the sample size for each year is not adequate but over the 4 years together, the sample target is achieved.*
- *However, it is very possible that the test works differently in deer than cattle. If you assumed a perfect test, just 59 animals would have to be tested (with no reactors) to be 95% confident that, if present in Atlantis, the prevalence of FMD was less than 5% (screen shot not shown). In this situation, the annual sample number is adequate to meet the stated objective. However, with 1 positive reactor in 2016, Atlantis can no longer be confident that it remains free from FMD. It would be helpful if the test was validated for use in wild deer or if a different type of test with less potential variation between species was available.*
- *Regardless, both the positive reactor and the animal with the inconclusive test result should be further investigated and additional testing is recommended. If a validated test is available it should be applied; if not, another test that may exhibit less variation in performance across species should be used.*

How would you improve the program?

Scenario 1 (Rabies)

- *Carry out surveillance across all of Atlantis*
- *Include additional susceptible wild animal species*
- *Link wildlife rabies surveillance data to surveillance done in domestic animals*

- *Establish a threshold for implementation of the control program ahead of time*

Scenario 2 (FMD)

- *In Atlantis, most of the moose and deer tested have come from the Mellen WMA (63%). If wild moose and deer infected with FMD are able to move freely, they are most likely to arrive in Atlantis from Borduria and therefore arrive first on the west coast of Atlantis (in Borderry). If the west coast is considered highest risk for introduction from Borduria, it might be most appropriate to focus surveillance activities there.*
- *Since 2013, the level of wild deer and moose testing in Atlantis has been adequate to detect FMD virus at a prevalence of 5% (with 95% confidence – assuming that the test sensitivity and specificity estimates are appropriate for wild deer) . But the 1 positive (and 1 inconclusive) test result in 2016 are cause for concern and require further testing, investigation and follow-up. A validated test for use in wild deer would greatly improve the program.*
- *Because wild boar are highly susceptible to FMD, it would be worth developing a plan to incorporate wild boar into the surveillance program.*

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Preventive Veterinary Medicine 34 (1998) 1–17

PREVENTIVE VETERINARY MEDICINE

A new probability formula for surveys to substantiate freedom from disease

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Accepted 12 September 1997

Abstract

Surveys to substantiate freedom from disease are becoming increasingly important. This is due to the changes in rules governing international trade in animals and animal products, and to an increase in disease eradication and herd-level accreditation schemes. To provide the necessary assurances, these surveys must have a sound theoretical basis. Until now, most surveys have been based on the assumption that the screening test used was perfect (sensitivity and specificity both equal to one), and/or that the study population was infinite. Clearly, these assumptions are virtually always invalid. This paper presents a new formula that calculates the exact probability of detecting diseased animals, and considers both imperfect tests and finite population size. This formula is computationally inconvenient, and an approximation that is simpler to calculate is also presented. The use of these formulae for sample-size calculation and analysis of survey results is discussed. A computer program, 'FreeCalc', implementing the formulae is presented along with examples of sample size calculation for two different scenarios. These formulae and computer program enable the accurate calculation of survey sample-size requirements, and the precise

Abbreviations: p, Prevalence; Se, Sensitivity; Sp, Specificity; D^+, Disease[1]-positive animals (true positives); D^-, Disease-negative animals (true negatives); T^+, Test-positive animals (positive reactors); T^-, Test-negative animals (negative reactors); $P()$, Probability of an event with the event of interest described in the brackets; x, Number of T^+ in a sample; y, Number of D^+ in a sample; n, Sample size; N, Population size; d, Number of diseased D^+ animals in the population; $\text{Bin}(n,p)$, Binomial distribution with parameters n and p; $\binom{n}{x}$, Number of ways that x objects can be drawn from n, equal to $(n!)/(x!(n-x)!)$

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[1] Disease in this context is defined in its broadest context: possessing the abnormality or state of interest. In surrogate tests for disease, it may mean, for example, the presence of antibodies.

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PII S0167-5877(97)00081-0

analysis of survey results. As a result, survey costs can be minimised, and survey results will reliably provide the required level of proof. © 1998 Elsevier Science B.V.

Keywords: Surveys; Freedom from disease; Aggregate testing; Detection of disease; Hypergeometric distribution

1. Introduction

Recent changes in regulations governing the international trade in animals and animal products have led to a greater need for epidemiologically sound surveys to substantiate the freedom of a country or zone from particular diseases. The World Trade Organisation (WTO) has the responsibility of implementing the various international agreements finalised through the Uruguay round of the General Agreement on Tariffs and Trade (GATT) (Anon., 1994). The WTO began operations in January 1995 and has adopted the codes of the Office International des Epizooties (OIE) to serve as guidelines for international trade in animals. A critical component of these guidelines is the establishment of regional, national, or sub-national disease-free zones for the purpose of livestock exports. Many countries are endeavouring to eradicate high-impact or trade-limiting diseases such as rinderpest, tuberculosis, foot and mouth disease (FMD), and contagious bovine pleuropneumonia. Substantiation of the final success of these campaigns will depend partly on statistically valid surveys. In addition, countries currently free from disease may also be required to provide stronger evidence for their disease-free status than simply the absence of clinical reports. Absolute proof requires the examination of every animal in the population, using an infallible test. As this is not feasible, sample surveys are used, and results are reported in terms of probability statements that the disease, if present, has a prevalence lower than a defined level that is usually determined by prior experience or analogy from other countries.

It is important to draw a distinction between surveys that aim to substantiate freedom from disease (or detect disease), and those that are designed to provide an estimate of disease prevalence. When surveying to substantiate freedom, the conclusion of the survey will be that disease is or is not present, and this statement will be qualified by the probability that it is correct. Surveys to estimate disease prevalence will produce an estimate of the prevalence, usually qualified by a confidence interval. The statistical theories behind the design and analysis of the two types of survey are different. Clearly, data gathered during the course of a survey to substantiate freedom from disease can be used to estimate the prevalence of disease, although differing survey design requirements may mean that the confidence intervals of the prevalence estimate are too wide for the intended use.

In the past, two assumptions have been commonly made to simplify the calculation of these probabilities, namely: (1) that the diagnostic test being used is perfect, and/or (2) that the population being studied is infinite (or that sampling is performed with replacement). Formulae based on these assumptions are presented below. However, virtually no diagnostic test is perfect, and populations under study are often small enough to be considered finite, especially when sampling animals within a herd. One other assumption of all common formulae is that sampling of the populations takes place

by simple random sampling. Violations of this assumption invalidate the results of the formulae. This important limitation is sometimes neglected—especially in the analysis of slaughterhouse surveys (McLaughlin, 1995), or surveys based on passively acquired serum banks (Thornton and Motha, 1995).

The sample size calculation that is commonly used estimates the number of animals that need to be tested (when sampling by simple random sampling from a homogenously mixing population), for the probability of selecting at least one diseased animal to be greater than a preset confidence level (commonly 95%). The calculation is based on the assumption that, if the disease is present, it will be present at a certain minimum prevalence.

The appeal of the approximate formula of Cannon and Roe (1982) for sample size is its simplicity. The results have been tabulated and published, and can be calculated for any population size using a pocket calculator. A simple modification of the approximate formula considering test sensitivity has been produced (MacDiarmid, 1988). The exact probability formula for finite populations and imperfect tests presented here is much more complex, and difficult to use. Calculation of the binomial approximation to this formula is somewhat faster, but still awkward. A major drawback is that the formula for probability cannot be equated to n, the sample size. To calculate the sample size that produces a given probability, a process of trial and error is required. This process has been implemented in a computer program ('FreeCalc'), which calculates the exact sample size, and can also be used as a probability calculator for the analysis of survey results.

This paper reviews the approaches in common use, and introduces two new formulae that can be used to plan and analyse surveys to substantiate freedom from disease. The use of a new computer program to simplify this task is described, and two examples of the practical application of the formulae for planning surveys are presented.

2. Probability formulae

2.1. Perfect test, infinite population

The probability of selecting a given number of reactors when selecting animals from a population with disease prevalence p is given by the binomial distribution:

$$P(T^+ = x) = \binom{n}{x} p^x (1-p)^{(n-x)}. \quad (1)$$

If a perfect test is used, a survey to substantiate freedom from disease requires that no diseased animals are found. When $x = 0$, this formula simplifies to:

$$P(T^+ = 0) = (1-p)^n. \quad (2)$$

2.2. Imperfect test, infinite population

When an imperfect test is used, the situation is more complex. The probability of getting a positive test result ($P(T^+)$) when testing a single animal depends on the true

disease status of that animal. If it is disease positive, $P(T^+)$ is equal to Se; if it is disease negative, $P(T^+)$ is equal to 1 − Sp. The overall probabilities $P(T^+)$ and $P(T^-)$ are given by:

$$P(T^+) = p\,\mathrm{Se} + (1-p)(1-\mathrm{Sp})$$
$$P(T^-) = p(1-\mathrm{Se}) + (1-p)\mathrm{Sp}. \quad (3)$$

The probability of observing x reactors when testing n animals from an infinite population is given by the binomial distribution (Eq. (1)) with the positive and negative probabilities substituted from Eq. (3):

$$P(T^+ = x) = \binom{n}{x}[\,p\mathrm{Se} + (1-p)(1-\mathrm{Sp})\,]^x[\,p(1-\mathrm{Se}) + (1-p)\mathrm{Sp}\,]^{n-x}. \quad (4)$$

2.3. Perfect test, finite population

In the case of finite population sizes, trials are not independent. When the first animal is drawn, the probability of drawing a D^+ is d/N, but with each D^+ drawn, d is decreased by one. N decreases with every animal drawn. When a perfect test is used, the probability that T^+ (and D^+) will equal x is given by the hypergeometric distribution:

$$P(T^+ = x) = \frac{\binom{d}{x}\binom{N-d}{n-x}}{\binom{N}{n}}. \quad (5)$$

When aiming to substantiate freedom from disease, x is equal to zero, and this formula simplifies to (Cannon and Roe, 1982):

$$P(T^+ = 0) = \frac{(N-d)!(N-n)!}{(N-d-n)!N!}. \quad (6)$$

Unfortunately, factorial formulae involving large numbers are awkward to calculate. Hand-held calculators can usually calculate factorials no higher than about 70!, and personal computers use logarithmic approximations to exceed factorials of about 170!. A convenient approximation to this formula, (e.g. Cannon and Roe, 1982) is:

$$P(T^+ = 0) = \left(1 - \frac{d}{N - \frac{n-1}{2}}\right)^n. \quad (7)$$

2.4. Imperfect test, finite population

To overcome the limitations of the above formulae, the hypergeometric distribution (Eq. (5) above) can be modified for imperfect tests. The number of D^+ in the sample

has a hypergeometric distribution. Given a number y of D^+ in the sample, the number of true positives is Bin(y,Se), and the number of false positives is Bin($n-y$, $1-\mathrm{Sp}$). We will have a number x of T^+ if we have j true positives and $x-j$ false positives. By considering the possible values of y and j, we can write:

$$P(T^+=x)=\sum_{y=0}^{d}\frac{\binom{d}{y}\binom{N-d}{n-y}}{\binom{N}{n}}\sum_{j=0}^{\min(x,y)}\binom{y}{j}\mathrm{Se}^{j}(1-\mathrm{Se})^{y-j}\binom{n-y}{x-j}$$

$$\times(1-\mathrm{Sp})^{x-j}\mathrm{Sp}^{n-x-y+j}. \tag{8}$$

2.5. Approximation to the hypergeometric

2.5.1. Description of the approximation

Although able to provide the exact probability, Eq. (8) above is too complex to be practically used except for relatively small sample sizes. In addition to the problems of calculating large factorial terms, it is a summation that approaches 2^n terms. Even when implemented on a computer, calculation can be very slow. To overcome this difficulty, an approximation (described in Appendix A) was developed based on the binomial distribution. The approximation uses an estimate of the average probability of selection of a D^+ or D^- animal. This estimate is based on the assumption that the number of D^+ animals in the population, d, is decreased by a non-integer amount at each selection, proportional to the probability that the animal chosen was D^+. Calculation of the approximation is still complex (involving a summation over n terms) but is much faster than calculation of the exact hypergeometric probability.

2.5.2. Performance of the approximation

While in most situations the approximation provides a result almost identical to the true probability, the difference can be important in some circumstances. The formula was evaluated by comparing it to the true probability (as obtained from the modified hypergeometric Eq. (8) and also to the probability assuming an infinite population (using the binomial Eq. (4)). Performance was evaluated over a range of population sizes (N) from 5 to 150, and over a range of sample sizes (n from 5 to N). For each combination of N and n, the probability of detecting a number x of T^+ animals from a population with a prevalence of 0.2 using a test with sensitivity 0.95 and specificity 0.95 was calculated over all possible values of x (from zero to n). The difference between the true probability and the probability predicted by the formula was squared, and the mean of these squared differences taken over the $n+1$ values of x. The square root of this mean, the root mean square error (RMSE), was recorded for each combination of N and n. RMSE is a measure of the average performance of the formula over the entire probability distribution, and can be expressed in the same terms as the probability (i.e. as a proportion or percentage).

The 11,026 data points produced were analysed by fitting an error surface to the three-dimensional data (N on the x axis, n (expressed as a percentage of N) on the y axis, and RMSE in the z axis) using a distance-weighted least-squares smoothing procedure (Anon., 1995). Fig. 1 shows the error-surface contours for the approximate formula and Fig. 2 shows the error surface contours for the simple binomial (infinite population) formula for comparison.

These graphs may be used to decide whether the use of the approximation is adequate for a particular purpose. The 0.01 contour represents the combinations of population size and sample size (as a percentage of the population size), that yield an average error in the probability estimate of 1%. If this level of accuracy is deemed to be the maximum error permissible, the approximation can be safely used with population and sample size combinations falling in the area below the 1% contour. For example, one may use sample sizes of less than 60% of the population (for small populations of less than 30), or sample sizes of less than 80% of the population for populations of 60 or above. For larger populations (greater than about 150), the formula yields accurate results when as many as 90% of the population are sampled (as may be necessary when examining herds with tests of relatively low sensitivity or specificity). By comparison, the binomial formula for infinite population sizes (Fig. 2) is, not surprisingly, decidedly inferior for population sizes in the range shown.

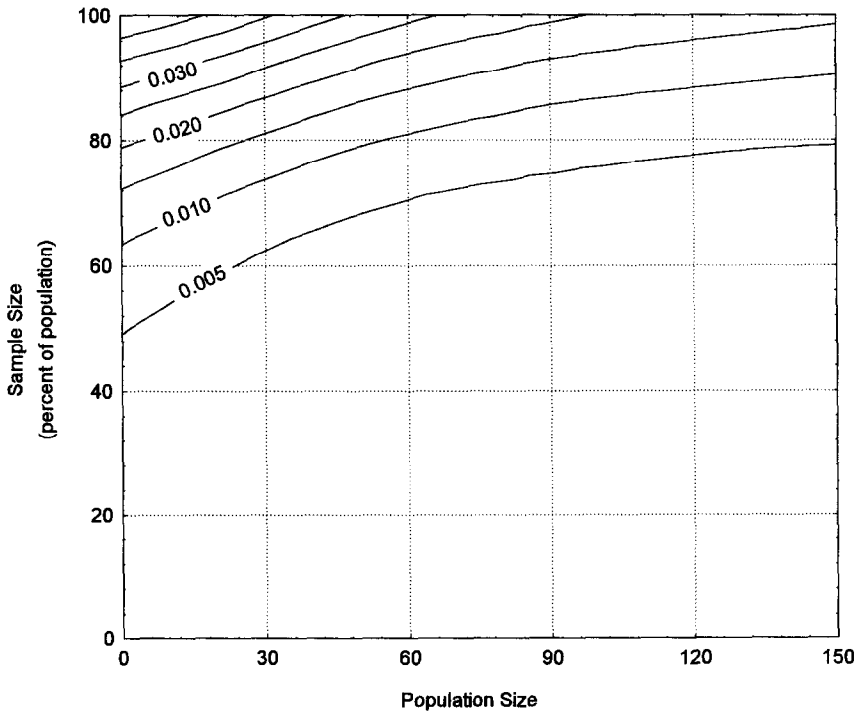

Fig. 1. Error–surface contour graph for the root mean square error of the probability distribution produced by the modified binomial approximation to the hypergeometric for a range of population and sample sizes. Root mean square error contour interval width = 0.005.

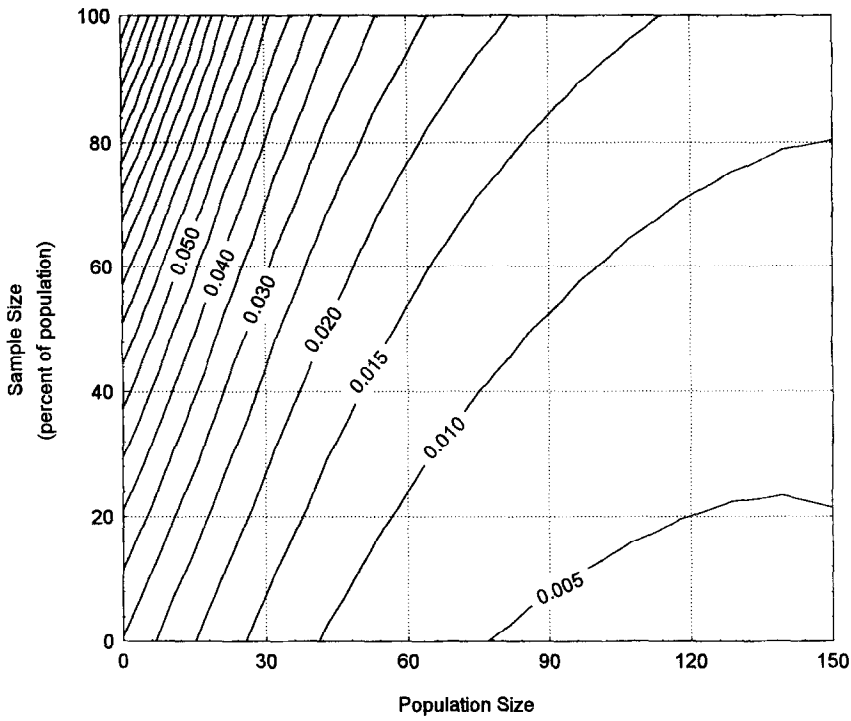

Fig. 2. Error–surface contour graph for the root mean square error of the probability distribution produced by the simple binomial (infinite population) formula for a range of population and sample sizes. Root mean square error contour interval width = 0.005.

The results shown are valid only for a prevalence of 0.2, sensitivity of 0.95 and specificity of 0.95. The relationships between prevalence, sensitivity, specificity and RMSE are complex and difficult to generalise. Increasing prevalence may either increase or decrease RMSE depending on sensitivity and specificity. Varying sensitivity and specificity independently result in a maximum RMSE at either a sensitivity or specificity of 0.75. The error decreases more rapidly towards 0.5 than it does towards 1, and when a very high proportion of the population is sampled, the maximum RMSE occurs at a sensitivity or specificity of 1.

3. Sample size calculation

3.1. Establishing the hypothesis

When conducting a survey to prove freedom from disease, the null hypothesis, H_0 is that disease is present at a level equal to or greater than a specified prevalence. This prevalence may be chosen in two ways. For within-herd surveys, the prevalence

represents the minimum prevalence expected for a disease should it be present (highly contagious diseases, with long-lasting antibodies, might be expected to have very high minimum seroprevalences, while rare genetic diseases may have very low prevalences). Alternatively, the prevalence may be chosen to represent the population's level of disease that is small enough to be considered negligible or where, for infectious diseases, epidemic theory suggests it would move towards extinction even without intervention. For national-level surveys, the prevalence of disease-positive herds may be very low (regardless of the within-herd prevalence of positive herds). Choosing a minimum expected [2] prevalence of, say, 1% of herds affected results in a survey that is unlikely to be able to detect a prevalence of $< 1\%$. A survey indicating freedom from disease in such a case is, in fact, saying that if disease is present, it is present at a prevalence of $< 1\%$.

The alternative hypothesis, H_A, is that the disease is present at a level lower than the specified prevalence. Thus:

H_0: Prevalence $\geq p$

H_A: Prevalence $< p$.

3.2. Calculating the sample size

If we assume that there is no disease present (the alternative hypothesis, H_A), a probability distribution can be drawn based on a given sample size (e.g. dotted lines in Fig. 3). This distribution (or its cumulative equivalent) can be used to calculate the maximum number of reactors that would be observed with a probability of $1 - \beta$, if the population were free from disease. The value β (probability of making a type II error or accepting the null hypothesis in the absence of disease) marks the upper tail of the distribution, and is used as the cutpoint for the maximum number of reactors if the disease is not present.

If the probability distribution based on the null hypothesis (disease present at prevalence $\geq p$) is drawn, the cumulative probability of observing a number of reactors less than or equal to this same cutpoint can be calculated. If this probability is high, then the maximum number of reactors likely to be drawn from a population *without* disease could alternatively be likely to be drawn from a population *with* disease, making it difficult to distinguish between the two populations. If the probability is low, then it is unlikely that a number of reactors less than or equal to the cutpoint would be drawn from a diseased population.

[2] For simplicity, the term 'minimum expected prevalence' is used throughout this paper. At the animal-level within a single herd, this is the minimum prevalence that would be expected if the disease were present in the herd (based on a knowledge of the biology of the disease). At the herd-level, this is the lowest non-zero prevalence of diseased herds that would be considered unacceptable (based on political, economic or other considerations).

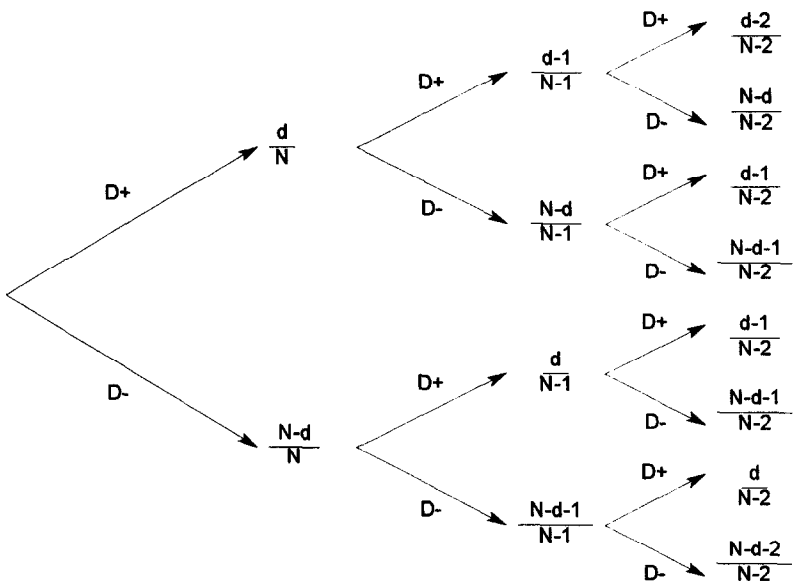

Fig. 3. Distributions showing the probability of observing a given number of reactors for a population with zero prevalence (dotted lines) and prevalence = 0.2 (solid lines), given two different sample sizes. Population size 100,000; sensitivity = specificity = 0.95.

At low sample sizes, the distributions (for the null and alternative hypotheses) have a wide overlap as can be seen from the left graph in Fig. 3 (graph a). As the sample size increases, the distributions become more separated, with a smaller overlap as shown on the right in Fig. 3 (graph b). The required sample size is the value at which the number of reactors at the cutpoint with a probability of $1-\beta$ from the distribution with zero prevalence is equal to the number of reactors occurring with probability α at the left tail of the distribution with prevalence = p.

This procedure (described in detail in Appendix B) has been implemented in a computer program called FreeCalc. It was written in Borland Pascal [3] to run under MS DOS and includes sample-size and data-analysis modules. Features include a user-friendly mouse or keyboard interface and a comprehensive context-sensitive help system. All parameters used in calculations are able to be customised by the user, including β and α (according to the significance of these two types of error) and the formula to be used in probability calculations (the exact hypergeometric (Eq. (8)), modified binomial approximation (described in Appendix A), or infinite population binomial formulae (Eq. (4))). The program is available free of charge over the Internet on the World Wide Web at the EpiVetNet Web site (http://epiweb.massey.ac.nz). No restriction is placed on the distribution of the program, and users are encouraged to pass it on to colleagues. Use of the program should always be acknowledged in reports, scientific papers and presentations.

[3] Borland Pascal Version 7, ©1983, 1992, Borland International.

4. Example

4.1. Foot and mouth disease

Let us assume that an outbreak of FMD has occurred in a previously free area. After the outbreak has been controlled, an effort is made to quickly show that the disease is no longer present. An unaffected herd of 265 animals within the control zone around the outbreak is to be examined two months after the outbreak to determine the presence of the disease. Let us assume that the test used is an ELISA with a sensitivity of 0.95 and specificity of 0.98. The highly infectious nature of the disease suggests that if the disease had passed through the herd, at least 30% of animals should have detectable titres (a more conservative approach would be to choose a lower expected herd prevalence).

The program can be used to calculate the sample size required to establish whether the herd is free from disease or not. The sensitivity (95%) and specificity (98%) of the test are entered, as well as the minimum expected prevalence (30%) and the population size (265). The values of β (the probability of falsely accepting the null hypothesis) and α (the probability of falsely rejecting it) can be adjusted. In this case, let us assume that values of 0.05 are chosen for both. The exact hypergeometric probability formula is selected, and the 'Calculate' button pressed. After 7 iterations taking about 2 s (on a 486 33-MHz computer), a sample size of 14 is reported. The value of 14 was determined on the 6th iteration, with a reactor cutpoint level of 1, and the probability of observing 1 or fewer animals under the null hypothesis of 0.046. This tells the operator the following information: (i) if the herd is uninfected, the probability of observing ≤ 1 reactors from a sample of 14 is equal to or just greater than 0.95 (power); and (ii) if the herd is infected with a prevalence of 30%, the probability of observing 1 or fewer reactors is equal to 0.046 (the closest value achieved $\leq \alpha$).

The modified binomial approximation formula produces a sample size of 14 as well, in about 1 s. The probability of observing ≤ 1 animals under the null hypothesis is underestimated by 1.14×10^{-5}. By contrast, the assumption of a perfect test reduces the sample size to 9, an infinite population with the imperfect test produces the sample size of 14, and a perfect test and infinite population requires a sample of 9. A more conservative value of 10% for the minimum expected prevalence (instead of 30%) yields a sample size of 62 animals with a cutpoint number of reactors of 3. Assuming a perfect test reduces this to 27, an infinite population with the imperfect test yields 67, and a perfect test with infinite population requires a sample size of 29.

Let us assume that a sample of 62 animals is eventually taken from the herd (based on the conservative assumption of a minimum expected prevalence of 10%), and that 2 animals show positive reactions to the ELISA. The analysis module of the program can be used to help interpret this result. The sensitivity, specificity, minimum expected prevalence, and herd size are entered as above, followed by the sample size (62) and number of reactors (2). Pressing 'Calculate' produces the result that the probability of observing 2 or fewer reactors under the null hypothesis is equal to 0.013. We can therefore conclude with a high level of confidence that the herd is not diseased, and that the two reactors were probably due to the imperfect specificity of the test.

Finally, let us imagine that 5 animals tested positive instead of 2. Using the same approach, the analysis module tells us that the probability of observing 5 of fewer animals under the null hypothesis is 0.244. In this instance, the herd would be considered as infected until more information can be obtained.

Note that no attempt has been made to estimate the true prevalence based on the results of the survey. This is because the survey was not designed to make an estimate of the prevalence, but to determine how likely it was that disease was present in the herd.

4.2. Paratuberculosis

In contrast to FMD (a highly infectious disease for which good tests are available), paratuberculosis (Johne's Disease) is a disease of low infectivity. Several tests are available, but one practical screening test is the absorbed ELISA. For example, let us assume that the sensitivity is 60% and specificity is 99% (Ridge et al., 1991). The minimum expected prevalence of this slow-spreading disease might be estimated at 2%. When calculating the sample size required to show freedom from paratuberculosis for a herd of the same size as before (265 animals), FreeCalc reports that it is unable to achieve the required accuracy even by sampling every unit. With a sample size of 265 (the whole herd), the probability of observing 6 reactors from a disease-free herd is 0.052, while the probability of observing 6 reactors from an infected herd with a prevalence of 2% is 0.695. The test is therefore unable to distinguish between an infected and uninfected herd at the 95% level of confidence as specified.

In larger herds, one approach to overcoming this problem is to increase the sample size. From a herd of 1000 animals, a sample of 989 is able to detect disease at the required confidence level. For smaller herds, this is not possible. The second approach is to lower the required power and/or level of confidence of the survey. Reducing the power from 95% to 72%, and the confidence level from 95% to 85% means that a sample of 259 animals from 265 will meet the requirements (again, this is not a very satisfactory solution). A third option is to relax (i.e. raise) the minimum expected or tolerable prevalence that the survey is required to detect. A sample of 237, with a cutpoint number of reactors of 5 is adequate to detect prevalences $\geq 5\%$ in a herd of 265. While this is perhaps the practical limit of the accuracy of the ELISA, many herds can have a lower non-zero prevalence and be missed. The last option is to increase the sensitivity (modify the test, use a different test, or use tests in parallel). In this example, changing the critical value of the ELISA at which an animal is said to be infected may achieve the desired result. Let us assume that shifting the critical value produces a test with sensitivity of 72.9% and specificity of 84.8% (Spangler et al., 1992). The new form of the test is able to achieve the required level of precision with a sample size of 248 from a herd of 265, and a cutpoint number of reactors of 44.

This example serves to demonstrate that the use of tests of low sensitivity to attempt to substantiate freedom from diseases of low prevalence is extremely difficult. Even when practically achievable sample sizes are less than those recommended by the formula, the survey results may, by chance, be extreme enough to provide a definitive answer at the level of confidence required.

5. Discussion

The formula presented in this paper yields the exact probability of observing a given number of diseased animals, when sampling from a finite population with an imperfect test. We have also presented an approximation to this formula, which is computationally somewhat simpler, and shown the limits of accuracy for this approximation. These formulae have important application to the planning and analysis of surveys to substantiate freedom from disease. First, they may be used to calculate the precise sample size required for such surveys. Secondly, they enable the results of these surveys to be accurately analysed.

Unlike the formulae in common use, the new formulae are mathematically complex. While they provide a sound basis for the conduct of surveys for herd accreditation or substantiation of national disease status for international trade, their complexity could hamper the adoption of this approach by disease control authorities. The FreeCalc program was developed to overcome this problem.

An interesting and potentially important characteristic of probability formulae that consider finite populations (including the new formula described here) arises when the number of diseased animals in a population is expressed in terms of an estimate of prevalence. In small populations, prevalence can take only a finite number (N) of discrete values. When the estimated prevalence is used, d must be calculated by rounding pN to an integer value. Rounding down (truncating) gives the most conservative estimate. With increasing population size, d increases in integer steps (with an interval equal to the inverse of p) rather than smoothly in proportion to N. The true prevalence (d/N) varies between p and slightly below p. This gives rise to the paradoxical situation where, although increasing N may be expected to give an increasing probability of detecting a given number of fewer test positive animals from the population, sometimes increasing N by 1 results in a fall in the probability. An awareness of the difference between estimated prevalence and the actual number of infected animals in a population of a given size will avoid confusion.

The use of the FreeCalc computer program enables a valid probabilistic approach to herd-level assessment. This will be of significant value to disease control authorities when large numbers of herds are to be tested, as is common in either accreditation schemes or national surveys to prove freedom from disease. This probabilistic approach means that costly and time consuming follow-up of positive reactors may not be necessary, and that the results of testing can be reported with more soundly based measures. This issue requires further research.

The program also accommodates the calculation of sample sizes for two-stage sampling. Most large-scale livestock surveys use a two-stage sampling scheme both to overcome problems with true random sampling from a large population, and to account for the clustering of disease within herds. When planning a two-stage sampling survey, sample sizes need to be calculated for both the first stage (selection of herds) and the second (selection of animals with selected herds). The use of the FreeCalc program to calculate cost-effective sample sizes for two-stage sampling surveys has been described (Cameron and Baldock, 1998).

Acknowledgements

This research was conducted as part of a project funded by the Australian Centre for International Agricultural Research, working in cooperation with the Thai Department of Livestock Development. Angus Cameron is supported by a research fellowship from the Australian Meat Research Corporation.

Appendix A. Derivation of binomial approximation

Fig. 4 shows the probability tree for selection from a finite population. If π_i is the probability of selection a disease-positive animal at the ith selection, when using a perfect diagnostic test in a finite population, $\pi_1 = d/N$, $\pi_2 = (d-1)/(N-1)$, $(1-\pi_{x+1}) = (N-d)/(N-x)$ and $(1-\pi_n) = (N-d-n+x+1)/(N-n+1)$. The probability of choosing x positive animals in any order, is given by the hypergeometric distribution. At each selection of a positive animal, the remaining number of positives is decreased by one, and the total number of animals is decreased by one. When a negative animal is selected, the remaining pool of negatives is decreased by one. The probability of selecting the next animal is then dependent on the remaining pool of positive and negative animals.

When using an imperfect test and the outcome of interest is not D^+ but T^+, the selected T^+ animal may be D^+ or D^-. For a T^+, the probability that the animal is truly D^+ (positive predictive value) is given by the Bayes Rule:

$$P(D^+|T^+) = \frac{P(D^+)\mathrm{Se}}{P(D^+)\mathrm{Se} + P(D^+)(1-\mathrm{Sp})} \tag{9}$$

An approximation to the exact probability may be made by assuming that when a T^+ animal is selected, the pool of D^+ animals will be decreased by a 'fraction of an animal' equal to $P(D^+|T^+)$. At the same time, the pool of D^- animals will be decreased by $P(D^-|T^+)$, the complement of $P(D^+|T^+)$. This will result in an overall decrease in N of one animal. In the same way, when a negative animal is selected, the pool of D^+ animals is decreased by $P(D^+|T^-)$ and the D^- pool is decreased by $P(D^-|T^-)$. This non-integer population of animals represents the mean expected population over many trials.

Unfortunately, the probability of drawing T^+ and then a T^- is not the same as the probability of drawing T^- then T^+ when this approach is used. The usual method of calculating the probability (first drawing all the T^+ followed by drawing $n-x$ T^-, and multiplying by the number of different possible combinations) will result in a biased estimate. An approximation that can be used to overcome this problem is to calculate the probability of drawing x T^+ based on the 'average' combination. This represents the combination where the T^+'s are spread evenly through the n animals. Multiplying the probability of the average combination by the number of possible combinations yields a good estimate of the sum of all combinations.

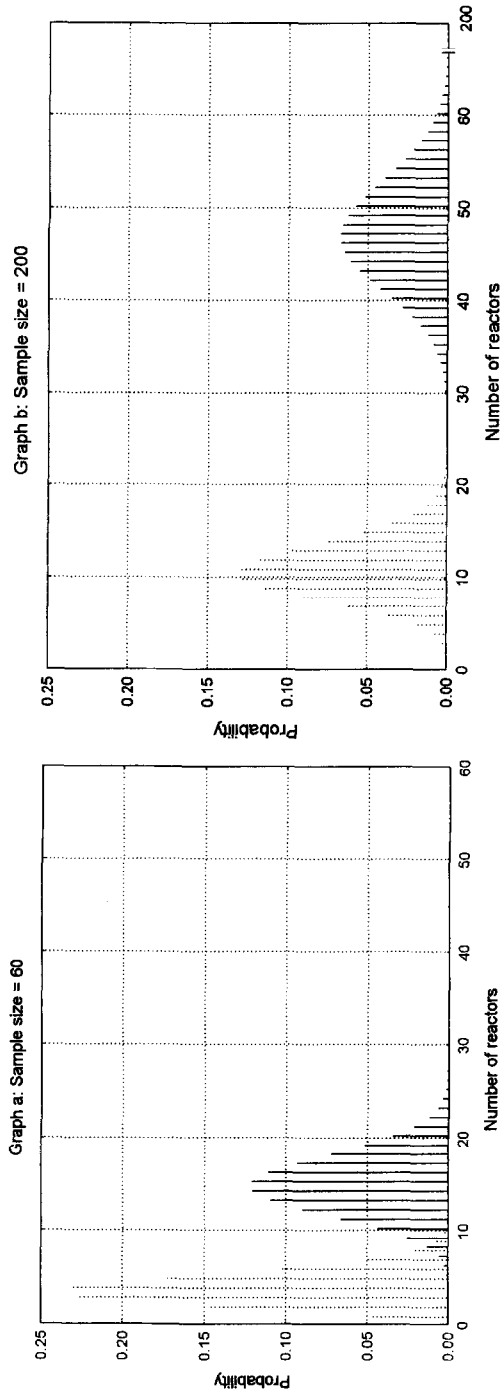

Fig. 4. Probability tree for the selection of three animals.

The formula is most practically calculated using a computer program that keeps a tally of the remaining pool of T^+ and T^-. If *combination* is an array of n boolean values (with x true values, and $n-x$ false values regularly spaced) representing the 'average' combination of x T^+ and $n-x$ T^-, *pos* is the initial number of diseased animals in the population, *neg* is the initial number of non-diseased animals, and *sens* and *spec* are sensitivity and specificity of the test, the following pseudo-code may be used for the calculation.

```
for counter = 1 to n
 if combination[counter] is true then                {the animal tests positive}
  Prob1 = (pos/(pos + neg)) × sens                   {P(T+ D+)}
  Prob2 = (neg/(pos + neg)) × (1 − spec)             {P(T+ D−)}
 else
  Prob1 = (pos/(pos + neg)) × (1 − sens)             {P(T− D+)}
  Prob2 = (neg/(pos + neg)) × spec                   {P(T− D−)}
 endif
 probability = probability × (Prob1 + Prob2)         {cumulative product}
 pos = pos − (Prob1/(Prob1 + Prob2))                 {decrease the pool of T+}
 neg = neg − (Prob2/(Prob1 + Prob2))                 {decrease the pool of T−}
end
probability = (n choose x) × probability             {multiply by number of combinations}
```

Appendix B. Sample size calculation

A trial and error procedure is used to calculate the required sample size. An arbitrary starting sample size (50) is chosen, and the probability of falsely concluding that disease is not present is calculated. If this probability is higher than the required level of α, the sample size is increased, and the calculation starts again. If it is lower than the required level of α, the sample size is decreased. The process is continued until a value equal to or just smaller than α is reached.

The cutpoint for a certain sample size represents the maximum number of reactors that could be observed with $1-\beta$ probability if the population is disease-free. This is calculated by first determining the probability of observing no reactors. If this probability is less than $1-\beta$, the cumulative probability of observing 1 or fewer reactors is calculated. This is repeated until the probability is equal to or slightly greater than $1-\beta$.

The cumulative probability of observing a number of reactors equal to or less than the cutpoint is calculated by summing the probabilities of observing 0, 1, 2... reactors up to the cutpoint, based on a population with disease prevalence as set by the null hypothesis. This cumulative probability is compared with α to assess whether the sample size is correct, too large or too small.

The sample size is calculated on the basis of a cutpoint which is chosen to achieve a specified value of β. This cutpoint is calculated separately for each sample size,

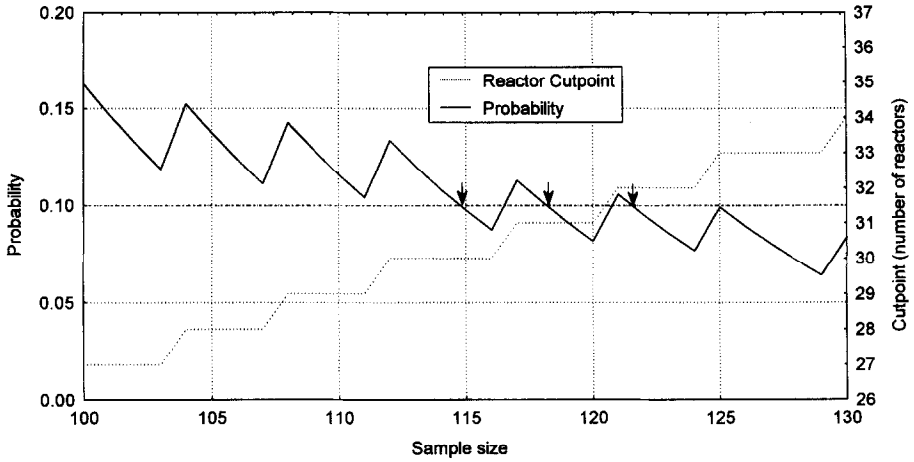

Fig. 5. Effect of sample size on cutpoint and probability. Test sensitivity = 0.8, specificity = 0.8, prevalence = 0.2, population size 1000. The arrows mark the points at which the probability falls below 0.1.

considering the population size, test sensitivity and specificity. Because cutpoints can only increase by integer values, the probability curve follows a saw-tooth shape as shown in Fig. 5. Although an increase in sample size usually leads to a decrease in probability, when there is a step in the cutpoint, an increase in sample size leads to a sharp increase in probability. In the example shown in Fig. 5, if a value of 0.1 had been chosen for α, there are 3 points (marked with arrows) at which the probability curve falls below the α value. The point with the lowest sample size is the one required, but the trial and error search technique may arrive at any of these points.

To overcome this problem and identify the first point with the lowest sample size, the cutpoint is reduced by one, and the new sample size calculated (corresponding to the low-point of the previous saw-tooth in Fig. 5). If the probability for this lower sample size is less than the α value, the process is repeated, until the lowest cutpoint yielding a probability equal to or less than α is found. Finally, the sample size is progressively reduced by one, until the lowest sample size is found (moving up the selected saw-tooth until it intersects with the α probability level of 0.1).

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12 attachments (4 MB)

AI 2022 BC BC-820 Dave Bilinski 2024-12-284206 Q AMENDMENT(22930) Koetsier,M.pdf; AI 2022 BC BC-820 Dave Bilinski 2024-12-304204 (22873) Zhang,I.pdf; AI 2022 BC BC-820 Dave Bilinski 2024-12-31 1509 Gen (22875) Zhang,I.pdf; AI 2022 BC BC-820 Dave Bilinski 2024-12-314202 (22874) Zhang,I.pdf; Biosecurity for owners of an IP.pdf; Blank LOD.pdf; H275Y Mutation_BCpoultry_12092024_forIndustry_final_signed.pdf; Privacy Notice Statement for Animal Disease Investigations.pdf; Requirement to Quarantine - Producer Information Sheet.pdf; What to Expect - Step by Step.pdf; AI General Information.pdf; BC CDC Letter 2024.pdf;

From: **West AI Case Officer Seven / Ouest IA Agent de cas sept (CFIA/ACIA)** <cfia.WestAICaseOfficerSeven-OuestIAagentdecassept.acia@inspection.gc.ca>
Date: Thu, Jan 2, 2025 at 10:33 AM
Subject: Initial Documents BC-820-IP-233
To: universalostrich@gmail.com <universalostrich@gmail.com>, universalostrich@hotmail.com <universalostrich@hotmail.com>
Cc: West AI Case Officer Seven / Ouest IA Agent de cas sept (CFIA/ACIA) <cfia.WestAICaseOfficerSeven-OuestIAagentdecassept.acia@inspection.gc.ca>

Hello!

Apologies for not getting this sent right after our call this morning! As discussed earlier, because of the complex situation, many of the attached information documents won't reflect the process as they're geared to commercial poultry farms. So, in the document list below, I've highlighted the documents most important for you to review.

As you are aware, your premises has been identified as an infected premises for Avian Influenza. Regulatory actions on your premises will be put into place immediately.
For your reference, there is a lot of useful information regarding avian influenza and the role of CFIAon our external website: Avian Influenza (bird flu) - Canadian Food Inspection Agency (canada.ca)
I have been assigned as your case officer and will serve as your primary contact for any issues/questions that come up throughout this process. Likewise, any questions that CFIA has for you should come through me.
Attached to this email are the legal documents related to your premises. These include:

1. Order to dispose of animals or things (4202)
2. Declaration of infected place (4204)
3. Requirement to quarantine (4206)
4. Licence for removal of animals or things (1509). This last document describes the animals/things that can move from your premises without restriction, provided sound biosecurity (see biosecurity protocols for holders of licences, in your initial quarantine

email). Anything that needs to move other than this, or to enter the restricted zone on your premises (eg. delivery of shavings for compost) must do so under provisions of a movement permit.
5. BC CDC Letter
6. Biocontainment procedures for owners of IPs and AI general Information sheet
7. Privacy Notice Statement
8. A Generic What to expect- Step by step document of the process
9. **Letter of Direction – this needs to be signed by you, the producer for any third party (non CFIA) depopulation activities to take place. I will need you to sign the attachment and send back to me as soon as you can via email.**

Next steps:

- As discussed on the call earlier this morning, I'll send you a Microsoft Teams link to join our meeting scheduled for tomorrow, January 3, 2025 at 13:00 PST. This meeting is an epidemiologic questionnaire and will discuss layout of premises, movements on and off the property, clinical history of birds on site, ect. These calls range 1-3 hours normally. Given the situation – I'd expect it to maybe be longer, so please plan for that. It's always helpful to have a calendar and flock health records on hand for the call.
    - If you can, please send me any flock health records or visitor logs from the past month or two. You can send these via text.
- I will be sending you an another email shortly about the paperwork needed to start the process of the depopulation exemption.

I think that's all I have for now. Please don't hesitate to text or call me at the number below if you have any questions.

Kind regards,

Cassandra Berreth

Case Officer 007
Western Area Avian Influenza Response
Lethbridge, AB
Canadian Food Inspection Agency
cfia.WestAICaseOfficerSeven-OuestIAagentdecassept.acia@inspection.gc.ca
Call or Text: 403-795-9461

Government of Canada | Gouvernement du Canada

Canadian Food Inspection Agency | Agence canadienne d'inspection des aliments

File Number / Numéro de dossier
BC-820-IP-233 22930

HEALTH OF ANIMALS ACT

NOTICE

REQUIREMENT TO QUARANTINE AND/OR LICENSE TO TRANSPORT ANIMALS OR THINGS

LA LOI SUR LA SANTÉ DES ANIMAUX

AVIS

OBLIGATION DE METTRE EN QUARANTAINE ET/OU PERMIS DE TRANSPORTER DES ANIMAUX OU DES CHOSES

To: / À :

Universal Ostrich
Owner Name (legal owner of premise): Dave Bilinski
Email: universalostrich@gmail.com
Phone #: 778-692-9389
301 Langille Road, Edgewood, BC, V0G 1J0

Location of Animal(s)/Thing(s) - Endroit où se trouvent l'(les) animal(aux) ou la(les) chose(s)

301 Langille Road, Edgewood, BC, V0G 1J0
Lat: 49.862402 Long: -118.149296
Premise ID: BC44K4PMR

The requirement must be met in the following manner during the period commencing on the date of this notice

I find or suspect that the animals/things described below are affected or contaminated by AVIAN INFLUENZA

Pursuant to section 6/9/59 of the Health of Animals Regulations, I therefore require you as the owner or person having the possession, care or control of the animals/things described below to quarantine the animals/things described below.

All birds/carcasses are kept indoors or in the barn. Confine to the above described premises in such manner that there is no contact with any birds, animals, humans (other than humans involved in the care or disposal of birds), and other things exposed to birds including things related to the conveyance, care and maintenance of avians and the care and maintenance of the premises which may result in transmission of the disease.

Report any signs of avian influenza or increased mortality to the Canadian Food Inspection Agency (CFIA) immediately. Complete the flock health quesionnaire provided and return to the CFIA at the specified times. Quarantine conditions must remain in effect until released by an inspector of the Canadian Food Inspection Agency.

Any of the above-mentioned animals or things will require a License to Transport Animals or Things from CFIA in order to move or to be removed from the site.

L'obligation imposée doit être remplie de la façon suivante à compter de la date du présent avis

Je constate ou soupçonne que les choses ou les animaux visés ci-dessous sont atteints ou contaminés par _____

Conformément aux articles 6, 9 et 59 du Règlement sur la santé des animaux, vous êtes tenu, en qualité de propriétaire ou de personne qui a la possession, la responsabilité ou la charge des soins des choses ou des animaux visés ci-dessous, de mettre en quarantaine les choses ou les animaux en question.

2024-12-28
Date

Signature

MEGHAN KOETSIER
Name of Inspector / Nom de l'inspecteur

Telephone / Téléphone

TERMINATION OF QUARANTINE
TERMINAISON DE QUARANTAINE

Date

Signature

Name of Inspector / Nom de l'inspecteur

Telephone / Téléphone

	Identification Number / Numéro d'identification	Age / Âge	Sex / Sexe	Description of Animal(s) or Thing(s) / Description de l'(des) animal(aux) ou de la(des) chose(s)
1				"All animals of susceptible species on-site (see below) and any related
2				animal products, by-products and things along with any animals,
3				products, by-products and things having contact with them".
4				
5				Description of susceptible species present on-site:
6				All Avian species on this premise.
7				
8				Sick bird Call Log#:773
9				
10				This revokes and replaces CFIA/ACIA Form 4206Q Requirement to
11				Quarantine Animals and/or Things File Number: BC-820 22839 issued by
12				Xiang Zhang on 2024-12-30. Amendment to backdate the 4206Q, verbal
13				quarantine was placed 2024-12-28.
14				

The information on this document is collected by the Canadian Food Inspection Agency under the authority of the Health of Animals Act for the purpose of protecting human and animal health. Information may be accessible or protected as required under the provisions of the *Access to Information Act.*

Les renseignements figurant dans le présent document sont recueillis par l'Agence canadienne d'inspection des aliments en vertu de la loi sur la santé des animaux afin de protéger la santé des personnes et des animaux. Les renseignements peuvent être accessibles ou protégés selon ce que prescrit la *Loi sur l'accès à l'information.*

CFIA / ACIA 4206 (2011/08)

Canada

Quarantine

The following provisions of the Health of Animals Regulations relate to the requirement to quarantine animals or things:

6. Where an inspector finds or suspects that:

a) a thing is a disease agent,
b) an animal or thing is affected by or contaminated with a communicable disease, or
c) any record or document required by or under the Act and these Regulations to prevent the spread of any disease within Canada, or to any other country from Canada, by an animal or thing is not produced for inspection by an inspector,

the inspector may order the person who owns or has possession, care or control of the animal or thing, to quarantine the animal or thing, and the provisions of section 91.4 apply.

9. Where an inspector finds or suspects that:

a) a thing is a disease agent,
b) an animal or thing imported into Canada is affected by or contaminated with a communicable disease, or
c) any information or documentation required by or under the Act and these Regulations to prevent the introduction of Any disease into Canada by an animal or thing is not presented to an inspector,

the inspector may order the person who owns or has possession, care or control of the animal or thing to quarantine the animal or thing, and the provisions of section 91.4 apply.

59. The Minister may, for the purpose of preventing the introduction of communicable disease into Canada or into any other country from Canada, require any animal imported into Canada to be quarantined, and the provisions of section 91.4 apply.

91.4(1) Where an inspector orders a quarantine of a disease agent, animal or thing, the notice of quarantine shall be communicated by personal delivery to the person who owns or has possession, care or control of the disease agent, animal or thing and the notice may specify the manner, condition, place or places and time of quarantine, necessary to prevent the spread of the communicable disease.

2) In respect of a disease agent, animal or thing quarantined pursuant to these Regulations, no person shall do or permit to be done any of the following actions, without the authorization of an inspector:

a) remove the disease agent, animal or thing from the place of quarantine;
b) allow the disease agent, animal or thing to come into contact with an animal that is not quarantined under the same quarantine order;
c) destroy the disease agent, animal or thing; or
d) treat or test the disease agent, animal or thing for a communicable disease.

(3) Every person who owns or has the possession, care or control of an animal quarantined pursuant to these Regulations shall immediately notify a veterinary inspector of any quarantined animal that appears sick.

(4) In respect of a disease agent or thing quarantined pursuant to these Regulations, no person shall do or permit to be done any of the following actions, without the authorization of an inspector:

a) move the disease agent or thing;
b) alter the appearance of the disease agent or thing;
c) remove of any tag, sign or other notice that the disease agent or thing is under quarantine; or
d) open any container or remove any wrapping or cover around the disease agent or thing.

(5) No person shall transport or cause to be transported a disease agent, animal or thing quarantined pursuant to these Regulations unless:

a) a licence for its transportation has been issued by an inspector;
b) a copy of the licence issued pursuant to paragraph (a) has been provided to the person in charge of the conveyance transporting the disease agent, animal or thing;
c) and the disease agent, animal or thing is transported directly to the location stated in the licence.

(6) Every person who receives a notice referred to in subsection (1) shall comply with the notice.

Penalty

Section 66 of the *Health of Animals Act*:

66. Every person who fails to comply with a notice delivered to the person under section 18, 25, 27, 37, 43 or 48 or the regulations is guilty of:

a) an offence punishable on summary conviction and liable to a fine not exceeding fifty thousand dollars or to imprisonment for a term not exceeding six months, or to both; or
b) an indictable offence and liable to a fine not exceeding two hundred thousand dollars or to imprisonment for a term not exceeding two years, or to both.

Quarantaine

Les dispositions suivantes du Règlement sur la santé des animaux ont trait à l'obligation de mettre en quarantaine des animaux ou des choses :

6. L'inspecteur peut ordonner au propriétaire d'un animal ou d'une chose ou à la personne en ayant la possession, la responsabilité ou la charge des soins de le mettre en quarantaine, auquel cas les dispositions de l'article 91.4 s'appliquent, lorsqu'il constate ou soupçonne que :

a) la chose est un agent causant une maladie;
b) l'animal ou la chose est affecté ou contaminé par une maladie transmissible;
c) tout registre ou documentation exigé en vertu de la Loi ou du présent règlement afin de prévenir la propagation de toute maladie au sein du Canada, ou du Canada à un autre pays, par l'animal ou la chose, ne lui est pas fourni aux fins d'inspection.

9. L'inspecteur peut ordonner au propriétaire d'un animal ou d'une chose ou à la personne en ayant la possession, la responsabilité ou la charge des soins de le mettre en quarantaine, auquel cas les dispositions de l'article 91.4 s'appliquent, lorsqu'il constate ou soupçonne que :

a) la chose est un agent causant une maladie;
b) l'animal ou la chose est importé et est affecté ou contaminé par une maladie transmissible;
c) tout renseignement ou documentation exigé en vertu de la Loi ou du présent règlement afin de prévenir l'introduction de toute maladie au Canada, par l'animal ou la chose, ne lui est pas fourni.

59. Le ministre peut, afin de prévenir l'introduction de maladies transmissibles au Canada, ou dans un autre pays depuis le Canada, exiger que tout animal importé au Canada soit mis en quarantaine, auquel cas les dispositions de l'article 91.4 s'appliquent.

91.4(1) Lorsqu'un inspecteur ordonne la mise en quarantaine d'un agent causant une maladie, d'un animal ou d'une chose, l'avis de mise en quaranatine doit être remis en main propre au propriétaire de l'agent, de l'animal ou de la chose ou à la personne en ayant la possession, la responsabilité ou la charge des soins, et cet avis peut préciser les modalités, les conditions, le ou les lieux et le délai de quarantaine nécessaires pour prévenir la propagation de la maladie transmissible.

(2) En ce qui concerne un agent causant une maladie, un animal ou une chose mis en quarantaine aux termes du présent réglement, il est interdit, sans l'autorisation d'un inspecteur, de prendre les mesures suivantes ou de permettre qu'elles soient prises :

a) retirer l'agent, l'animal ou la chose du lieu de quarantaine;
b) laisser l'agent, l'animal ou la chose entrer en contact avec un animal qui n'est pas mis en quarantaine en vertu de la même ordonnance;
c) détruire l'agent, l'animal ou la chose;
d) traiter l'agent, l'animal ou la chose pour une maladie transmissible ou mener des tests de dépistage à cet égard.

(3) Le proprétaire d'un animal mis en quarantaine aux termes du présent règlement, ou la personne en ayant la possession, la responsabilité ou la charge des soins, doit sans délai aviser un vétérinaire-inspecteur lorsque l'animal semble malade.

(4) En ce qui concerne un agent causant une maladie ou une chose mis en quarantaine aux termes du présent règlement, il est interdit, sans l'autorisation d'un inspecteur, de prendre les mesures suivantes ou de permettre qu'elles soient prises :

a) déplacer l'agent ou la chose;
b) en modifier l'apparence;
c) enlever une étiquette, une indication ou un autre avis précisant que l'agent ou la chose est en quarantaine;
d) ouvrir un contentant ou enlever un emballage dans lequel se trouve l'agent ou la chose ou en enlever la couverture.

(5) Il est interdit de transporter ou de faire transporter un agent causant une maladie, un animal ou une chose mis en quarantaine aux termes du présent règlement, sauf si :

a) un permis pour son transport a été délivré par un inspecteur;

b) une copie du permis a été fournie à la personne chargée du véhicule qui transporte l'agent, l'animal ou la chose;

c) l'agent, l'animal ou la chose est transporté directement à l'endroit indiqué sur le permis.

(6) Quiconque reçoit l'avis visé au paragraphe (1) doit s'y conformer.

Pénalité

L'article 66 de la *Loi sur la santé des animaux*:

66. Quiconque contrevient à l'avis qui lui a été signifié au titre des articles 18, 25, 27, 37, 43 ou 48 ou des règlements commet une infraction et encourt, sur déclaration de culpabilité :

a) par procédure sommaire, une amende maximale de cinquante mille dollars et un emprisonnement maximal de six mois, ou l'une de ces peines; ou
b) par mise en accusation, une amende maximale de deux cents mille dollars et un emprisonnement maximal de deux ans, ou l'une de ces peines.

HEALTH OF ANIMALS ACT
DECLARATION OF AN INFECTED PLACE

LOI SUR LA SANTÉ DES ANIMAUX
DÉCLARATION DE LIEU CONTAMINÉ

Owner or occupier Propriétaire ou occupant	Location of animal(s)/thing(s) Endroit où se trouvent l'(les) animal(aux) ou la(les) chose(s)
Universal Ostrich Owner Name (legal owner of premise): Dave Bilinski Email: universalostrich@gmail.com Phone #: 778-692-9389 301 Langille Road, Edgewood, BC, V0G 1J0	301 Langille Road, Edgewood, BC, V0G 1J0 Lat: 49.862402 Long: -118.149296 Premise ID: BC44K4PMR

I have determined or suspect that the disease

J'ai constaté ou soupçonné que la maladie

Avian Influenza

exists in the place described above and pursuant to Section 22 of the Health of Animals Act, I therefore declare the place to be infected.

est présente dans le lieu décrit ci-dessus. Pour ce motif, conformément à l'article 22 de la Loi sur la santé des animaux, je déclare ce lieu contaminé.

Ian Zhang		2024-12-30
Inspector Name / Nom de l'inspecteur	Inspector (Signature) Inspecteur	Date

Identification Number Numéro d'identification	Age Âge	Sex Sexe	Description of Animal(s) or thing(s) Description de l'(des) animal(aux) ou de la(des) chose(s)
1			"All animals of susceptible species on-site (see below) and any related
2			animal products, by-products and things along with any animals,
3			products, by-products and things having contact with them".
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5			Description of susceptible species present on-site:
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7			All avian species in premise
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9			All birds/carcasses are kept indoors or in the barn. Any movement on or
10			off the above-mentioned premises will require a License for Removal of
11			Animals or Things from CFIA in order to be removed from the site.
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13			File Number: BC-820 22873
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The information on this document is collected by the Canadian Food Inspection Agency under the authority of the Health of Animals Act for the purpose of protecting human and animal health. Information may be accessible or protected as required under the provisions of the *Access to Information Act*.

Les renseignements figurant dans le présent document sont recueillis par l'Agence canadienne d'inspection des aliments en vertu de la loi sur la santé des animaux afin de protéger la santé des personnes et des animaux. Les renseignements peuvent être accessibles ou protegés selon ce que prescrit la *Loi sur l'accès à l'information*.

Sections of the Health of Animals Act:

22.(1) Where an inspector or officer suspects or determines that a disease or toxic substance exists in a place and is of the opinion that it could spread or that animals or things entering the place could become affected or contaminated by it, the inspector or officer may in writing declare that the place is infected and identify the disease or toxic substance that is believed to exist there, and such a declaration may subsequently be amended by the inspector or officer.

(2) When the declaration is delivered to that occupier or owner of the place to which it relates, the place, together with all contiguous lands, buildings and other places occupied or owned by the occupier or owner, constitutes an infected place.

23.(1) For the purpose of preventing the spread of a disease or toxic substance, an inspector or officer may in writing declare that any land, building or other place, any part of which lies within five kilometres of the limits of a place declared to be infected under section 22, is infected and identify the disease or toxic substance that could spread there.

(2) When the declaration has been delivered to the occupier or owner of any land, building or other place, mentioned in subsection(1), the land, building or other place, together with all contiguous lands, buildings and other places occupied or owned by the same occupier or owner, constitutes an infected place.

24. Where an inspector or officer cannot, after the exercise of due diligence, find the occupier or owner of any land, building or other place, delivery of a declaration may be effected by posting it on the building or on any building or conspicuous object on the land or at the place.

25.(1) Subject to any regulations made under paragraph 64(1)(k), no person shall, without a licence issued by an inspector or officer, remove from or take into an infected place any animal or thing.

Articles de la Loi sur la santé des animaux:

22.(1) L'inspecteur ou l'agent d'exécution peut par écrit, déclarer contaminé tout lieu où il soupçonne constate la présence d'une maladie ou d'une substance toxique qu'il estime susceptibles soit de se propager soit de contaminer les animaux qui s'y rendent ou les choses qui y sont apportées; il doit alors préciser la nature de la maladie ou de la substance. Il peut ensuite, de la même manière, modifier la déclaration.

(2) Sur remise de la déclaration au propriétaire ou à l'occupant, le lieu visé par celle-ci et les terrains bâtiments et autres lieux qui lui sont contigus et sont occupés par la même personne, ou dont celle-ci est propriétaire, constituent des lieux contaminés.

23.(1) Après avoir fait la déclaration prévue à l'article 22 et afin d'empêcher toute propagation, l'inspecteur ou l'agent d'exécution peut, par écrit, déclarer contaminés les terrains, bâtiments ou lieux situés - même en partie dans un rayon de cinq kilomètres du lieu visé par la déclaration originale et auxquels la maladie ou la substance toxique - dont il précise la nature - risquent de se propager.

2) Sur remise au propriétaire ou à l'occupant de la déclaration faite au titre du paragraphe (1), le lieu visé par celle-ci et les terrains, bâtiments ou autre lieux qui lui sont contigus et sont occupés par la même personne, ou dont celle-ci est propriétaire, constituent une partie du lieu contaminé.

24. L'inspecteur ou l'agent d'exécution peut, s'il n'a pu trouver le propriétaire ou l'occupant du lieu après avoir pris les mesures nécessaires en ce sens, afficher la déclaration sur un bâtiment ou un objet en vue situé sur le lieu pour valoir remise au propriétaire ou à l'occupant.

25.(1) Sauf en conformité avec les règlements d'application de l'alinéa 64(1)(k), il est interdit, sans permis signé par un inspecteur ou un agent d'exécution, de sortir tout animal ou toute chose d'un lieu contaminé ou de l'y introduire.

Canadian Food Inspection Agency | Agence canadienne d'inspection des aliments

HEALTH OF ANIMALS ACT
ATTACHMENT TO FORM

LOI SUR LA SANTÉ DES ANIMAUX
ANNEXE AU FORMULAIRE

Owner or occupier Propriétaire ou occupant	Location of animal(s)/thing(s) Endroit où se trouvent l'(les) animal(aux) ou la(les) chose(s)
Universal Ostrich Owner Name (legal owner of premise): Dave Bilinski Email: universalostrich@gmail.com Phone #: 778-692-9389 ~~301 Langille Road, Edgewood, BC, V0G 1J0~~	301 Langille Road, Edgewood, BC, V0G 1J0 Lat: 49.862402 Long: -118.149296 Premise ID: BC44K4PMR

Identification Number Numéro d'identification	Age Âge	Sex Sexe	Description of Animal(s) or thing(s) Description de l'(des) animal(aux) ou de la(des) chose(s)
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Inspector Name / Nom de l'inspecteur	Inspector (Signature) Inspecteur	Date
Ian Zhang		2024-12-30

Note: When this form is used to describe additional animals, the original of any form it is used with should have the following statement placed on it:

The description of animals/things to which this form applies is on the attached copy(ies) of form CFIA/ACIA 4209 which bear the name and date above.

Nota : Lorsque ce formulaire sert à décrire d'autres animaux, l'original de tout formulaire qui l'accompagne devrait porter la mention suivante :

La description d'animaux/de choses auxquels s'applique le présent formulaire figure sur la(les) copies annexée(s) des formulaires CFIA / ACIA 4209 qui portent le nom et la date ci-haut.

Canadian Food Inspection Agency | Agence canadienne d'inspection des aliments

LICENSE FOR REMOVAL OF ANIMALS OR THINGS

Under the authority of The Health of Animals Act

PERMIS D'ENLÈVEMENT D'ANIMAUX OU DE SUBSTANCES

En vertu de la Loi sur la santé des animaux

Name / Nom	Address / Adresse
Universal Ostrich Owner Name (legal owner of premise): Dave Bilinski Email: universalostrich@gmail.com Phone #: 778-692-9389 301 Langille Road, Edgewood, BC, V0G 1J0	301 Langille Road, Edgewood, BC, V0G 1J0 Lat: 49.862402 Long: -118.149296 Premise ID: BC44K4PMR

Is hereby permitted to Est autorisé par les présentes à	☒ Remove out of: enlever des :	301 Langille Road, Edgewood, BC, V0G 1J0 Lat: 49.862402 Long: -118.149296
	☒ Remove to: ajouter aux :	301 Langille Road, Edgewood, BC, V0G 1J0 Lat: 49.862402 Long: -118.149296

The following animals and or things: / Les animaux ou substances suivantes :

"Under the authority of the Health of Animals Act section 25. (1), no person shall, without a licence issued by an inspector or officer, remove from or take into an infected place any animal or thing.

The entry / removal of the following animals / things may occur in accordance with these conditions:

a) All family private vehicles (cars, vans, bicycles, etc) not used for animal transport following CFIA approved biocontainment procedures listed in the RDIMS 16386266 document.

b) Any outerwear that may have been exposed to, or used in respect of avains, including clothing and footwear, which has been properly cleaned and disinfected according to CFIA approved biocontainment procedures.

c) Anything can move EXCEPT those animals and things prohibited and declared infected under form CFIA/ACIA 4204, that is: all live and dead avains, avian products, avian by products and other animals and things exposed to or used in respect of avains, including but not limited to eggs, feed, manure and litter. This declaration applies to, but is not limited to the above.

d) No visitors shall be allowed access to any barn or any place where avians are confined. No visitor shall be allowed in the immediate vicinity of said barns, or said place of confinement except as authorized by an inspector of the CFIA.

e) All conditions apply until further notified by an inspector of the CFIA.

f) For anything other than those items listed above, a specific license is required to be moved off or on premises. A copy of the license must accompany shipment.

g) CFIA approved biocontainment procedures are to be followed.

File Number:BC-820 22875

Inspector Name / Nom de l'inspecteur	Inspector - Signature - Inspecteur	Date
Ian Zhang		2024-12-31

Information may be accessible or protected as required under the provisions of the *Access to Information Act*.

Les renseignements peuvent être accessibles ou protégés selon ce que prescrit la *Loi sur l'accès à l'information*.

Canadian Food Inspection Agency | Agence canadienne d'inspection des aliments

HEALTH OF ANIMALS ACT

NOTICE

REQUIREMENT TO DISPOSE OF ANIMALS OR THINGS

LOI SUR LA SANTÉ DES ANIMAUX

AVIS

ORDRE DE DISPOSITION DES ANIMAUX OU DES CHOSES

Owner or occupier Propriétaire ou occupant	Location of animal(s)/thing(s) Endroit où se trouvent l'(les) animal(aux) ou la(les) chose(s)
Universal Ostrich Owner Name (legal owner of premise): Dave Bilinski Email: universalostrich@gmail.com Phone #: 778-692-9389 301 Langille Road, Edgewood, BC, V0G 1J0	301 Langille Road, Edgewood, BC, V0G 1J0 Lat: 49.862402 Long: -118.149296 Premise ID: BC44K4PMR

I have determined or suspect that the animal(s)/thing(s) described below is (are) affected or contaminated by

Je constate ou soupçonne que les animaux ou les choses décrits(es) ci-dessous sont atteints(es) ou contaminés(es) par

Avian Influenza

and pursuant to 48.(1) of the *Health of Animals Act*, I hereby require you, the owner or person having the possession, care or control of the animal(s)/thing(s) to dispose of them during the period commencing on the date of this notice and ending on

et, en vertu du paragraphe 48.(1) de la *Loi sur la santé des animaux*, j'exige que vous, le(la) propriétaire ou la personne qui a la possession, la responsabilité ou la charge de ces animaux ou de ces choses, preniez à leur égard, d'ici le

2025-02-01 ,

and in the following manner:
Method of Destruction to be communicated by CFIA

les mesures décrites ci-dessous :

Inspector / Inspecteur	Date	Telephone / Téléphone
Ian Zhang	2024-12-31	

Identification Number Numéro d'identification	Age Âge	Sex Sexe	Description of Animal(s) or Thing(s) Description de l'(des) animal(aux) ou de la(des) chose(s)
1			All poultry and poultry carcasses along with other material
2			approved by CFIA disposal crew from the above noted poultry
3			production premises.
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11			File Number:BC-820 22874
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The information on this document is collected by the Canadian Food Inspection Agency under the authority of the Health of Animals Act for the purpose of protecting human and animal health. Information may be accessible or protected as required under the provisions of the *Access to Information Act*.

Les renseignements figurant dans le présent document sont recueillis par l'Agence canadienne d'inspection des aliments en vertu de la loi sur la santé des animaux afin de protéger la santé des personnes et des animaux. Les renseignements peuvent être accessibles ou protegés selon ce que prescrit la *Loi sur l'accès à l'information*.

Disposal

Subsection 48 (1) of the Health of Animals Act:

48.(1) The Minister may dispose of an animal or thing, or require its owner or any person having the possession, care or control of it to dispose of it, where the animal or thing

a) is, or is suspected of being, affected or contaminated by a disease or toxic substance;
b) has been in contact with or in close proximity to another animal or thing that was, or is suspected of having been, infected or contaminated by a disease or toxic substance at the time of contact or close proximity; or
c) is, or is suspected of being, a vector, the causative agent of a disease or a toxic substance.

Mesures de dispositions

Le paragraphe 48(1) de la Loi sur la santé des animaux :

48.(1) Le ministre peut prendre toute mesure de disposition, notamment de destruction, - ou ordonner à leur propriétaire, ou la personne qui en a la possession, la responsabilité ou la charge des soins, de le faire - à l'égard des animaux ou choses qui :

a) soit sont contaminés par une maladie ou une substance toxique, ou soupçonnés de l'être;
b) soit ont été en contact avec des animaux ou choses de la catégorie visée à l'alinéa a) ou se sont trouvés dans leur voisinage immédiat;
c) soit sont des substances toxiques, des vecteurs ou des agents causant des maladies, ou sont soupçonnés d'en être.

Penalty

Section 66 of the Health of Animals Act:

66. Every person who fails to comply with a notice delivered to the person under section 18, 25, 27, 37, 43 or 48 or the regulations is guilty of

a) an offence punishable on summary conviction and liable to a fine not exceeding fifty thousand dollars or to imprisonment for a term not exceeding six months, or to both; or
b) an indictable offence and liable to a fine not exceeding two hundred thousand dollars or to imprisonment for a term not exceeding two years, or to both.

Pénalité

L'article 66 de la Loi sur la santé des animaux:

66. Quiconque contrevient à l'avis qui lui a été signifié au titre des articles 18, 25, 27, 37, 43 ou 48 ou des règlements commet une infraction et encourt, sur déclaration de culpabilité :

a) par procédure sommaire, une amende maximale de cinquante mille dollars et un emprisonnement maximal de six mois, ou l'une de ces peines; ou
b) par mise en accusation, une amende maximale de deux cents mille dollars et un emprisonnement maximal de deux ans, ou l'une de ces peines.

Canadian Food Inspection Agency | Agence canadienne d'inspection des aliments

HEALTH OF ANIMALS ACT
ATTACHMENT TO FORM

LOI SUR LA SANTÉ DES ANIMAUX
ANNEXE AU FORMULAIRE

Owner or occupier Propriétaire ou occupant	Location of animal(s)/thing(s) Endroit où se trouvent l'(les) animal(aux) ou la(les) chose(s)
Universal Ostrich Owner Name (legal owner of premise): Dave Bilinski Email: universalostrich@gmail.com Phone #: 778-692-9389 301 Langille Road, Edgewood, BC, V0G 1J0	301 Langille Road, Edgewood, BC, V0G 1J0 Lat: 49.862402 Long: -118.149296 Premise ID: BC44K4PMR

Identification Number Numéro d'identification	Age Âge	Sex Sexe	Description of Animal(s) or thing(s) Description de l'(des) animal(aux) ou de la(des) chose(s)
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Inspector Name / Nom de l'inspecteur	Inspector (Signature) Inspecteur	Date
Ian Zhang		2024-12-31

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Avian influenza in birds

Avian influenza (AI), often called "bird flu," is caused by the Type "A" influenza virus. This virus can affect several species of food-producing birds (chickens, turkeys, quails, guinea fowl, etc.), as well as pet and wild birds.

Avian influenza viruses can be broadly classified into 2 types, based on the severity of the illness caused in birds:

- low pathogenic avian influenza (LPAI)
- highly pathogenic avian influenza (HPAI)

Most avian influenza viruses are low pathogenic. These typically cause little or no signs of illness in infected birds.

However, highly pathogenic viruses can cause severe illness and death in birds.

Different strains of avian influenza

Avian influenza viruses are divided by subtypes based on 2 proteins found in the viruses: hemagglutinin, or "H" protein, and neuraminidase, or "N" protein. There are 16 H types and 9 N types which create a total 144 possible combinations.

The H5 and H7 subtypes of the virus are of particular concern, given the ability of these 2 H-types to mutate from low pathogenic to highly pathogenic after they infect domestic birds. These 2 H-types have been known to cause serious disease or mortality in domestic poultry, yet low pathogenic H5 and H7 viruses are quite common in wild waterfowl.

Different strains of the same type of virus can exist, particularly in different parts of the world. Such strains can have very different characteristics and structure. For example, the H5N1 strain that has been reported in various parts of Europe is low pathogenic and is distinctly different from the Asian strain, which is highly pathogenic.

Avian influenza in humans

Avian influenza viruses, such as the highly pathogenic H5N1 virus present in Asia, can, on rare occasions, cause disease in humans.

Transmission to humans has occurred when people have had close contact with infected birds or heavily contaminated environments.

Due to the potential for human infection, it is recommended that people working with poultry suspected of being infected with avian influenza, or in contact with such poultry, wear protective clothing. This includes, face masks, goggles, gloves and boots.

Additional information:

- Avian Influenza and Poultry (Health Canada)
- Human Health Issues Related to Avian Influenza in Canada (Public Health Agency of Canada)

Where avian influenza is found

Avian influenza viruses have been found in Canada and around the world.

The Canadian Food Inspection Agency (CFIA) publishes reports on previous disease incidents in Canada.

Detailed information on the distribution of the H5N1 subtype and highly pathogenic avian influenza around the world is available from the World Organisation for Animal Health (OIE)

What the clinical signs of avian influenza are

Some or all of the following clinical signs are evident in infected birds:

- a drop in production of eggs, many of which are soft-shelled or shell-less
- diarrhea
- haemorrhages on the hock
- high and sudden mortality rate
- quietness and extreme depression
- swelling of the skin under the eyes
- wattles and combs become swollen and congested

The incubation period of AI ranges from 2 to 14 days.

The signs of AI (or more commonly known as bird flu) are very similar to those seen with Velogenic Newcastle Disease and other poultry diseases.

How to diagnose avian influenza

Avian influenza should be suspected on the basis of clinical signs.

Laboratory testing is needed to confirm the presence of the avian influenza virus. Contact your local veterinarian or provincial veterinary laboratory for assistance.

How to treat avian influenza

There is no treatment for birds that have the disease.

Vaccinating the birds may play a role in reducing the spread of the disease but does not eliminate the virus.

How avian influenza is transmitted and spread

Wild birds, especially waterfowl, are natural reservoirs of influenza viruses. They are not normally affected by the disease, but can still transmit it to domestic birds.

The disease can spread to birds through contact with infected poultry and poultry products. It can also spread through contaminated manure, litter, clothing, footwear, vehicles, equipment, feed and water.

It is essential for commercial poultry producers to use strict biosecurity practices in order to prevent introduction of the virus to their flock. Farmers should take the following measures.

- Keep poultry away from areas frequented by wild birds.
- Maintains strict control over access to poultry houses.
- Make sure that equipment is cleaned and disinfected before taking it into poultry houses.
- Do not keep bird feeders or create duck ponds close to poultry barns because they attract wild birds.
- Maintain high sanitation standards.

Avian influenza in pets

Pet birds can be infected by avian influenza and spread the disease to humans. In order to prevent the spread of AI, Canada has strict import requirements for pet birds from countries affected by avian influenza.

The highly pathogenic Asian strain of H5N1 has also been detected in mammals, including rats, mice, weasels, ferrets, pigs, cats and dogs.

However, the number of documented cases of avian influenza H5N1 in non-avian species is very low, despite the fact that this virus has caused large avian outbreaks globally over the last few years.

Current science suggests that the risk of a human contracting avian influenza from a mammalian pet is very low. Nonetheless, owners are encouraged to take appropriate precautions to protect their pets and themselves.

How to protect domestic poultry from avian influenza in Canada

The CFIA imposes strict regulations on the import of animals and animal products from countries where avian influenza is known to occur. These regulations are enforced through port-of-entry inspections done either by the Canada Border Services Agency or the CFIA.

The CFIA has enhanced its avian influenza surveillance for commercial poultry flocks in Canada with the launch of the Canadian Notifiable Avian Influenza Surveillance System (CanNAISS).

This surveillance program was developed in collaboration with provincial and territorial governments, poultry farmers and other industry representatives.

The Government of Canada, provincial and territorial governments, and animal health experts also conduct an annual surveillance program of avian influenza in wild birds. Through this program, live and dead birds are sampled and tested for avian influenza viruses.

Highly pathogenic avian influenza and low pathogenic avian influenza by subtypes H5 and H7 is a reportable disease under the *Health of Animals Act and Regulations*. This means that all suspected cases must be reported to the CFIA for immediate investigation by inspectors.

Under the Avian Influenza Hazard Specific Plan, the CFIA responds to both highly pathogenic and low pathogenic H5 and H7 viruses by reporting disease outbreaks to the OIE, establishing quarantines, ordering the humane destruction of poultry, conducting trace-out activities, overseeing the cleaning and disinfection of premises, and verifying that the affected farms remain free of avian influenza according to OIE standards.

How the CFIA responds to an outbreak of avian influenza in Canada

Canada's emergency response strategy to an outbreak of avian influenza would be to eradicate the disease and re-establish Canada's disease-free status as quickly as possible.

The CFIA's AI emergency response strategy includes the following measures:

- the humane destruction of all infected and exposed animals
- surveillance and tracing of potentially infected or exposed animals
- strict quarantine and animal movement controls to prevent disease spread
- strict decontamination of infected premises
- zoning to define infected and disease-free areas

Owners whose animals are ordered destroyed by the CFIA may be eligible for compensation.

What travellers can do to help protect Canadian livestock from an outbreak of avian influenza

While out of the country, travellers should avoid visiting areas where they may come into contact with live birds, including

- poultry farms
- live bird markets
- any other area where birds congregate

This is most important in countries that are experiencing an outbreak of highly pathogenic avian influenza.

If you are in contact with live birds infected with the AI virus, the virus may persist on your clothing, footwear and in your hair. Take appropriate personal hygiene measures, such as the following.

- Wash your hands
- Shower
- Wash all of the clothing you had with you while abroad
- Clean and disinfect your footwear

When you return home, do the following.

- Avoid contact with farmed animals (including poultry), zoo animals or wildlife for 5 days after you return if you were exposed to similar animals while you were abroad.
- Do not visit Canadian farms for 14 days if you visited a farm or had contact with wild birds while abroad.
- Be sure the footwear you wore to the farm or when you had contact with wild birds is disinfected and your clothing is washed thoroughly and dried at a high temperature.
- Complete the appropriate areas of your Customs Declaration Card - PDF (45 kb) regarding farm visits.
- Ensure all birds and poultry products you bring into Canada are eligible for entry. Declare all animal products upon arrival.

If You have Questions Please Contact cfia.ABmovecon-contdeplacements.acia@inspection.gc.ca

Avian influenza in BC for individuals in close contact with poultry

October 2024

Avian influenza and human health

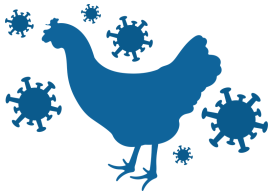
Avian influenza virus easily spreads from bird to bird. It can also infect a wide range of other wild and domestic animals such as cows, goats, skunks, and cats.

Avian influenza can also infect people. The symptoms are similar to the regular (human) flu. Infections may cause mild symptoms or severe outcomes.

When an individual is **co-infected with two influenza strains**, for example avian influenza and a human influenza virus, the strains can exchange genes. This exchange can create a new strain that could spread more easily between people and may cause a range of illness including mild symptoms or severe outcomes. This sort of scenario has caused previous human influenza pandemics. **By protecting yourself, you also protect others.**

It's important to take steps to reduce your chances of getting sick from avian influenza. **Follow these tips to keep yourself and others safe.**

You can be infected by:



- Handling sick birds or touching surfaces sick birds have been on, and then touching your eyes, nose, and mouth
- Breathing in the avian influenza virus in droplets or dust from close contact with sick birds

How to protect yourself?

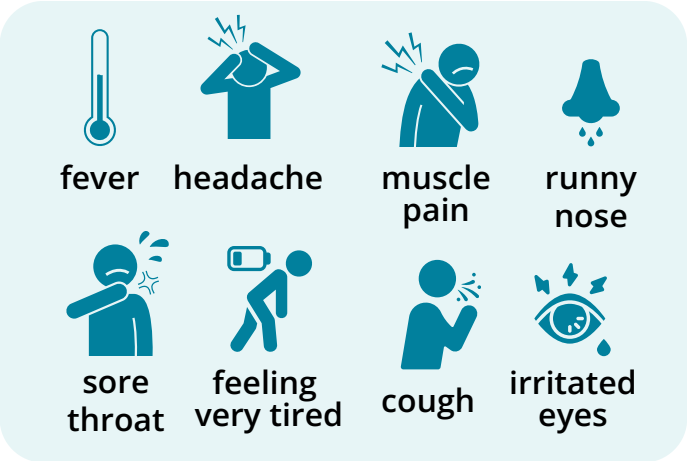
- **Limit direct contact** with sick or dead birds and their environments, and work in **well-ventilated spaces,** whenever possible
- Wear **personal protective equipment (PPE)**:
    - N95 mask and rubber or disposable gloves
    - Eye protection (e.g., goggles, face shields, safety glasses)
    - Disposable gown or coveralls and disposable protective shoe/boot covers or rubber boots
- **Do not** eat, drink, chew gum, smoke, vape, or use the bathroom when wearing PPE
- **Wash your hands** regularly with soap and water and **clean, disinfect or dispose** any potentially contaminated clothing, equipment or surfaces
- **Get the free annual flu shot**
- Follow WorkSafeBC and AgSafe guidance

If you feel sick within 10 days
after being exposed to the avian influenza virus

- **Stay home** and away from others while you have symptoms until 24 hours after your symptoms are gone. If you have to be near others, **wear a mask and wash your hands** often.

- **Tell your health care provider** that you have been in contact with animals and are concerned about avian influenza. This will help them give you appropriate advice on testing and treatment.

Symptoms include:



How local public health teams help?

- When a farm has avian influenza, local public health **checks who may have been exposed** and provides **guidance on testing and treatment** (including medicine to prevent illness)
- If you have been exposed, public health staff will ask for details about:
  - your exposure and what personal protective measures you used (like N95 masks, eye covering, hand washing, etc);
  - any pre-existing medical conditions;
  - any current flu-like symptoms and whether you had a recent flu shot

How farm owners and operators help?

- Post and share information with farm workers about protecting themselves against avian influenza
- Share contact information with public health about workers and visitors to the premises during the avian influenza event

More information:

BC Centre for Disease Control: bccdc.ca/health-info/diseases-conditions/avian-influenza

WorkSafeBC: https://www.worksafebc.com/en/health-safety/injuries-diseases/infectious-diseases/types/avian-flu

AgSafe BC: https://agsafebc.ca/download-category/avian-influenza/

TO OWNERS OF PREMISES THAT HAVE BEEN IDENTIFIED AS POSITIVE FOR AVIAN INFLUENZA

Your premises is a “Declared an infected place” 1 so that means that you are legally required to follow certain rules, outlined below, in order to help the Canadian Food Inspection Agency (CFIA) stop the spread of the avian influenza virus. A phone number is listed below for your inquiries. Your cooperation is appreciated.

The avian flu virus can survive outside of the host, and birds can get the virus from contact with other birds, or from vehicles or people travelling between farms, markets, abattoirs, and other places. The virus can also survive in organic matter (manure, mud, etc.) for a period of time. Following these guidelines will minimize the risk of spreading the virus:

 Restrict access to your premises to one entrance/exit. Provide a means to contact you at this point (i.e. cell phone number, etc.) so that you have control of people entering or leaving your premises. Access to your premises is limited to residents of the property until further notice.

 A sign will be posted in a highly visible location at the entrance to your premises in order to prevent unauthorized people from entering. Signs must remain where they were put until your property is declared free of avian influenza. If posted signs become damaged or go missing, it is your responsibility to contact the Biocontainment Unit Office.

 Park your vehicle away from the barns. Before leaving the premises, ensure your vehicle (especially tires and undercarriage) has been cleaned and afterwards, thoroughly sprayed with disinfectant. This applies every time you leave your property. Only your own vehicle is allowed to enter the premises.

 Do not remove any equipment or machinery from your premises unless you have obtained a license for removal from CFIA. All equipment or machinery leaving the premises must be fully washed and decontaminated with an approved disinfectant. *Removal of birds, bird products, manure and litter from your property, without a license, is strictly forbidden.*

 You and other people working or living on your property are not to go onto other premises where birds are kept.

 Try to establish a “dirty” and “clean” zone on your property between the barn(s) (most contaminated) and your house/office (less contaminated) in order to reduce contamination in your working/living area.

 Use disposable or clean cloth coveralls and rubber boots while working on the premises. When your work is done and you are leaving the “dirty” zone, remove the coveralls and clean and disinfect the rubber boots. Keep these items in a designated area for disposal or washing. Before leaving the premises, change into clean clothes in your “clean” zone.

 Use designated boots for each barn or a foot dip containing disinfectants when you need to pass between the barn(s) (dirty) and the house/office (clean) areas. Please use the foot dip each time you exit the premises. Disinfectant in the foot dip must be changed every 2 3 days.

 Put an effective rodent control program in place.

 Bird proof your barn/poultry house. Ensure that wild migrating birds cannot be contaminating your poultry pens, feed, and poultry drinking water.

1 : A “Declared an Infected Place” means that your premises and animals are under quarantine

LETTER OF DIRECTION

COMPENSATION FOR DESTRUCTION AND DISPOSAL OF ANIMALS/THINGS

I, _____
(Legal Name)

Of _____
(Civic Address)

_____ _____ _____
(City) (Province) (Postal Code)

Owner of _____
(Farm Name)

hereby direct and authorize the Canadian Food Inspection Agency (CFIA), to pay directly to service providers for the cost of disposal and destruction of animals and/or things as well as appropriate taxes (if applicable), ordered disposed of as per Notice of Requirement to Dispose/Destroy animals delivered by CFIA, pursuant to section 51(4) of the *Health of Animals Act*, as a result of costs incurred with respect to disposal required under subsection 48(1).

_____ _____
Name and signature of Owner of Animal(s) Date

_____ _____
Name and signature of Witness[1] Date

[1] The witness could be a family member, business partner or neighbor willingly signing the template.

Joint message from BC Offices of the Provincial Health Officer and Chief Veterinarian:
Detection of important mutation in avian influenza A(H5N1) viruses affecting some poultry premises in BC

December 10, 2024

Summary

In the past month, about ten of the poultry premises in the Fraser Valley of British Columbia (BC) infected with avian influenza A(H5N1) viruses have an important viral change (mutation) in their genetic code.

The mutation is called "H275Y". This mutation is known to reduce how well the drug oseltamivir (also known as Tamiflu) works against avian influenza viruses. Oseltamivir is the main anti-viral medication we use to treat and prevent influenza infections in people. This mutation is not expected to directly increase the risk of acquiring or transmitting the virus.

Although it has been found before in human and animal influenza viruses, the H275Y mutation is currently rare. It is very important we take steps to prevent viruses with the mutation from spreading to more farms or to people because it could seriously limit our ability to use oseltamivir to treat human influenza cases.

This is what we are doing in response:

- We are monitoring avian influenza infections and working with partners to prevent spread.
- The CFIA, with the support of the poultry industry and other partners, continues to take measures to remove infected flocks quickly and apply measures to prevent spread between farms.
- Public and animal health agencies in BC, together with the CFIA, are determining the genetic code (sequencing) of avian influenza viruses in poultry and wild birds to learn as much as we can about the virus, how it is spreading, and the risk to animals and humans.
- At the moment, we have not seen spread from birds to people at these farms or seen human H5N1 cases with this mutation but will continue to monitor closely.
- We are sharing this information for awareness as it is yet another reason to consistently use the strongest possible biosecurity and personal protective measures to prevent spread of avian influenza.

This is what we are asking you to do in response:

- **Limit direct contact** with sick or dead birds, their droppings and their environments, and work in **well-ventilated spaces,** whenever possible.
- Follow WorkSafeBC and AgSafe guidance when in a potentially infected environment or handling potentially infected animals or their droppings, including **personal protective equipment (PPE**) such as:
    - N95 respirator and rubber or disposable gloves.
    - Eye protection (e.g., goggles, face shields, safety glasses).
    - Disposable gown or coveralls and disposable protective shoe/boot covers or rubber boots.
- **Do not** eat, drink, chew gum, smoke, vape, or use the bathroom when wearing PPE.
- **Wash your hands** regularly with soap and water and **clean, disinfect or dispose** any potentially contaminated clothing, equipment, or surfaces.

- If you feel sick within 10 days after being exposed to sick or dead animals such as with irritated or red eyes, fever, headache, sore throat, runny nose cough, muscle pain or feeling very tired:
    - **Stay home** and away from others while you have symptoms until 24 hours after your symptoms are gone. If you have to be near others, **wear a mask and wash your hands** often.

    - **Tell your health care provider** that you have been in contact with sick or dead animals and are concerned about avian influenza. This will help them take appropriate precautions and give you appropriate advice on testing and treatment.
- Please get your annual flu shot. This will help prevent you from being co-infected with human and avian influenza viruses at the same time. Preventing co-infections helps prevent avian and human influenza viruses from sharing their genetic codes. This helps reduce the chances of avian influenza viruses adapting to humans.

Theresa Burns, Chief Veterinarian
Ministry of Agriculture and Food

Bonnie Henry, OBC, MD, MPH, FRCPC
Provincial Health Officer

Resources:

BC Ministry of Agriculture: https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/animals-and-crops/animal-health/reportable-notifiable-diseases/avian-influenza-ai

BC Centre for Disease Control: bccdc.ca/health-info/diseases-conditions/avian-influenza

WorkSafeBC: https://www.worksafebc.com/en/health-safety/injuries-diseases/infectious-diseases/types/avian-flu

AgSafe BC: https://agsafebc.ca/download-category/avian-influenza/

Privacy Notice Statement for Animal Disease Investigations

The Canadian Food Inspection Agency (CFIA) is committed to protecting the privacy rights of individuals, including safeguarding the confidentiality of information provided by individuals and institutions.

This information is being collected and used under this Agency's legislative authority for the following purpose: to support the eradication and/or control of livestock diseases in Canada which are reportable in accordance with the *Health of Animals Act*. This information will be retained in accordance with the Agency's retention and disposition policies.

The personal information collected appears in Personal Information Bank Monitoring and Enforcement for the Canadian Food Inspection Agency, which is described within InfoSource.

Personal information collected by CFIA and the Government of Canada is protected from disclosure to unauthorized persons and/or agencies pursuant to the provisions of the Privacy Act. Individuals to whom the personal information pertains have the right to the protection of and access to their personal information under the *Privacy Act*, subject to certain exceptions and exemptions.

For inquiries, concerning the treatment of personal information in the custody of CFIA, individuals may contact the Canadian Food Inspection Agency's Access to Information and Privacy Office at cfia.atip-aiprp.acia@canada.ca or located at 1400 Merivale Road, Tower 1, Room 0-149 Ottawa, ON K1A 0Y9, Canada, for access to their personal information pursuant to the provisions of the *Privacy and Access to Information Acts*.

Owner or person having the care of the animals /things Information Sheet

☐Requirement to Quarantine

If animals are suspected of being infected with a contagious Reportable animal disease, a CFIA staff member (usually the district veterinarian) will visit the premises to meet with you. At that time, the animals and things present on your premises will be "quarantined" and precautionary movement restrictions will be put in place. The CFIA employee will provide you with documentation outlining the rules of the “Requirement to quarantine” and discuss your responsibilities. He or she will also answer any questions you may have.

Movement restrictions are necessary to control the potential spread of the disease. Some diseases are highly contagious and can spread rapidly through close contact between animals, as well as on contaminated equipment, clothing and footwear, on contaminated material such as hay and feed, or deadstock that could be accessed by susceptible animals. In addition, some diseases can spread by the air (virus excreted in the breath of an infected animal then carried through the air to other livestock).

During the quarantine period, you are not authorized to:

- remove animals or things (e.g. animal products and by-products, feed, manure, hay, straw, vehicles and equipment) from the place of quarantine;
- let the animals or things (e.g. animal products and by-products, feed, manure, hay, straw, vehicles and equipment) come into contact with an animal that is not quarantined under the same quarantine order;
- destroy the animal or thing;
- treat or test the animal or thing for a communicable disease;
- do the following, unless you have obtained prior authorization of a CFIA inspector:
    - Move a thing or alter its appearance, remove any tag, sign or notice indicating that the thing is under quarantine.
- transport or cause to be transported an animal or thing under quarantine unless a license for its transport has been issued by an inspector and a copy of the license has been provided to the transporter.

During the quarantine period, you must:

- Maintain signage indicating that the animals /things are under “Quarantine”;
- Notify, without delay, a veterinary inspector of any quarantined animal that appears sick;
- If authorized, transport animals / things directly to location stated in the license.

What to expect – Steps on how CFIA will work through process on your farm.

*Note that this is a fluid process and some of these items may overlap.

1. **Case officer** discussion - explanation of the process. The **Case Officer is your dedicated connection into the various CFIA teams** that are responding to the positive test result. There is a chance that your case officer may change throughout the response, but every effort will be made to ensure a smooth transition. The case officer will provide you with 3 official documents.
    - **Order to dispose** (Form #4202)- This is the order stating that CFIA has confirmation that your flock is infected with Avian Influenza, and this is an order to depopulate and dispose of all material. This may include birds, eggs, feed, bedding, manure, etc..
    - **Declaration of Infected Place** (From #4204)- this states that Avian Influenza has been detected, and declaring that your premises is infected, and subject to the appropriate control mechanisms that will be placed to control the disease
    - **Movement Controls** **(Form #4206Q- –**Quarantine) - this provides instruction that any material related to poultry cannot be brought on or off the farm. If there are welfare concerns (i.e., a feed delivery is scheduled for the next day), we can permit movement and assist with cleaning the truck before it leaves the premises (Form #1509 and Specific Movement permits).
        - Note: This may have been applied based on suspicion of disease, before this process started.

2. **Premises investigation questionnaire** – This is a **fairly long interview** that will be scheduled with you and our **Field Epidemiology** team. Your **case officer** will usually also be present. The purpose of this is for our team to try to understand how the virus may have entered your facility, and to see if there are risks that it may have spread to other locations. They will ask you for quite a bit of information, so it may be beneficial to have things like your production records and delivery schedules available. It is also beneficial to have access to video conferencing either with smart phone or laptop

3. **Biocontainment site assessment** - Our Biocon team is typically the first group that you will see come out to the farm. They will be setting up what we call "Hot", "warm", and "cold" zones. These zones are related to the risk of the virus being present. The Hot zone will encompass the barns and poultry related areas. The Warm zone will be a transition area for our staff to move in and out through. The Cold zone will be the rest of the premises, where there is minimal risk of moving the virus by moving within this zone. They will map your premises to guide the future actions of our teams that will be coming to the site.

4. **Depopulation** - This will be the busiest day on your premises. Depending on the size of the farm, there will typically be anywhere from 5-20 CFIA staff coming out to your premises. Either your Case officer, or a site manager will also be there. This will be your contact

throughout the day's activities. If you have any questions or concerns, they should be raised to this person. They will introduce themselves to you, so you know who they are.

- What the day looks like
  - A Porta-Potty and a dumpster will be delivered to the site, typically in the morning of. CFIA will provide them with directions as to where these should be placed. (This is determined during the biocontainment site assessment)
  - **Site Manager/Case officer** arrival, usually at the same time as the biocontainment team
  - Biocontainment team will usually be the first team on the premises. They will set up the zones described above and they are there to ensure we do not carry the virus out of the barns. They will support our teams moving in and out of the barns to ensure that the virus does not leave the hot zone.
  - Depopulation team will be there at the same time, or a bit after the Biocon team. They are the group responsible for the euthanasia of the birds. There are various options for this, and the depopulation method will be discussed with you through the case officer, prior to this date. For large barns, this is typically done with CO_2 gas.
  - Depending on the method used, the teams may request your assistance to lift feed and water lines, and assist with turning off fans at the appropriate times. **You will be provided with PPE from our team for this activity.**
  - The teams will be using full personal protective equipment for a couple of reasons.
    - To ensure they do not carry the virus off of the premises
    - For their personal protection - Avian Influenza can be contracted by humans **(please consult public health, or your doctor if you have any flu like symptoms)**.
  - If CO_2 is used, the team will let the barns sit with the gas inside the barns for a period of time. After this, they will go back to the barns to vent them, and allow the gas to disperse. **It is not safe to enter the barns during this time.**
  - Once CFIA has verified that the birds on the premises have been euthanized, they will work to take down the equipment we have placed and to get all people and items out of the area.
  - **The site manager/case officer will continue being in contact with you, and they will provide information and answer any questions before leaving the site.**

5. **Disposal** - Our Disposal team is responsible for ensuring that material that may be contaminated with the virus is all disposed of in an appropriate method. There are various methods that can be utilized, and this decision will be made in discussion with the **case officer and the disposal lead**. **Ultimately it is up to you, as the producer, to come up with a plan for this step,** but our CFIA staff are able to assist in this process. If you already have a disposal plan in place, our disposal team can review and approve or provide comments. Some of the disposal options include: composting, burial, incineration, bio digestion and above ground burial (just to name a few). If you prefer - CFIA can take over and control this step. For this to happen, we will ask you to sign a form that authorizes us to undertake this task on your

behalf. This form is known as a letter of Direction. Regardless of the approach, our disposal team will be involved in overseeing and verifying disposal activities. Any disposal activities need to be approved by CFIA prior to occurring, so please start working with your case officer on this as soon as possible.

6. **Cleaning and disinfection (C&D)**- This is the final step in on-farm activities. The disposal step removed the infected Material. The cleaning and disinfection is the step to go through and ensure the barns and poultry production areas are now free of the virus. Again, there are various ways that this can be completed, and this will be discussed with the **case officer and the cleaning and disinfection lead**. **Again, it is up to you to present a plan for this step**, and CFIA is able to assist and provide guidance. There are milestones in this step:
    - **Primary Decontamination** - this is a basic step that includes ensuring that all material that may have been missed in disposal is removed (i.e., Feathers, minor bits of manure on floors/walls etc.)
    - **Cleaning** - This is the wet clean - hosing out the barns, making sure no organic material is present
    - **Disinfection** - this is application of an approved disinfectant that is used to kill the virus that may be present on remaining cleaned surfaces.
    - CFIA will visit to verify each of these steps individually. **Please do not move from one step to the next without talking to CFIA, as there may be a risk of having to repeat steps.** Once CFIA has signed off on the final disinfection step, your farm will enter what is called a **14-day vacant period**. You are allowed to place chicks in this period, however, if you do, they will be subject to 2 weeks of enhanced surveillance. At the end of this vacant period, CFIA will revoke the Declaration of Infected premises and the movement controls that were placed at the beginning.
        - Note: There may still be a **Primary Control Zone** around your premises that would still subject you to lesser controls. These should be discussed with your industry rep, or the case officer.

7. **Compensation**
    - Within the first week of this process, you will likely receive information from our Compensation team walking you through the process. **Note that this is going to be heavy on information, and there will be a large number of various documents requested so that we can ensure that you are compensated as fairly as possible.**
    - Important Notes:
        - You are **only eligible for compensation for birds that are lost or euthanized AFTER** CFIA has issued you an order to dispose.
        - You will **only be eligible for compensation for items listed in the disposal plan**. This is the importance of a disposal plan being approved prior to your taking action on it. Once CFIA has approved the plan, that is also an agreement that you are entitled to compensation for the costs associated with the implementation of the plan, as well as for the things that will be disposed of as a result of that plan.
        - You will be compensated for the value of the birds on the date that the order to dispose is issued.

- Compensation is **not available for the cleaning and disinfection costs**. There may be options for insurance, or provincial programs to support this, but CFIA is unable to compensate for this.
    - In the event you do not wish to complete cleaning and disinfection, a 120-day **Fallow period** is an option. In this situation, the declaration of infected premises and the movement controls will remain in place for 120 days after primary decontamination. During this time, you are not allowed to place birds, or disrupt the area that is subject to the fallow. You will also be contacted or visited approximately once a month until this is completed for CFIA to verify that the fallow is being maintained.
- Your **key contact through this process will be a member of the compensation team**. Your case officer can still be involved, but as this is a bit more involved process, direct communication with the compensation team is important.

Version of Record: https://www.sciencedirect.com/science/article/pii/S016758772100218X
Manuscript_e1dc5fb541528383107b7b1c9edd90d2

Title

The spatiotemporal epidemiology of high pathogenicity avian influenza outbreaks in key ostrich producing areas of South Africa

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Abstract

High pathogenicity avian influenza (HPAI) has become a major focus point worldwide due to its zoonotic potential and economic effects resulting from trade restrictions and high mortality rates in poultry. Key ostrich producing provinces of South Africa have experienced three H5N2 HPAI outbreaks (2004, 2006 and 2011) and one H5N8 HPAI (2017) outbreak over the past two decades.

The Klein Karoo region in the Western Cape Province, a province with a largely Mediterranean climate, is the predominant ostrich producing region in the country. Understanding the epidemiology of HPAI in ostrich producing areas is an essential first step in developing effective and efficient control measures. This study investigated the spatiotemporal patterns associated with the 2011 (H5N2) and 2017 (H5N8) HPAI outbreaks in the key ostrich producing areas of South Africa. Six hundred and nine and 340 active ostrich farms/holdings were subjected to surveillance during 2011 and 2017 respectively, with over 70% of these farms located within five local municipalities of the study area. Forty-two and fifty-one farms were affected in the 2011 and 2017 outbreaks respectively. Both HPAI outbreaks occurred predominantly in areas of high ostrich farm density. However, the temporal occurrence, spatial and directional distributions of the outbreaks were different. The 2011 outbreak occurred earlier in the South African autumn months with a predominantly contiguous and stationary distribution, whilst the 2017 outbreak onset was during the winter with a more expansive multidirectional spatial distribution. Results suggest potential dissimilarities in the important risk factors for introduction and possible mode of spread. The

2011 outbreak pattern resembled an outbreak characterised by point introductions with the risk of introduction possibly being linked to high ostrich farm density and common management and husbandry practices in the ostrich industry. In contrast, the 2017 outbreak appeared to have a more propagating mode of transmission. The findings highlight epidemiological features of HPAI outbreak occurrence within ostrich populations that could be used to inform surveillance and control measures including targeted surveillance within high-risk spatial clusters. The study emphasizes the importance of both; implementation of a multi-pronged approach to HPAI control and the need for constant evaluation of the interaction of the host, environment and agent with each outbreak, in order to strengthen disease control.

Keywords: spatial epidemiology, directional distribution, temporal occurrence, cluster analysis, HPAI

1. Introduction

Avian influenza (AI) viruses (AIV) are Influenza Type A viruses belonging to the Orthomyxoviridae family and can cause a highly contagious disease of domestic poultry, many species of wild birds and some mammals (Alexander, 2007). The AIVs are classified based on serotypes and expected pathogenicity in chickens: high pathogenicity avian influenza (HPAI) viruses and low pathogenicity avian influenza (LPAI) viruses. Infected birds shed the virus in faecal and oro-nasal discharges and the main routes of virus transmission are faecal-oral and inhalation of infectious droplets or aerosols (Webster et al., 1992). The primary source of infection of AIV for domestic poultry is considered to be either direct or indirect contact with wild waterfowl, with secondary transmission occurring as a

result of either direct or indirect contact mainly attributed to human activities (Stallknecht and Shane, 1988; Alexander, 2007).

Ostriches are susceptible to AIV infections and several isolates have been identified from naturally infected birds (Clavijo et al., 2001; Abolnik et al., 2012; Abolnik et al., 2016). Clinical signs of HPAI in ostriches during an outbreak include anorexia, depression, central nervous system and enteric signs (Capua et al., 2000). Adult ostriches infected with HPAI viruses typically have few and mild clinical signs (Clavijo et al., 2001), but young ostriches can develop secondary complications and present with enlarged spleens, swollen livers and generalized congestion on post-mortem examination (Abolnik et al., 2012; Howerth et al., 2012). Immune status, management, and malnutrition can all influence the severity of clinical signs and presence of post-mortem lesions (Abolnik et al., 2016).

A combination of serological tests, direct antigen detection and virus isolation can be used to identify AIV in infected flocks of birds (Swayne and Suarez, 2000). The enzyme-linked immunosorbent assay (ELISA) and hemagglutination inhibition (HI) tests are used for routine AI surveillance in ostriches in South Africa (DAFF, 2012b). Reverse transcriptase polymerase chain reaction (RT-PCR) and more traditional methods of virus isolation and characterisation are used for direct detection and confirmation of infection.

The first report of natural HPAI infection in ostriches was within an Italian flock during an H7N1 HPAI outbreak (Capua et al., 2000). Outbreaks of HPAI in South African ostriches have been documented since 2004 when an H5N2 HPAI virus was detected on a farm in the Eastern Cape Province (Sinclair et al., 2006). The subsequent outbreaks of H5N2 HPAI in 2006 and 2011 within the Western Cape Province only affected ostriches and were unrelated to the 2004 occurrence (Abolnik et al., 2016). Wild migratory birds were implicated in the introduction of this virus into the ostrich population (Abolnik et al., 2012; Abolnik et al.,

2016). The 2011 HPAI outbreak likely had a wild duck origin and was derived from Eurasian strains of LPAI (Abolnik et al., 2012), whilst the H5N8 HPAI outbreak that affected South African ostriches in 2017 was part of the widespread multinational outbreak caused by virus derived from the Goose/ Guangdong lineage affecting various poultry species and wild birds. (Khomenko et al., 2018). Factors that were epidemiologically linked with H5 AI sero-positivity in South African ostriches during 2005 included high on-farm ostrich density, failure to disinfect equipment and increased frequency of contact with specific wild bird species (Thompson et al., 2008).

South Africa does not allow vaccination of ostriches against AI (Sinclair et al., 2006). Control measures include quarantine, movement restrictions, depopulation of infected farms and increased surveillance within control areas (DAFF, 2012b). Culling of entire ostrich flocks on affected farms was implemented following an initial positive or suspect diagnosis during the 2011 outbreak. A modified stamping out process that included slaughter at abattoirs following consecutive negative PCR results 21 days apart was implemented for the 2017 H5N8 HPAI outbreak.

HPAI outbreaks have negatively impacted the ostrich rearing industry in South Africa due to export suspension and restrictions to an industry that accounts for approximately 70% of the world's ostrich products (Duminy, 2016). The 2011 H5N2 HPAI outbreak caused a loss of approximately 10% of the country's total domestic ostrich population and 53 million Rands (approximately USD 7.4 million) in total owner compensation (van Helden et al., 2016). The 2017 outbreak was the first documented to also affect gallinaceous poultry species in South Africa (Abolnik et al., 2019). There is an increased zoonotic potential of AIV following replication in ostriches, due to the potential of the virus to select for mammalian-adapted PB2 mutations when it replicates in ostriches and other ratites (Shinya et al., 2009; Long et al., 2016). This fact highlights the importance of AI control in ostrich populations.

The aim of this study was to investigate the spatiotemporal patterns associated with the 2011 and 2017 HPAI outbreaks in the key ostrich producing areas of South Africa in an effort to inform a risk-based surveillance program.

2. Materials and methods

2.1. Study Area

The study protocol was reviewed and approved by the University of Pretoria, Faculty of Veterinary Science Research Ethics Committee (REC103-19) and the Department of Agriculture, Forestry and Fisheries of South Africa (DAFF) (approval 1194). The study area was the Western Cape Province, which is the key ostrich producing province of South Africa. This province is situated along the southwestern coast of the country and consists of 24 local municipalities as well as one metropolitan municipality (Figure 1). The Western Cape Province contained 77% of the registered export ostrich farm population in the country in 2011 and this increased slightly to 80% in 2016 (DAFF, 2012a; DAFF, 2017). This province was affected by both the H5N2 and H5N8 outbreaks that occurred in 2011 and 2017 respectively.

AI surveillance in ostriches within South Africa

Routine surveillance of all commercial ostrich operations includes biannual serological AI testing. Additionally, pre-movement serological testing is performed on the farm of origin. Post-movement testing is performed on the relocated flock at the farm of destination 28-60 days post movement (DAFF, 2012b). The ELISA was used as an initial screening test and positive samples were further analysed using HI for AI subtype determination. One or more samples with an HI test antibody titer of 1:4 or greater using two different H antigens was used to classify a serologically positive farm (DAFF, 2012b).

Seropositive ostrich farms were quarantined and additional samples were collected for serology and RT-PCR testing of tracheal swabs as part of the outbreak investigation. Farms within a 10 kilometer radius of HPAI infected farms or 3 kilometers of LPAI infected farms were also tested as part of intensified sampling and outbreak investigation. All serological sampling done for AI on ostrich farms was designed to detect the presence of ostrich exposure to H5 or H7 AI subtypes at a minimum 10% prevalence with 95% confidence in every epidemiological group of ostriches. Sample size for RT-PCR testing during intensified sampling was calculated to detect a minimum prevalence of 5% at a 95% confidence level (DAFF, 2012b).

Routine surveillance for the purpose of this study included serological biannual AI testing, pre movement as well as post movement testing. Intensified sampling of ostriches on seropositive ostrich compartments and testing of farms within a 10 km radius of HPAI infected farms or 3 km of LPAI infected farms was classified as intensified surveillance.

2.2.Study design

HPAI H5 outbreak data were obtained from the Western Cape Department of Agriculture Veterinary Services for the years 2011 and 2017-2018. The period of study was from January 2011-December 2011 and January 2017-December 2018. The population at risk included all ostrich farms/holdings that were visited for surveillance purposes during the study period and had recorded census information.

Data were extracted from AI surveillance records and completed disease outbreak (SR1) reports held by the Western Cape Department of Agriculture for the periods 1 January 2011-31 December 2011 and 1 January 2017-31 December 2018. Extracted data included farm

name, location, date of visit, ostrich census on the day of the farm visit, purpose of visit, tests performed and test results.

Farms with missing information for the ostrich census information were excluded from analysis and farms with no coordinates recorded were assigned the centroid coordinates of the respective local municipality. Farms with no positive ELISA and HI AI reactions on laboratory testing were classified as negative. The date samples were collected from the farm for testing was considered the date of disease occurrence. The purpose of testing each farm (routine surveillance versus intensified active surveillance) was also extracted from available records.

Two case definitions were used to account for the limitations of positive serology in absence of subsequent virus detection. A suspect case was defined as any farm from which positive H5 (2011 outbreak) serology results were obtained with the HI test or with positive reactions to at least two H5Nx and two HxN8 antigens used in the HI tests (2017 outbreak). An HPAI confirmed case in 2011 was any farm that tested RT-PCR positive to H5 using the influenza VLA Influenza H5/H7 kit (Applied Biosystems) (Abolnik et al., 2012) or if H5N2 HPAI virus was isolated. An HPAI confirmed case during the 2017 outbreak was a positive H5 RT-PCR result confirmed by the Agricultural Research Council–Onderstepoort Veterinary Research laboratory (Abolnik et al., 2019) or where HPAI H5N8 virus was isolated. For the purposes of describing the results within this manuscript, an “outbreak” was considered to include all suspect and confirmed HPAI cases recorded during each study period.

Confirmed cases during the 2011 outbreak were classified as two broad epidemiological groups (A and B) based on the phylogenetic comparison of genome segments (Abolnik et al, 2012).

2.3.Data analysis

Spatiotemporal data analysis was based on farm infection status and not within farm prevalence as extracted data could not be used to accurately estimate farm-level prevalence. Separate analyses were performed for the independent 2011 and 2017 outbreaks.

2.3.1. Descriptive statistics

The number of suspect and confirmed cases reported each month were presented as epidemic curves. The confirmed cases during each month were further classified into epidemiological group A, B or undetermined for the 2011 outbreak. Choropleth maps were created to describe the spatial distribution of ostrich farms as well as suspect and confirmed cases at the local municipality level. Kernel density estimation (KDE) was used to produce a smoothed map of farm numbers per 10 km². Analyses were performed using ArcGIS software (v 10.6.1, ESRI, Redland USA) with shape files obtained from the Municipal Demarcation Board (http://www.demarcation.org.za/site/?lsvrdocumentcat=geospatial-datasets). The number of farms available for study varied for 2011 and 2017 (Table 1).

2.3.2. Spatial and spatiotemporal analysis

Cuzick-Edwards nearest neighbor method was used as a test for global spatial clustering of the combined suspect and confirmed cases at the level of the first nearest neighbor. The first nearest neighbor was identified using R software (R Core team., R 3.6.2, Vienna, Austria) with functions in the Spdep package and the test statistic was calculated in Excel (Microsoft, v 16.0, Washington, USA) using an established formula (Cuzick and Edwards, 1990). Values of the observed case pairs, expected case pairs, Z statistic and P-values were recorded for each outbreak and significance was set as $P < 0.05$.

SaTScan software v 9.6 (SaTScan, 2018) was used to determine local spatial and space–time clustering. Low-risk and high-risk cluster analyses were performed assuming a Bernoulli model (Kulldorff, 1997). This procedure places circular scanning windows on all case (HPAI affected) and control (HPAI unaffected) locations included in the study and for each location the null hypothesis assumes that the prevalence of infection is the same within and outside the window (Kulldorff, 1997). The maximum spatial size of the scan window was set to 25% of the total population at risk with a 3-month maximum temporal window. The significance of the detected clusters was evaluated using 999 Monte Carlo simulations. Clusters with P-values less than 0.05 were considered significant. Analyses were performed using all cases, only confirmed cases and cases detected by routine surveillance (i.e. not as a result of intensified outbreak response surveillance). Identified clusters were reported with the respective P-values, radius, observed number of cases and prevalence ratio.

2.3.3. Directional analysis

Standard deviational ellipse (SDE) in ArcGIS 10.6.1 was performed to depict outbreak progression. For the SDE analysis, outbreak periods were divided into seasonal quarters from the onset of the outbreak and each case was allocated to these quarters based on its temporal occurrence. The analysis was done for combined suspect and confirmed cases and separately for confirmed cases only. Seasonal quarters were defined as: March–May (autumn), June-August (winter), September-November (spring) and December–February (summer). The SDE analysis was also performed for the two epidemiological groups (A&B) identified during the 2011 outbreak.

3. Results

3.1.Temporal and spatial progression

There were 609 and 340 farms/holdings visited for surveillance purposes during 2011 and 2017 respectively (Table 1). During 2011, 20 municipalities in the Western Cape Province

had active ostrich farms/holdings. The highest number was in the Oudtshoorn Local Municipality (n=190), which held 31.2% of the total ostrich farm population in the province. The Hessequa Local Municipality had 106 farms whilst Kannaland and George held 89 and 77 respectively. The least number of farms were recorded in the Breede Valley, Cederberg and Stellenbosch local municipalities. Sixteen local municipalities had active ostrich farms/holdings during the 2017/2018 period. The Oudtshoorn Local Municipality had the highest number (n=140), whilst Kannaland and Hessequa local municipalities had 59 and 55 farms respectively. There were also a substantial number of farms located in the Mossel Bay (n=30) and George (n=25) local municipalities. All other local municipalities combined only contributed 9.1% to the provincial ostrich farm count.

Forty-two farms were affected during the 2011 HPAI (H5N2) outbreak with a total of 43 cases recorded (Table 1). In 2017/2018, the H5N8 HPAI outbreak affected 51 farms with 51 total cases (Table 1). Ten farms were affected during both outbreaks and these farms were located in the Oudtshoorn and Hessequa municipalities. During both outbreaks, the greatest number of cases occurred in Oudtshoorn Local Municipality (41 farms affected; 2011=35 cases, 2017=14 cases), which also had the highest ostrich farm density. The 2011 H5N2 outbreak occurred in two distinct peaks, the first from March to May and the second one between June and September (Figure 2A). The epidemic curve for the 2017 HPAI outbreak was characterised by one distinct peak of cases at the onset of the outbreak followed by a sustained low prevalence of suspect cases throughout the remainder of the study period (Figure 2B).

All cases during the 2011 HPAI outbreak were located in five municipalities whilst nine municipalities within the province were affected by the 2017 HPAI outbreak (supplementary figures S1 and S2). Nine and thirty-four cases were detected through routine surveillance

during the 2011 and 2017 outbreaks respectively. Other affected farms were detected through intensified surveillance as a response to either LPAI or HPAI cases. Prevalence of affected farms in the municipalities ranged from 2.2% (2 out of 89 farms affected) in Kannaland to 0.9% (1 out of 106 farms affected) in Hessequa during 2011. Municipalities in the west and north-western parts of the province had higher prevalence during the 2017 outbreak, up to 33% in Swellendam Local Municipality (2 out of 6 farms affected); unlike the municipalities in the south-eastern parts of the province, where George Local Municipality had the lowest prevalence at 4% (one out of 25 farms affected). The average distance between cases during the 2011 and 2017 outbreaks were 7.6 km and 13 km respectively. The distance between the index and the furthest case during the 2011 and 2017 outbreaks was 144 km and 269 km respectively (Table 1).

3.2.Global clustering

There was significant global clustering of cases during both outbreaks. The 2011 outbreak had 13 observed case pairs compared to the expected three pairs and a Z statistic of 6.12 ($P < 0.001$). The 2017 outbreak had 13 case pairs with 7.5 expected pairs and a Z statistic of 2.20 ($P = 0.028$).

3.3.Local clustering

3.3.1. Purely spatial clusters

A single spatial cluster was identified for the 2011 outbreak in the Oudtshoorn Local Municipality. There was a single significant cluster for the 2017 outbreak that was much larger and excluded the Oudtshoorn Local Municipality (Figure 3). There were no significant spatial clusters for the 2011 outbreak after excluding cases identified through intensified surveillance. However, a significant spatial cluster remained for the 2017 outbreak. The

analysis also identified a statistically significant large, low-rate cluster that covered the greater part of the Western Cape Province for the 2011 outbreak (Figure 3A). The low-rate spatial cluster had a statistically significant lower prevalence ratio, i.e. the ratio of case prevalence within the cluster compared to the expected prevalence. A low-rate spatial cluster was also identified in the Mossel Bay and parts of the Oudtshoorn local municipalities during the 2017 outbreak (Figure 3B). No significant low-rate clusters were identified for either outbreak after excluding cases identified through intensified surveillance. Significant spatial clusters were identified in similar locations when only confirmed cases were analysed (supplementary figures S3 and S4).

3.3.2. Spatiotemporal clusters

One statistically significant space-time cluster was detected for the 2011 outbreak. The cluster occurred between 1 March and 30 April within the Oudtshoorn Local Municipality (Figure 3A). When focusing on cases detected via routine surveillance in 2011, one significant spatiotemporal cluster (14.4 km) was identified in the Oudtshoorn Local Municipality for the period 1 March 2011 to 31 March 2011 (Figure 3A). Two statistically significant space-time clusters were detected for the 2017 outbreak. The clusters occurred from 1 to 31 August (primary cluster) and 1-30 September (secondary cluster) within the Hessequa and the Oudtshoorn municipalities respectively (Figure 3B). The primary spatial cluster is the significant spatial cluster with the highest prevalence ratio, i.e. the ratio of case prevalence within the cluster compared to the expected prevalence. The secondary cluster also has a significant p value but a lower prevalence ratio compared to the primary cluster. There were no significant spatiotemporal clusters for the 2017 outbreak after excluding cases detected through intensified surveillance.

3.4.Directional analysis

The 2011 and 2017 outbreaks had varying degrees of southwest to northeast orientation during the winter and spring seasons (Figures 4 and 5 respectively). The first cases during the 2011 and 2017 outbreaks were recorded in autumn and winter respectively. Autumn had the smallest spatial extent for the 2011 outbreak. Summer had the largest spatial extent for the 2017 outbreak; it was the only season during which the orientation of the ellipse was southeast to northwest. There were few cases during this season for 2011. During the 2011 outbreak, epidemiological group B had a larger spatial extent with a defined southwest to northeast orientation compared to A, which had an east to west orientation (Figure 6).

4. Discussion

The study examined the spatiotemporal patterns of the 2011 H5N2 and 2017 H5N8 HPAI outbreaks in ostriches of South Africa. The 2011 and 2017 HPAI outbreaks were initially detected in ostriches within the Oudtshoorn and Hessequa local municipalities respectively. The two outbreaks had different spatial patterns despite the overall distribution of ostrich farms being similar. The 2011 H5N2 HPAI outbreak was largely confined to a number of adjacent municipalities in the southeastern parts of the province; however, the H5N8 HPAI outbreak had a greater geographic distribution. This finding suggests that the epidemiology of these two outbreaks was different.

The 2011 and 2017 HPAI outbreaks in the ostrich population were detected earlier than the expected arrival of overwintering Palearctic flyway migrants into southern Africa. The Palearctic flyway includes the southern parts of South Africa with migrant Eurasian birds expected to arrive in late September and early October (Caron et al., 2012). This suggests that the introduction of virus could not be attributed directly to overwintering Eurasian flyway wild migratory birds without incorporation of a bridging species, possibly through intra-Africa wild bird migration. This is consistent with a previous suggestion that the spread of the H5N8 HPAI virus in Africa was possibly through intra-Africa wild bird migration (Fusaro et

al., 2019). African wild water fowl reside year-round within Africa (Gaidet et al., 2012) but move great distances within the continent (Oately and Prys-Jones, 1986). Dendrocygnid (whistling) ducks might play an important regional role in the dynamics of AIV transmission due to their relative abundance, mobility, extensive African range and likelihood of the population north of the equator mixing with Palearctic species (Cumming et al., 2011). However, the H5N2 virus might also have been introduced into ostriches earlier since H5 antibodies were detected during 2010 and an evolutionary molecular clock analysis suggested introduction of the progenitor strain as early as May 2010 (Abolnik et al., 2012). The results of this study suggest different points of introduction for the two outbreaks in the ostrich population**.** The index cases were detected in areas with different geographic and environmental features. The Oudtshoorn Local Municipality (2011) is an inland area with a semi-arid to arid climate and supplied by perennial rivers and seasonal waterways where ostrich farms are mainly located. The Hessequa Local Municipality (2017) is a coastal municipality with substantial wetlands. Cases were mainly reported in ostrich farm dense municipalities during the 2011 outbreak, whilst cases during the 2017 outbreak were also detected in more coastal and inland municipalities with very low ostrich farm density.

It has been previously reported that the 2011 HPAI outbreak was caused by a LPAI precursor that mutated into HPAI within the ostrich population (Abolnik et al., 2012). However, the multimodal appearance of the 2011 epidemic curve is more consistent with multiple point introductions from the environment via indirect transmission by either wild birds or fomites and subsequent limited transmission occurring among farms with social links. Multiple point introductions are further supported by the lack of spatial clustering during the second temporal peak. The detection of fewer cases during May and the subsequent resurgence of infection suggest a reservoir of infection in the Oudtshoorn area. During this outbreak, it appears that virus represented in the epidemiological groups A and B were co-circulating in

the environment but possibly with different spatial extents. Epidemiological A group virus was detected earlier and had a longer temporal occurrence although the B group was found to precede the A group virus phylogenetically (Abolnik et al., 2012).

The 2017 outbreak had a temporal pattern consistent with a contagious disease and propagated transmission. The curve had an extended stationary phase with sporadic case detection indicating a reduced reproduction number and possibly a reduction in contacts with the susceptible ostrich population. However, this temporal evidence for transmission by direct contact or droplet spread is circumstantial and more efficient indirect transmission routes from the environment or through an intermediate host at the beginning of the outbreak cannot be excluded as a possibility. The spatiotemporal clusters in the Oudtshoorn Local Municipality during the outbreaks were located in different areas, except for an intersection of the clusters during the initial phase of both outbreaks. This area of intersection potentially had factors conducive to virus introduction or spread at the onset of both outbreaks. The overall spatial cluster identified for the 2011 outbreak was consistent with a previous report of H5 seropositive farms in the Oudtshoorn region and the Southern Cape (Thompson et al., 2008). In 2017, the spatial cluster covered with near precision areas that were identified as high-risk for AI based on environmental factors and risks due to wild birds (Cumming et al., 2008).

Environmental conditions and biosecurity are the main factors influencing occurrence of AI on farms (Wang et al., 2014). The difference in the position of the spatial clusters identified potentially indicate differences in the risk factors for introduction with each outbreak. This suggests that the extent to which these factors affected introduction differed with each outbreak or the combination of factors associated with introduction during these two outbreaks varied. Ultimately, the outdoor range farming of ostriches in conjunction with wild bird movements might have contributed to more contact at the wild/domestic bird species

interface. During the 2017 outbreak, Mossel Bay Local Municipality had a low-rate cluster (lower than expected AI prevalence) and this was unexpected due to its large ostrich farm population. This municipality is also in close proximity, and has similar geographic features to the Hessequa Local Municipality, part of the detected high-rate cluster. The Mossel Bay area might therefore be a key to learning more about AI epidemiology in general and the dynamics of HPAI introduction and spread in particular.

The 2011 outbreak was characterised by limited spatial dispersal of infection, whilst the 2017 outbreak had an extensive geographical distribution. During the 2011 outbreak, localized infection of susceptible premises in already affected areas continued, supporting the hypothesis of multiple introductions from an environmental reservoir. The type of husbandry practices and differences in farm biosecurity measures might also have facilitated viral introduction. The pattern of the 2017 outbreak was characterised by a general scattered occurrence over long distances. Sources of long-distance transmission in the province could include movement of either ostriches, fomites such as contaminated feed trucks and transport vehicles or other affected bird species. Virus was also detected in domestic commercial poultry, backyard poultry, wild water fowl, coastal birds and other inland species during this outbreak (OIE, 2020). The differences in the spatial distribution during outbreak stages also support the hypothesis of a variation in the mechanism of disease spread between the 2011 and 2017 outbreaks. Differences highlight the complexities of AI in ostrich populations with possible differences in the interaction of environmental, geographic and farm-level factors with each outbreak.

The directional orientation of the two outbreaks was different with the 2011 outbreak relatively stationary compared to the 2017 outbreak, which exhibited directionality and differences over time suggesting long distance transmission. The 2011 outbreak had a radial pattern, with the only directional orientation linking areas of high ostrich farm density. The

directional pattern for the 2011 outbreak could have been due to the manner in which surveillance was implemented. Following the HPAI virus confirmation, a control area was instituted in the Oudtshoorn area where rounds of surveillance for AIV were implemented on all farms with birds available for sampling. Forty of the farms affected during this outbreak were located in this control area (Abolnik et al., 2012; van Helden et al., 2016). This was unlike the 2017 outbreak where intensified surveillance was largely carried out on farms within a 10 km distance of each affected farm.

The epidemiological groups A and B had different but overlapping spatial distributions during the 2011 outbreak. The disparity in the spatial distribution in conjunction with epidemiological group A being detected first despite having apparently evolved from an epidemiological group B virus, further supports multiple point introductions that could have resulted from contact with different environmental reservoirs.

There were a number of limitations that might have influenced the presented findings. Firstly, differences in the implementation of surveillance in municipalities during the two outbreaks might have introduced surveillance bias, especially during the 2011 outbreak. This bias might have affected the distribution of cases and the cluster detection methods. Some cases were also excluded from the study. Cases recorded in other provinces where ostriches are farmed (these data could not be accessed at the time of this study), as well as sporadic cases that occurred in the study province after 2018 (OIE, 2020) were excluded from analysis in the present study. However, the virus variant that caused the outbreak in the Western and Eastern Cape Provinces in 2017 was only detected in those two provinces and quite distinct from the virus causing the outbreaks in the northern parts of the country (Abolnik et al., 2019). Excluded cases could have affected the directional distribution of the outbreaks without

necessarily affecting the clustering pattern due to the few numbers and sporadic nature of detections. Changes in the population at risk over time due to deregistration and reregistration of facilities as well as changes in farm ostrich populations during production periods might have biased the census data and ultimately the number of farms included or excluded during the study period.

The case definition and inclusion of suspected cases in the study might have caused an over estimation of case numbers due to false-positive serological results and case misclassification. Also, outbreak start dates might be inaccurate especially for suspected cases that were diagnosed based on serological results alone since serological testing might not detect early stages of AI infection (van Helden et al., 2016). Additionally, serological testing for AI without subsequent virus detection and isolation cannot distinguish HPAI from LPAI infection and HI testing is reliable only to determine the H-type of a virus. Confirmed cases made up less than 50% of the detected cases in both study periods; however, results from cluster analysis of confirmed cases only were superimposable on the combined results from both suspected and confirmed cases. The confirmed cases therefore appear to be a random subset of all evaluated cases and the inclusion of suspect cases in the analysis is unlikely to have caused substantial bias.

5. Conclusions

Farm density might play an important role in the epidemiology of HPAI infection in ostriches, as expected for many other infectious diseases. Palearctic flyway migrant birds are unlikely to have played a role directly initiating the HPAI outbreaks with intra-Africa wild waterfowl and possibly passerine species being more likely to be important in the epidemiology of HPAI in the ostrich populations of South Africa. The mechanism of spread of HPAI and geographical predispositions appeared different between the 2011 and 2017 outbreaks; an aspect that is important when implementing control strategies. For example,

environmental contamination might have played a more important role during the 2011 outbreak.

The different epidemiological patterns between the two outbreaks should be considered when designing surveillance and testing strategies for HPAI control. Potential considerations include the defining of AI control zones, performing risk-based surveillance and considering environmental as well as wild bird sampling. Further investigations on the potential methods of AI spread during outbreaks and associated risk factors are required in order to continually inform the surveillance and control strategies in ostrich populations.

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Acknowledgements

Western Cape Department of Agriculture, South Africa for providing the data during the period of study.

Funding

Partial funding for this project was provided by the National Research Foundation (NRF) of South Africa through the Community of Practice (COP) in Sanitary and Phytosanitary Risk Assessment (Grant number 120317).

Table 1. Descriptive statistics of the ostrich farm/holding population and high pathogenicity avian influenza case occurrence during the 2011 H5N2 and 2017 H5N8 outbreaks in the Western Cape Province of South Africa

	2011 outbreak	**2017 outbreak**
Numbers of farms visited for surveillance purposes	609	340
Total number of cases	43	51
Number of confirmed cases	20	19

Cases detected through routine surveillance	9	34
Number of holdings with missing gps data*	15	-
Duration	9 months	August 2017- December 2018; although ongoing or sporadic cases continued in 2019
Location of index case	Oudtshoorn Local Municipality	Hessequa Local Municipality
Time of onset	March (Autumn)	August (Winter)
Distance between index and furthest case	144 km	269 km

**Centroid of the local municipality of location was used*

Figure legends

Figure 1. The Western Cape Province of the Republic of South Africa.

Figure 2. The number of reported suspect ostrich farm cases (any farm from which positive HI serology results) and confirmed cases (any farm that tested RT-PCR positive or where the virus was isolated) per month in the Western Cape Province, including the identified epidemiological group classified as epidemiological groups A and B based on the

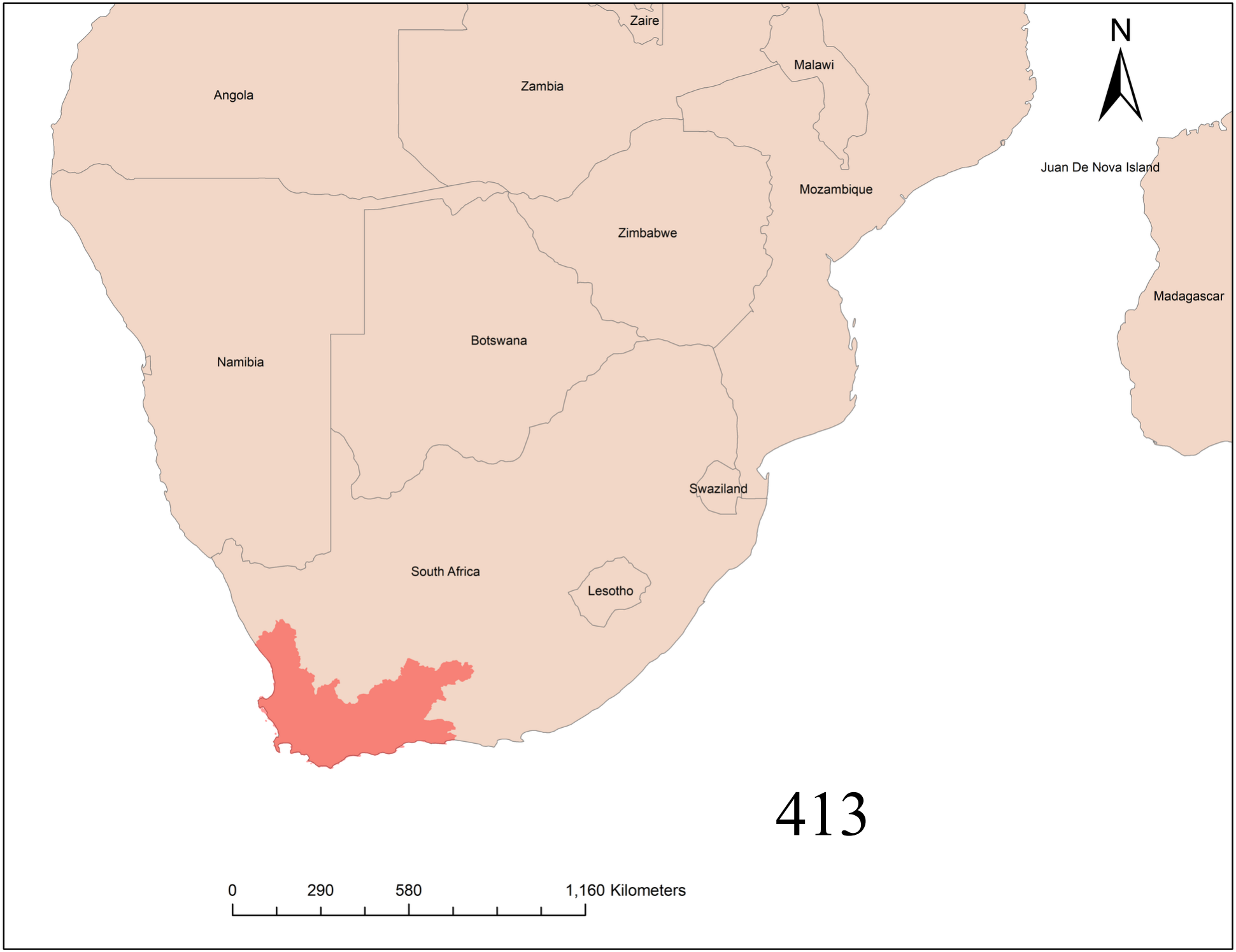
phylogenetic comparison, AB (where both groups were identified) as well as undetermined (for those that could not be classified), during the 2011 H5N2 high pathogenicity avian influenza outbreak **(A).**The number of reported ostrich farm cases during the 2017 H5N8 high pathogenicity avian influenza outbreak **(B).**

Figure 3. Spatial and spatiotemporal clusters of affected ostrich farms in the Western Cape Province during the high pathogenicity avian influenza outbreaks with ostrich farm density presented per 10 km². There was a single significant spatial cluster of all cases (20.79 km radius and 34 cases) and a low-rate spatial cluster (414.4 km radius with one case). There was a single significant spatiotemporal cluster of all cases (27.94 km radius and 17 cases) and a single significant spatiotemporal cluster of cases detected through routine surveillance only (14.43 km and three cases) for the 2011 H5N2 outbreak **(A).** There was a single significant spatial cluster of all cases (144.7 km radius and 20 cases), a spatial low-rate cluster (34.8 km radius and one case) and spatial cluster of routine surveillance detected cases (188 km radius, with 18 cases). A primary (14.94 km radius and eight cases) and secondary (17.88 km radius and nine cases) spatiotemporal cluster were also identified for the 2017 H5N8 outbreak. The primary cluster is the cluster with the largest increase in the number of cases and the secondary cluster has a smaller increase in the number of cases but still statistically significant. **(B)**.

Figure 4. Directional distribution depicting the size and movement of the outbreak for each seasonal quarter of the 2011 H5N2 high pathogenicity avian influenza outbreak in the Western Cape Province.

Figure 5. Directional distribution depicting the size and movement of the outbreak for each seasonal quarter of the 2017 H5N8 high pathogenicity avian influenza outbreak in the Western Cape Province.

Figure 6. Directional distribution depicting the size and movement of the outbreak for each epidemiological group A and B of the 2011 H5N2 high pathogenicity avian influenza outbreak in the Western Cape Province.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N
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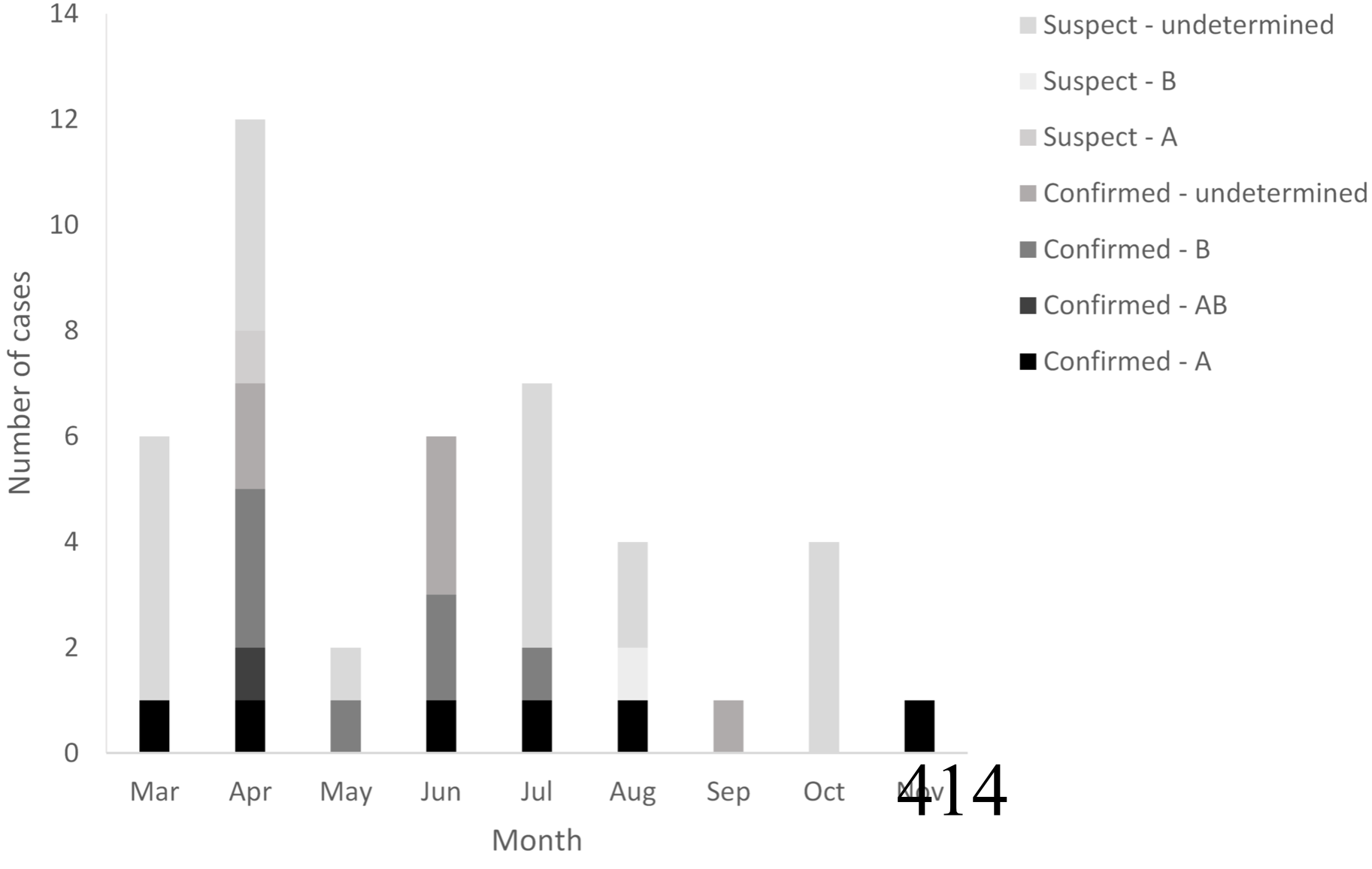
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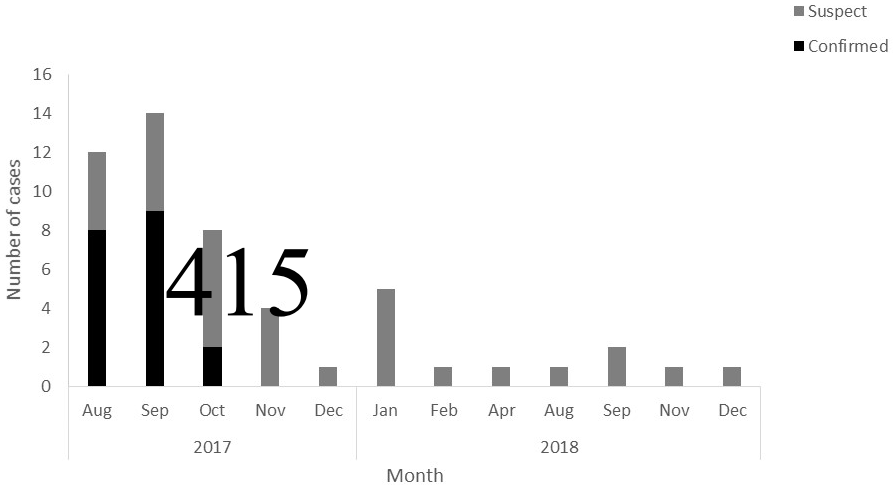
Suspect - B
Suspect - A
Confirmed - undetermined
Confirmed - B
Confirmed - AB
Confirmed - A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Confirmed
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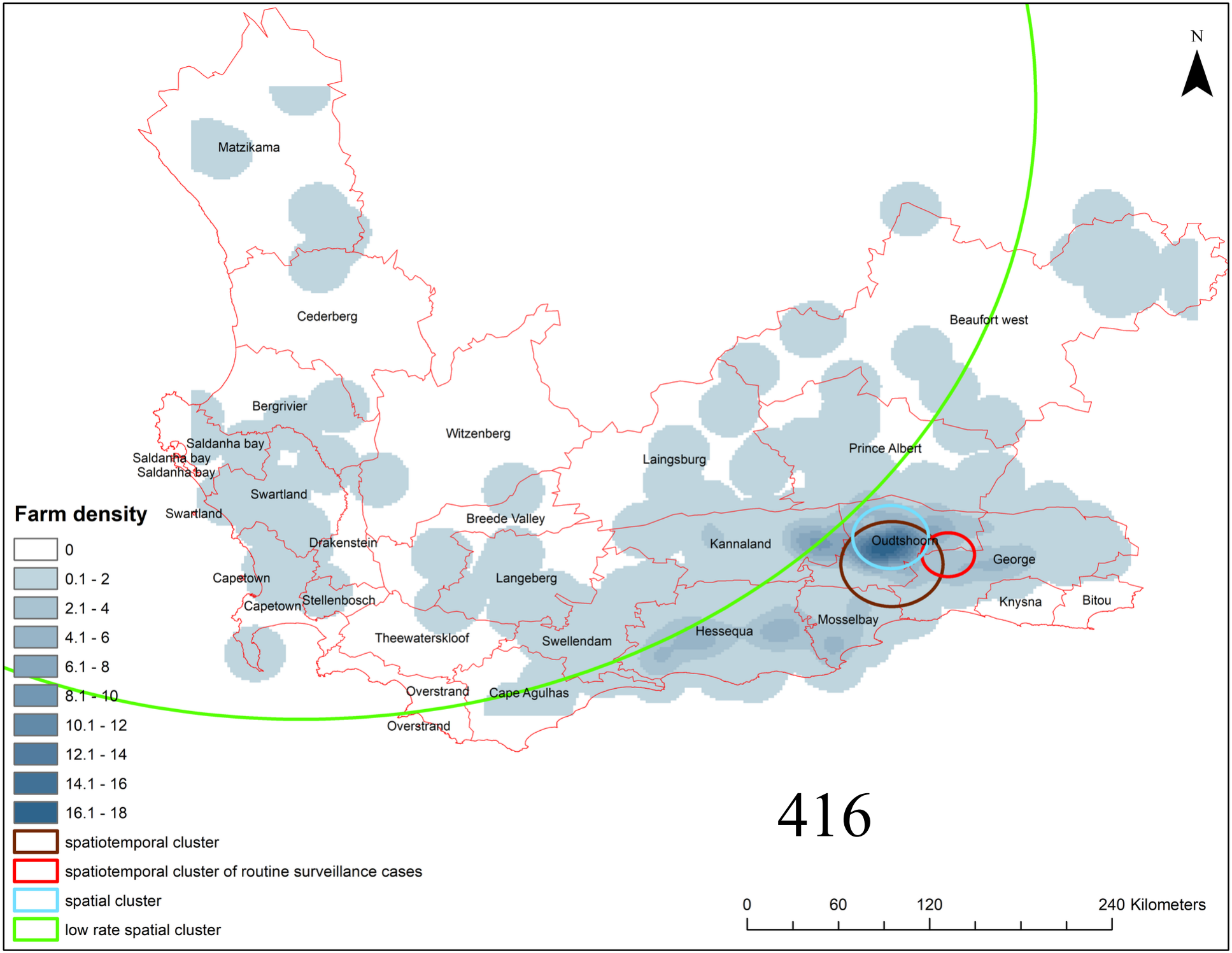
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Capetown
Capetown
Stellenbosch
Langeberg
Theewaterskloof
Overstrand
Overstrand
Cape Agulhas
Swellendam
Laingsburg
Prince Albert
Beaufort west
Kannaland
Oudtshoorn
George
Knysna
Bitou
Mosselbay
Hessequa
Farm density
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6.1 - 8
8.1 - 10
10.1 - 12
12.1 - 14
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spatiotemporal cluster
spatiotemporal cluster of routine surveillance cases
spatial cluster
low rate spatial cluster
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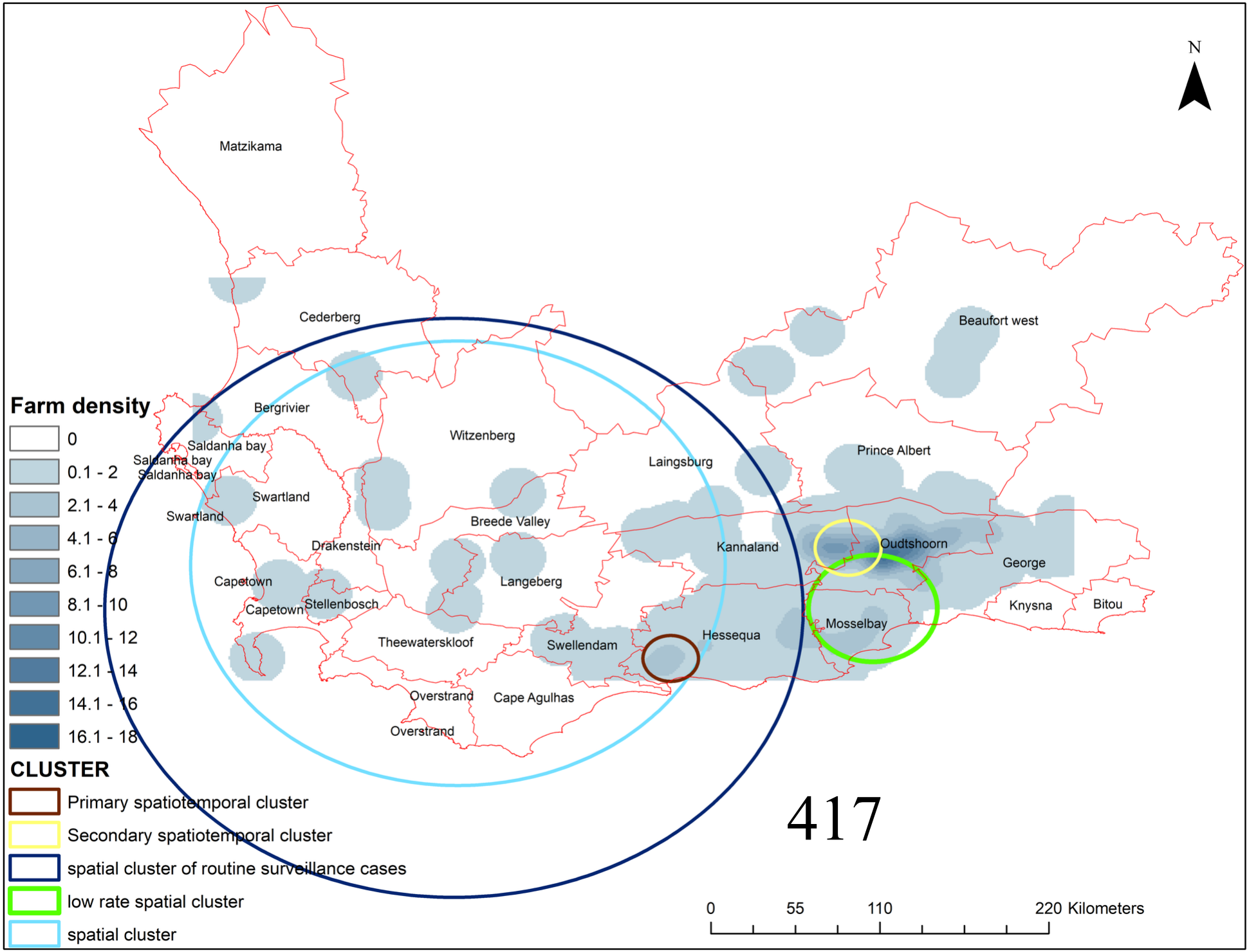
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Overstrand
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Cape Agulhas
Swellendam
Hessequa
Laingsburg
Kannaland
Beaufort west
Prince Albert
Oudtshoorn
George
Knysna
Bitou
Mosselbay
Farm density
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10.1 - 12
12.1 - 14
14.1 - 16
16.1 - 18
CLUSTER
Primary spatiotemporal cluster
Secondary spatiotemporal cluster
spatial cluster of routine surveillance cases
low rate spatial cluster
spatial cluster
417
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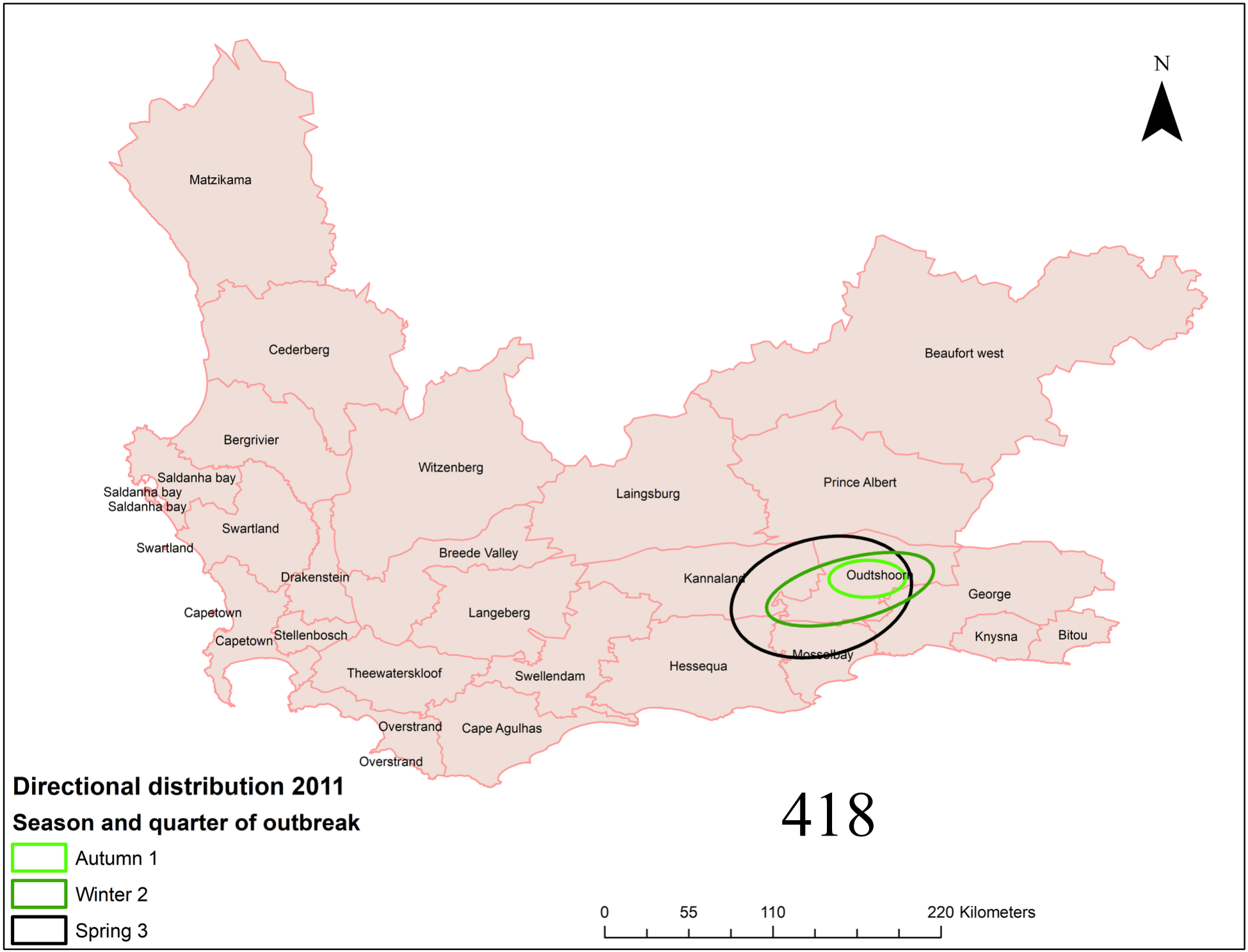
55
110
220 Kilometers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Overstrand
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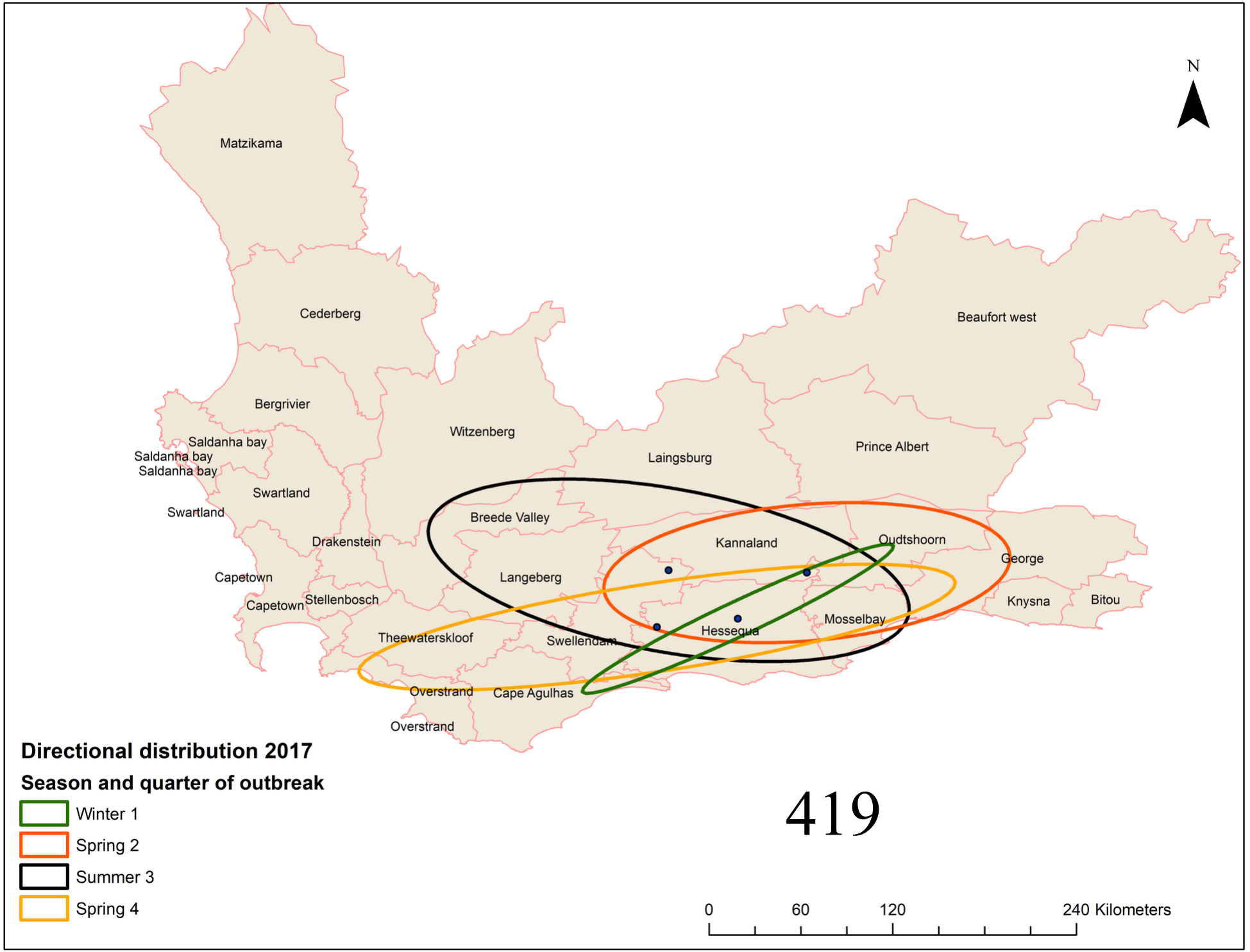
Cape Agulhas
Swellendam
Laingsburg
Kannaland
Hessequa
Beaufort west
Prince Albert
Oudtshoorn
George
Mosselbay
Knysna
Bitou
Directional distribution 2011
Season and quarter of outbreak
Autumn 1
Winter 2
Spring 3
418
0
55
110
220 Kilometers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Cape Agulhas
Swellendam
Laingsburg
Kannaland
Hessequa
Beaufort west
Prince Albert
Oudtshoorn
George
Mosselbay
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Directional distribution 2017
Season and quarter of outbreak
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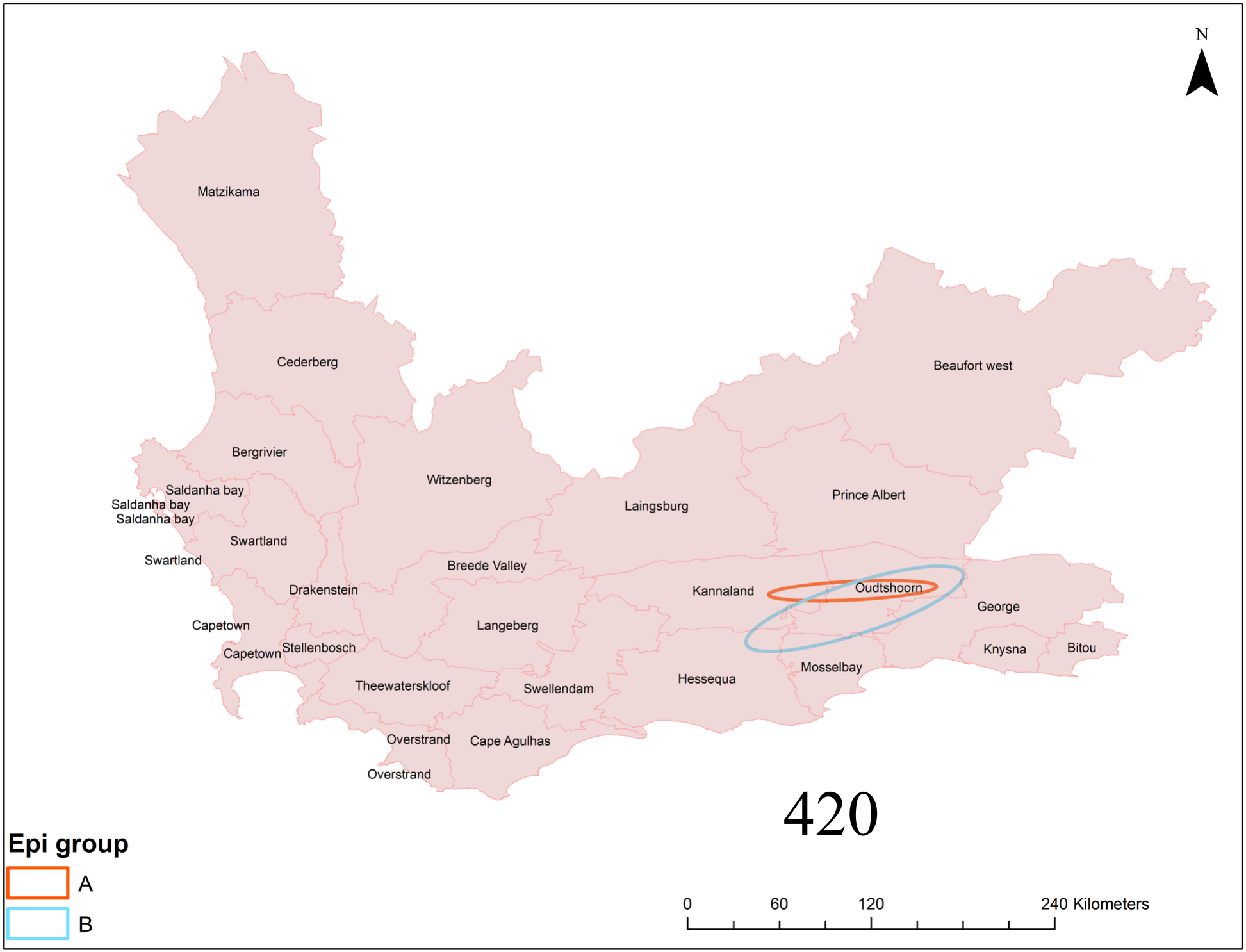
Spring 2
Summer 3
Spring 4
419
0
60
120
240 Kilometers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Stellenbosch
Breede Valley
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Theewaterskloof
Overstrand
Overstrand
Cape Agulhas
Swellendam
Laingsburg
Prince Albert
Beaufort west
Kannaland
Oudtshoorn
George
Knysna
Bitou
Mosselbay
Hessequa
420
Epi group
A
B
0
60
120
240 Kilometers

DHS SCIENCE AND TECHNOLOGY

Master Question List for Highly Pathogenic Avian Influenza (HPAI)

August 08, 2024

For comments or questions related to the contents of this document, please contact the DHS S&T Hazard Awareness & Characterization Technology Center at HACTechnologyCenter@hq.dhs.gov.

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Foreword

This Master Question List (MQL) was developed by the Department of Homeland Security Science and Technology Directorate (DHS S&T) to present the current state of available information to government decision makers. This MQL quickly summarizes what is known and what additional information is needed to address fundamental questions such as, “What is the infectious dose?” and “How long does the virus persist in the environment?” The information provided is a succinct summary to allow structured and scientifically guided discussions across the Federal Government without burdening them with the need to review scientific reports, and to prevent duplication of efforts by highlighting and coordinating research.

Introduction

Of the four types of influenza viruses (A, B, C, and D), influenza A virus is the only virus known to cause pandemics. Influenza A virus is further classified into subtypes according to two proteins on the surface of each virus that help it invade host cells: haemagglutinin (i.e., H or HA) and neuraminidase (i.e., N or NA). Subtypes (e.g., H5N1) can be classified into clades and further into genotypes based on genetic similarity. Influenza A viruses are found in mammalian species, including humans, swine, canines, and avian species across the globe. Avian influenza viruses (AIVs) naturally circulate among waterfowl and other migratory wild aquatic birds including ducks, geese, shorebirds, and gulls.[1] These bird-specific strains of influenza are typically categorized as having low pathogenicity (low pathogenicity avian influenza [LPAI]), meaning that infected birds show no signs of disease or the symptoms expressed are mild. When LPAI is introduced from waterfowl and other wild aquatic birds into domestic poultry such as chickens or turkeys, LPAI can mutate into high pathogenicity (i.e., HPAI), meaning infection causes severe disease in birds and is often fatal. The distinction between LPAI and HPAI is made based on the lethality of AIV strains to domestic chickens, as the mutation from LPAI to HPAI typically occurs upon replication in domestic poultry species.[2] One exception is known, which are the H5 viruses of the A/Goose/Guangdong/1/1996 lineage (GsGd) that circulate in wild migratory birds as HPAI

and can be directly transmitted to domestic poultry as HPAI. Since 2014, GsGd clade 2.3.4.4 viruses have been predominant in global HPAI outbreaks, and responsible for the ongoing outbreak in the United States that began in early 2022.[3-4] The U.S. agricultural concerns and resources have been concentrated on responding to outbreaks and reducing the risk to domestic commercial poultry;[5] however, detections of clade 2.3.4.4b genotype B3.13 viruses in U.S. livestock herds were first reported in March 2024 and are an ongoing concern.[6] As of 31 July 2024, HPAI has been detected in 175 livestock herds in 13 states.[7] The spread to livestock has also been associated with new cases of HPAI in humans with four reported cases since April 2024.[8]

Key Updates

- GsGd lineage HPAI H5N1 clade 2.3.4.4b viruses first emerged Europe in 2020, spread to North America by late 2021,[3] and are responsible for the ongoing global outbreaks.[9-10]
- The ongoing U.S. HPAI outbreak began 8 February 2022 and has affected more than 100.71 million birds from 1,172 flocks in 48 states (as of 31 July 2024).[11]
- The ongoing global HPAI outbreak has impacted wildlife at an unprecedented level with expansion of both the number and diversity of mammalian and avian species infected. Additionally, disease severity has been greater compared to other influenza viruses affecting wildlife.[12-13]
- In early March 2024, HPAI was detected in a juvenile goat in Minnesota. Previously, natural HPAI infection had not been reported in domestic ruminants (i.e., goats, cattle, sheep).[14]
- Samples obtained from Texas and Kansas dairy cattle herds confirmed HPAI on 25 March 2024.[6]
- As of 31 July 2024, HPAI has been detected in 175 livestock herds in 13 states with Texas, Idaho, Colorado, Michigan, and Ohio reporting the highest number of affected herds.[7]
- The spread to livestock has also been associated with new human cases of HPAI in the U.S. with four reported cases in patients exposed to infected livestock and nine reported cases in patients exposed to infected poultry since April 2024.[8]

The cutoff date for information gathering related to this document was 07/31/2024.

Major Findings by Topic Area	
Topic	**Overview of Current Knowledge**
INFECTIOUS DOSE	• The median infectious dose (ID_{50}) of HPAI in birds depends on virus strain and host species, and can range from $<10^{1}$ to $10^{4.6}$ egg ID_{50} • The ID_{50} in humans of HPAI is currently unknown
TRANSMISSIBILITY	• The main exposure and shedding routes for HPAI virus in birds are via oral and cloacal (i.e., urinary, gastrointestinal, genital tract) routes • Migratory waterfowl, primarily of the Anatidae family (ducks, geese, and swans), are major carriers of novel virus strains. The identification of new HPAI strains in poultry is more prevalent within migratory pathways • Farms located near bodies of water, with large flock sizes, or located in an area of high farm density are at increased risk • Dairy cattle may be infected by HPAI via respiratory or mammary exposed routes; however, cattle appear to be more susceptible to mammary exposure and symptoms are similar to what is observed in infected cattle on dairy farms • 2021-2024 reports of confirmed human cases all involve close contact with poultry, infected livestock, or environmental exposure
HOST RANGE	• Migratory aquatic birds are the primary natural reservoir for most subtypes of AIVs, but domesticated poultry and other birds can also be infected • The ongoing global HPAI outbreak has impacted wildlife at an unprecedented level with expansion of both the number and diversity of mammalian and avian species infected. Additionally, disease severity has been greater compared to other influenza viruses affecting wildlife • Since March 2024, HPAI has been detected in over 135 dairy herds in 12 states with Texas, Idaho, Colorado, Michigan, and Ohio reporting the highest number of affected herds. HPAI has also been detected in U.S. goats and alpacas in isolated cases • Since 2020 when H5N1 clade 2.3.4.4b emerged, there have been case(s) reported in Laos, Ecuador, Australia, Chile, India, Spain, Vietnam, China, the U.S., the United Kingdom, and Cambodia
INCUBATION PERIOD	• Incubation periods for HPAI in poultry vary and are dependent on infectious dose, transmission acquisition, and environmental factors. Determination of infection duration and incubation time is confounded when no clinical symptoms are present. Naturally infected chickens have an incubation period from 3-14 days • Humans infected with H5N1 AIV generally show clinical symptoms 2-5 days after exposure, though longer incubation periods (≤17 days) are possible

CLINICAL PRESENTATION	• HPAI and LPAI refer to high or low pathogenicity in domestic chickens (respectively), not humans or other animals • HPAI can cause up to 100% mortality in infected chickens. Clinical presentation in birds can include mild to severe respiratory disease signs as well as neurological issues, problems with egg production and formation, and sudden death • Infected mammals can present with clinical signs often found in other diseases, including fever, coughing, lethargy, diarrhea, and weight loss, with neurological signs such as seizures, ataxia, or tremors also possibly occurring • Dairy cattle may experience reduced appetite, drop in milk production and/or thickened milk, and nasal discharge. Initial reports of illness in dairy cattle indicated that clinical presentation peaks in about three to four days and lasts 10 to 14 days • Fever is common in human infection, but not always present. The less common symptoms to be aware of include nausea or vomiting, diarrhea, or seizures • Recent human cases involving exposure to infected cattle have also presented with fever, chills, cough, and conjunctivitis
BIOSURVEILLANCE AND CLINICAL DIAGNOSIS	• The primary method of detecting AIV in poultry flocks and cattle herds is real-time reverse transcription polymerase chain reaction (rRT-PCR) from cloacal and oropharyngeal/tracheal swabs, sampling from sick and dead birds, manure, and sampling from milk/udder secretions of cattle • Migratory birds that travel long distances have a major role in the global spread of AIVs • Monitoring for HPAI in wildlife is conducted by the U.S. Department of Agriculture (USDA) in the U.S., as well as by international partners in their respective regions • Pre-movement testing is required for all lactating cattle; however, biosurveillance guidelines for cattle are still being established • Due to the multi-faceted nature of the spread of HPAI to cattle, response and monitoring is shared by the USDA, Food and Drug Administration (FDA), and Centers for Disease Control and Prevention (CDC) in the U.S.
VETERINARY MEDICAL COUNTERMEASURES	• There are several medications available that reduce clinical signs and potential for transmission in infected poultry, though they are not used in the U.S. • Palliative care is recommended for infected cattle
HUMAN MEDICAL COUNTERMEASURES	• For humans with confirmed or suspected Influenza A infection, antiviral drugs may be used for treatment and prophylaxis if given early in symptom progression or before symptoms begin • Humans with confirmed or suspected novel influenza should be given neuraminidase inhibitor drugs (e.g., oseltamivir, peramivir, and zanamivir) for treatment

VACCINES	• The human seasonal flu vaccines do not protect against AIV H5N1 • Globally, there are several existing vaccines against AIV in poultry, though their use is not consistent across impacted countries. USDA maintains emergency poultry vaccination guidelines, procedures, and vaccine recommendations • One complication in vaccination campaigns is vaccinated birds become difficult to differentiate from infected birds, which may impact trade • HPAI vaccination of ducks and poultry may reduce virus shedding following challenge with GsGd lineage HPAI virus
DEPOPULATION/ CARCASS DISPOSAL	• Within 24-48 hours of HPAI notification on farms, the USDA defined standard practice is depopulation with water-based foam systems for floor-raised birds or gassing for caged birds • USDA disposal methods for poultry include composting, burial, incineration, rendering, and landfilling • Early detection and reporting and time to depopulation directly impacts the spread of HPAI and successful containment. On average, 12 days are needed for on-site staff to recognize illness and initiate reporting • USDA APHIS does not currently recommend depopulation of cattle. Infected livestock should be monitored for disease progression and supported with palliative care. Return to the herd should be determined with the assistance of veterinarians
VIRAL PERSISTENCE AND ENVIRONMENTAL STABILITY	• Influenza viruses may remain viable on surfaces for up to two weeks • AIV persistence varies based on the environmental matrix and exposure to natural environmental factors (heat, ultraviolet [UV] exposure, salinity, and pH) • AIVs are extremely stable in water, showing infectivity after several months in cold weather natural wetlands • Initial studies indicate that H5N1 genotype B3.13 persists in milk on stainless steel milking equipment for over an hour and on rubber components for over 3 hours
DECONTAMINATION	• The U.S. Environmental Protection Agency (EPA) maintains a list of registered chemical compounds for use in disinfection against avian influenza on farm settings, including bleach, alcohol, and quaternary ammonium-based compounds such as Lysol® and Formula 409® all-purpose cleaners • The Animal and Plant Health Inspection Service (APHIS) of the USDA maintains protocols for cleaning and disinfection of facilities affected by HPAI • Various decontamination methods have been evaluated for poultry and cattle products to control the spread of AIV • The FDA and USDA recommend that any discarded milk should be heat-treated or pasteurized before disposal

	• The situation in livestock is rapidly evolving and specific guidance for decontamination of milking equipment, dairy products, and meat processing is likely to forthcoming
PERSONAL PROTECTIVE EQUIPMENT (PPE)	• There is effective PPE for those with potential exposures to HPAI, with the recommended type of PPE dependent on the type of exposure (e.g., poultry workers, laboratory staff, depopulation workers) • Recommended PPE for poultry workers includes safety goggles, disposable gloves, boots, a respirator (National Institute for Occupational Safety and Health [NIOSH]-certified at N95 or higher), apron, disposable head/ hair cover, and disposable fluid-resistant coveralls
GENOMICS	• AIVs are defined by the presence (HPAI) or absence (LPAI) of a polybasic cleavage site in the HA gene • Since at least 2014, most of the continuously evolving and circulating GsGd lineage HPAI H5 variants have belonged to clade 2.3.4.4 • As of 20 June 2024, GsGd H5N1 clade 2.3.4.4b viruses have been detected on all continents (i.e., Europe, Asia, Africa, North America, South America, and Antarctica), except Oceania (i.e., Australia and other islands between mainland Asia and the Americas) • Circulating viruses are often screened for mutations known to reduce efficacy of antivirals. Clade 2.2 viruses appear to retain susceptibility to neuraminidase inhibitor drugs and baloxavir. However, novel mutations have been identified in these viruses that reduce susceptibility to adamantane, oseltamivir, baloxavir, zanamivir, or peramivir • Viruses isolated from infected dairy cattle are from the 2.3.4.4b clade but belong to a new genotype, B3.13
VIRUS IMPORTATION	• Importation predominately occurs via close interactions between wild migratory birds and domestic poultry, though other sources may also play a role • Modeling suggests that wild bird migration and illegal poultry trade are primary forms of HPAI introduction, and that the legal poultry trade is not a major importation risk • Movement and trade of livestock within the U.S. is encouraged to be minimized at this time and should not occur if any cattle or other animals on the premises display disease symptoms. Pre-movement testing is required for all lactating cattle and a 30 day quarantine is recommended after arrival of dairy cattle

Infectious Dose – How much agent will cause illness?

What do we know?

Typically, the median infectious dose (ID_{50}) of AIV in birds is measured in median egg infectious dose units (EID_{50}), representing the amount of virus needed to infect 50% of inoculated eggs. For each measure, lower values indicate greater infectivity, as less virus is needed for infecting a host.

- The ID_{50} of HPAI in birds depends on virus strain and host species, and can range from $<10^1$ to $10^{4.6}$ EID_{50} (estimated from reported values among ducks, chickens, and turkeys infected by intraocular, intratracheal, intrachoanal, and intranasal inoculation).[15-17]

The infectious dose of HPAI is dependent on HPAI strain and species infected.

- Experimental intrachoanal inoculation of chickens and turkeys with different GsGd lineage HPAI H5N2 strains resulted in similar ID_{50} values ranging from 10^3 to $10^{5.1}$ EID_{50} for A/turkey/MN/12582/2015, A/turkey/SD/12511/2015, A/chicken/IA/13388/2015, A/northern pintail/WA/40964/2014, and A/turkey/Arkansas/7791/2015.[18-19]
- Experimental intranasal inoculation of ducks, with three GsGd lineage HPAI H5N2 strains (A/Tk/MN/15, A/Ck/IA/15, and A/Np/WA/14) determined a low infectious dose of $<10^2$ EID_{50} with no mortality observed at low (10^2 EID_{50}) or high (10^6 EID_{50}) doses. In contrast, a GsGd lineage HPAI H5N1 strain (A/Ws/Mongolia/05) had a mortality of 100% at the lowest dose (10^2 EID_{50}) despite having a similar ID_{50} of $<10^2$ EID_{50} dose.[18]
- Six-week-old chickens intranasally inoculated with 10^6 EID_{50} of GsGd lineage HPAI H5N8 (A/Wildbird/Cixi/Cixi02/2020) began to die 3 days post-infection (d.p.i.) with all infected chickens dying by 5 d.p.i.[20] Comparing GsGd lineage HPAI H5N8 strains isolated in Japan, the ID_{50} for chickens varied between strains from $10^{2.75}$ to $10^{3.50}$ EID_{50} and time to death ranged from 4 to 9 d.p.i depending on dose and strain.[21]
- The ID_{50} of GsGd lineage HPAI H5N1 A/chicken/England/053052/2021 strain was determined through oculo-nasal infection of chickens and ducks. The ID_{50} was determined to be $<10^3$ EID_{50} for ducks and $10^{4.67}$ EID_{50} for chickens.[22]
- The ID_{50} of a non-GsGd lineage HPAI H7N8 strain A/turkey/IN/16-001403-1/2016 was determined to be $10^{3.2}$ EID_{50} for chickens and $10^{2.5}$ EID_{50} for ducks; however, it was lowest for turkeys $<10^2$ EID_{50}.[23]

Wild fowl ~~also~~ show lower mortality than domestic poultry when experimentally infected with the same HPAI strain. Wild fowl may appear clinically normal while harboring systemic infections and shedding infectious virus for several days,[24-26] but this will vary depending on the HPAI strain.[27]

- Intranasal inoculation of rooks (*Corvus frugilegus)* with GsGd lineage HPAI H5N1 (A/mandarin duck/Miyazaki/22M807-1/2011) resulted in subclinical infection, but viral shedding from the oral cavity was $<10^3$ EID_{50} 1-5 days post-infection (d.p.i).[28]
- Intranasal inoculation of ducks with $\geq 10^4$ EID_{50} GsGd lineage HPAI H5N6 (Clade 2.3.4.4e HPAI Tottori/1) caused subclinical infection with low oral viral shedding, but systemic infection from higher dosing led to higher viral shedding ranging from $10^{4.5}$-$10^{5.7}$ EID_{50}.[29]

The median human infectious dose (HID_{50}) of HPAI is currently unknown; however, controlled studies have determined the ID_{50} for mammalian model organisms.

- Infection of ferrets with three strains of GsGd lineage HPAI H5N1 viruses (A/Vietnam/1203/2005, A/Muscovy duck/Vietnam/209/05, A/Whooper

swan/Mongolia/244/05) was achieved with 10^6 EID_{50} intranasally and ~$10^{9.5}$ EID_{50} through consumption of infected meat. Infection occurred with $10^{8.3}$ EID_{50} after direct gastric exposure to meat infected with A/Vietnam/1203/2005.[30]

- Non-human primates (NHPs) exposed to 4 x 10^7 plaque forming units (PFU) of aerosolized GsGd lineage HPAI H5N1 (A/Vietnam/UT3040/2004) presented viral titers of $10^{3.60}$, $10^{2.90}$, and $10^{2.34}$ PFU/mL 1 d.p.i. from nasal swabs. Conventional inoculation of NHPs presented higher or equivalent viral titers of $10^{2.40}$, $10^{2.30}$, $10^{4.53}$, and $10^{4.28}$ PFU/mL 1 d.p.i.[31]
- Experimental inoculation of guinea pigs with a non-GsGd lineage HPAI H7N9 virus (A/Anhui/1/2013) determined an ID_{50} of 3 PFU.[32]

What do we need to know?

- How infectious are AIVs in humans compared to seasonal influenzas?
- Is the infectious dose of AIV route-dependent? How does the aerosol route of exposure compare?
- What is the infectious dose in dairy cattle for respiratory and mammary routes of infection?

Transmissibility – How does it spread from one host to another? How easily is it spread?

What do we know?

The main exposure and shedding routes for HPAI virus in birds are via oral and cloacal (i.e., urinary, gastrointestinal, genital tract) routes, although respiratory exposure may also lead to HPAI infection.[33]

- HPAI H5N1 viruses replicate to high titers in the respiratory tract and intestinal tract, and virus is excreted in high titers in both feces and oral secretions.[34-35]
- Environmental transmission of HPAI H5N8 virus occurs via fecal contaminated water.[36] The estimated average number of secondary infections from a contaminated environment was three.[36]

Waterfowl, including ducks, appear to be driving the transmission of LPAI and HPAI to domestic poultry.

- While GsGd lineage viruses are the only HPAI viruses known to circulate in wild birds, HPAI viruses that have emerged from LPAI have been isolated from wild birds during outbreaks in poultry.[37]
- Migratory waterfowl, primarily of the Anatidae family (ducks, geese, and swans), are major carriers of novel virus strains. The identification of new HPAI strains in poultry is more prevalent within migratory pathways.[38]
- Higher cloacal virus shedding of both wild and domestic ducks appears to be a factor in transmission between wild birds and poultry.[22, 36, 39-40] Ducks appear to have age-dependent symptoms and shedding, with younger ducks experiencing higher levels of shedding and mortality.[41]
- The infected goats were located on a farm that had a known HPAI detection and it is speculated that the goats had been exposed via access to a shared water source.[14]
- Similarly, known dairy herd infections are believed to have originated from wild birds.[6]

The R_0 is the calculated value for communicable diseases that represents the number of additional birds that one infected bird can infect or the number of additional farms that an outbreak spreads to.

- Analysis of outbreaks between 2003-2018 in South Korea provided an R_0 estimate of 1.69, 1.60, and 1.49 for H5N1, H5N8, and H5N6, respectively.[42]
- Analysis of four commercial poultry HPAI H7 outbreaks estimated the farm-to-farm R_0, pre-intervention mean range 1.1 to 2.4.[43] Analysis of the 2016/17 HPAI H5N8 poultry farm outbreaks in in Hungary, Germany, Poland, and the Czech Republic estimated R_0 range 0.2-1.3 for farm-to-farm within countries.[44]
- The generation time between reported infection in one farm and confirmed infected in the next farm varied between 1.9-8.4 days, suggesting substantial variation in farm-to-farm spread.[43]
- Laboratory experiments of airborne transmission rates of HPAI H5N1 strain A/turkey/Turkey/1/2005 between chickens was low: 0.13 and 0.10 new infections per infectious bird at 0.2 meters and 1.1 meters distance, respectively,[45] which suggests bird-to-bird airborne transmission contributes less than other routes.
- Culling birds on infected farms, culling birds on contiguous premises, banning the restocking of emptied farms, and enforcing biosecurity measures including restrictions to reduce the number of vehicles and staff on and among farms can reduce the R_0.[43-44, 46-47]
- Farms located near bodies of water, have large flock sizes, or are in an area of high farm density are at increased risk for HPAI.[48-49] Another important aspect of disease transmission is negligence, or the loose implementation of biosecurity and preventive measures combined with low levels of surveillance.[50-51]

Risk factors for human HPAI infection are direct contact with or close exposure to sick or dead poultry, or visiting a live poultry market.[52-5334, 51] 2021-2024 reports of confirmed human cases all involve close contact with poultry, infected dairy cattle during milking operations, or environmental exposure.[9]

- Generally, there is low risk of human infection.[54-55] HPAI viruses can be transmitted by direct contact and aerosol in mammals,[56-57] including aerosols generated during poultry slaughter.[58]
- H5N8 was detected in human poultry workers during an outbreak on poultry farms in Russia, although the humans did not have symptomatic disease.[59]
- There is no direct evidence that HPAI viruses are transmitted to humans via consumption of contaminated poultry products,[60] but there is evidence that other mammals have become infected after eating contaminated poultry meat and blood[61-63], or raw milk from infected dairy cattle.[64]
- The USDA and the FDA have assessed the risk of humans becoming infected with HPAI virus through contaminated cooked poultry meat, shell eggs, egg products, or pasteurized dairy products to be low.[65-66]
- Studies in both the U.S. and Canada testing retail dairy products have not detected infectious virus; however, HPAI RNA was detected in retail pasteurized milk in the U.S.[67-70]

Sustained transmission in mammal populations is uncommon.

- Although there are cases of mammalian host-to-host transmission of HPAI viruses,[71-76] sustained transmission is uncommon in mammals.[24]

- In October 2022, farmed mink were found to be highly susceptible to GsGd lineage HPAI H5N1 and a mutation in the PB2 gene that enhance the polymerase activity of influenza in mammalian cells. Mink-to-mink transmission was indicated to have occurred.[71]
- Human cases of H5N6 have occurred with severe disease and 55% fatality rates, but there has been no evidence of human-human transmission.[77]
- The USDA has noted spread of HPAI between cows, cows to poultry, and farm to farm spread associated with cattle movement.[78]
- Dairy cattle may be infected by HPAI genotype B3.13 via respiratory or mammary exposed routes; however, cattle appear to be more susceptible to mammary exposure and symptoms are similar to what is observed in infected cattle on dairy farms.[79-80]
- The FDA recommends that any discarded milk or diary product intended for animal consumption be heat-treated or pasteurized to prevent transmission.[81]

What do we need to know?

- What is the relative contribution of factors that influence transmissibility between farms (e.g., wild birds, shared farm equipment, human movement, livestock movement)?
- What is the typical generation time or serial interval for infections in poultry? For wild birds?
- Is transmission heterogeneous, in the sense that only a few animals contribute the most to new cases?
- What is the potential for HPAI viruses to transmit to and among humans and what is the likely route of transmission?

Host Range – How many species does it infect? Can it transfer from species to species?

What do we know?

Migratory aquatic birds are the primary natural reservoir for most subtypes of AIVs,[38] but domesticated poultry and other birds can also be infected.[75]

- HPAI virus has been found in gallinaceous poultry (pheasants, quail, guinea fowl), game birds, ducks, geese, ratites, pigeons, vultures, raptors, and passerines.[24, 75, 82-83]
- GsGd lineage HPAI H5N1 was initially detected in geese and emerged among poultry in China.[84-85]

Many animal species, including humans, are susceptible to AIVs, despite not being the primary reservoir hosts. The ongoing global HPAI outbreak has impacted wildlife at an unprecedented level with expansion of both the number and diversity of mammalian and avian species infected. Additionally, disease severity has been greater compared to other influenza viruses affecting wildlife.[12-13]

- Assessment of the ongoing HPAI outbreak revealed that by the end of 2023, there had been a minimum 2.8-fold expansion in mammalian species impacted and 2.2-fold expansion in wild bird species impacted compared to the onset of the outbreak in 2021.[12]
- The USDA tracks reports of HPAI in mammals during the ongoing U.S. HPAI outbreak, and as of 31 July 2024, HPAI H5N1 has been detected in over 350 samples. Species impacted include rodents, felids, canids, bears, seals, and dolphins. HPAI has most commonly been reported in red fox (96 detections), house mouse (82 detections), striped skunk (36 detections), and domestic cat (36 detections).[86]
- As of 31 July 2024, HPAI has been detected in 175 dairy herds in 13 states with Texas, Idaho, Colorado, Michigan, and Ohio reporting the highest number of affected herds.[7]

- Since March 2024, HPAI has also been detected in U.S. goats and alpacas in isolated cases.[87]
- Foxes have also tested positive for GsGd lineage HPAI H5 in Canada,[83, 88-89] East Asia,[90] and Europe.[91-94]
- There is evidence domestic cats and dogs have been infected with H5N1 in multiple locations, including Europe, Thailand, and North America.[62, 95-97]
- GsGd lineage HPAI H5N2 was recovered from a dog and was transmissible to other dogs, chickens, and cats,[75] and has been associated with multiple ostrich outbreaks.[98]
- GsGd lineage HPAI H5N8 has appeared in poultry, wigeons, mute swans, gyrfalcon, ostrich, penguins, wild waterfowl, domestic ducks, and pigs.[27, 98-103]
- GsGd lineage HPAI H5N6 has been isolated from pigs[75] and detected in wild birds.[104]

WHO has reported several human cases of HPAI H5N1 since 2003.[105]

- Since 2020 when H5N1 clade 2.3.4.4b emerged, there have been human case(s) reported in Laos, Ecuador, Australia, Chile, India, Spain, Vietnam, China, the U.S., the United Kingdom, and Cambodia.[105]

What do we need to know?

To better understand the risk of transmission to species other than birds, we need more information on the role of viral diversity on host susceptibility:

- What is the risk of human and animal infection and subsequent transmission due to natural diversity of H5N1 subtypes?
- What is the role of domestic animals in transmitting and maintaining H5N1?
- Will genotype B3.13 currently impacting dairy cattle lead to larger outbreaks in other mammalian species?

Incubation Period – How long after infection do symptoms appear? Are animals infectious during this time?

What do we know?

Birds generally exhibit clinical symptoms of infection such as coughing, sneezing, and nasal discharge hours to days after becoming infected with an HPAI virus, however they can shed HPAI virus during the incubation period prior to clinical signs.

- Incubation periods for HPAI vary and are dependent on infectious dose, transmission acquisition, and environmental factors. Determination of infection duration and incubation time is confounded when no clinical symptoms are present. Naturally infected chickens have an incubation period from 3-14 days.[106]
- In poultry, the incubation period can range from hours to days. For disease control considerations, a 28-day incubation period is used for avian populations.[107] Mammals are thought to have short incubation periods of 1-2 days.[75]
- The duration of infection depends on the host species, virus strain, and severity of infection.[75] Waterfowl can shed virus before clinical signs appear.[24, 75] Studies have found virus shedding in chickens and wild birds within 1-2 days following exposure.[108-109]

Humans infected with H5N1 AI generally show clinical symptoms 2-5 days after exposure, though longer incubation periods (≤17 days) are possible.

- For AIV (H5N1) infections in humans, incubation periods average 2-5 days after virus contact or contact with exposed live poultry, often being described as "within the week prior" [110-112,113] and while rare, on the high end can range from 8-17 days.[59, 75, 114] For human infections with the HPAI (H7N9) virus, incubation period ranges from 1-13 days,[75] with an average of 3-5 days.[111]
- There are limited examples of possible human-to-human transmission of HPAI[115] however in the few documented cases of likely spread, the incubation period was measured at 3-5 days, with one instance of an incubation period of 8-9 days.[116]

Initial reports of illness in dairy cattle indicated that the disease symptoms peak in about three to four days and lasts 10 to 14 days.[117]

- Herd level incubation is estimated to be variable and between 12 to 21 days.[118]
- Cows without signs of infection have been linked to spread of HPAI.[78]
- Cows exposed to genotype B3.13 via the mammary route showed clinical signs within 48 hours of infection similar to those observed on dairy farms, while cows exposed via respiratory route showed limited clinical signs of disease including increased nasal discharge 1 to 3 days d.p.i.[79-80]

What do we need to know?

- How infectious are individuals during the incubation stage relative to the symptomatic stage?
- Does the route of transmission for human AIV infections influence the incubation time?
- To inform sensitivity of diagnostic tests and improve modeling, to what extent is HPAI H5N1 shed during the incubation period?

Clinical Presentation – What are the signs of infected individuals?

What do we know?

HPAI and LPAI refer to high or low pathogenicity in chickens (respectively), not humans or other animals.[119]

- LPAI viruses can cause serious illness in humans, but generally not in chickens.[119] Clinical symptoms of LPAI in humans can include conjunctivitis, fever, runny nose, sore throat, cough, and severe respiratory symptoms such as pneumonia and respiratory failure, even death. Few cases are asymptomatic.[120]
- HPAI infected wild birds such as waterfowl or migratory birds are often asymptomatic, however recent surveillance shows the possibility that a clinical sign of HPAI infection in wild birds could be a reduction in the number of movements over a time period or decreased flight distance.[3]

HPAI can cause up to 100% mortality in infected chickens.[121] Clinical presentation in birds can include mild to severe respiratory disease signs as well as neurological issues, problems with egg production and formation, and even sudden death.

- Clinical signs of HPAI in birds can include common respiratory illness signs such as nasal discharge, coughing, sneezing, and general fatigue. More severe symptoms are facial swelling, comb and wattles turning blue,[122] green feces/diarrhea, loss of muscle control, involuntary muscle movements and spasms, immobility, death,[123] and egg abnormalities such as soft or misshapen eggs, reduced egg production,[124,125,75] or eggs without shells.[126] Mortality can occur without external clinical signs of infection,[35] and an increase in mortality within flocks is sometimes the only sign of this virus.[125]

- Raptors (e.g., eagles, hawks, and owls) can present severe neurologic symptoms from HPAI infections.[127]

Mammals infected with AIV often present with symptoms that are common for other diseases and infection can be fatal.[62, 95]

- Infected mammals can present with clinical signs often found in other diseases, including fever, coughing, lethargy, diarrhea, and weight loss,[95, 128-129] with neurological signs such as seizures, ataxia, or tremors also possibly occurring.[12, 130] Laboratory animal models show these clinical signs can range from mild to fatal.[128]
- HPAI infection in mammals has presented as neurological issues in several species including porpoises, grizzly bears, bush dogs, domestic cats, dolphins, and seals.[12, 89, 131-135]
- HPAI infection of marine mammals has been linked to mass mortality events.[12, 136]
- Symptoms of HPAI in cattle include decreased feed intake, altered fecal consistency, respiratory distress, and decreased milk production with abnormal milk (e.g., thicker, concentrated, colostrum-like milk), lethargy, dehydration, and fever.[137] Older dairy cattle appear to be more clinically affected with more severely affected lactation.[66]
- The American Association of Bovine Practitioners (AABP) has indicated that impacted herds can experience a loss of about 20% of milk production for 14 to 21 days.[117]

Humans infected with HPAI H5 virus generally exhibit acute illness including fever, upper respiratory tract symptoms, myalgia, and lower respiratory tract illness.[124] However, humans can present with more severe symptoms including pneumonia, gastrointestinal issues, encephalitis, septic shock, multi-organ failure, and even death.[59, 124]

- Fever is common, but not always present. The less common symptoms to be aware of include nausea or vomiting, diarrhea, or seizures.[138]
- A strong index of suspicion of human H5N1 virus infection is warranted with cases of rapid onset fever and respiratory illness after having exposures to potentially infected poultry.[52]
- Personnel involved in culling operations or others with close contact of known infected birds should monitor closely for neurological or respiratory symptoms, as well as conjunctivitis, for at least 10 days following the exposure.[139]

Prior to 2022, there were no confirmed HPAI H5 infections in humans in the U.S.,[124] though sporadic human infections have been reported in other countries (e.g., H5N8 in Russia,[140] H5N6 in China,[141] H5N1 in China,[142] Cambodia,[143-144] Chile,[145] Europe,[146] Ecuador, [147] Vietnam, Laos, Egypt, and Indonesia).[148] However, since April 2022, fourteen cases of H5N1 have been identified in the U.S.[149-150]

- The first U.S. patient was involved with culling infected poultry at a Colorado farm with confirmed H5N1 cases in the poultry. He presented with fatigue and was treated with antivirals and recovered without hospitalization, with no further spread to close contacts.[149]
- Four U.S. cases have been reported since April 2024 in patients in contact with infected dairy cattle.[150] Cases have been mild with two patients only presenting with conjunctivitis.[151]
- Nine U.S. cases have been reported since April 2024 in patients in contact with infected poultry.[150]
- The WHO tracks all human cases of H5N1, which as of 31 July 2024 includes data from 2003 through 19 July 2024.[105]

- Australia reported its first human case of AIV on 22 May 2024. H5N1 clade 2.3.2.1a was detected in a 2.5 year old child and is suspected to have been acquired while the child was in India.[152]

What do we need to know?

- To what extent have subclinical or asymptomatic HPAI infections been underreported in humans?
- Is there any discernable pattern based on timing or progression of symptoms that would allow farmers to recognize HPAI infections more quickly in their flocks?

Biosurveillance and Clinical Diagnosis – Are there tools to diagnose infected individuals? When during infection are they effective? Are there ongoing surveillance efforts to detect HPAIs?

What do we know?

The primary method of detecting AIV in poultry flocks and cattle herds is real-time reverse transcription polymerase chain reaction (rRT-PCR) from cloacal and oropharyngeal/tracheal swabs,[153] sampling from sick and dead birds,[154] manure,[155] sick cattle, and milk/udder secretions.[156]

- RT-PCR is used for evaluating the presence of HPAI in manure from commercial flocks,[155] and along with sequencing provide confirmatory testing for HPAI presence.[38] Validated RT-PCR assays allow for detection of HPAI H5 viruses and co- circulating LPAI viruses, and considerably reduce diagnosis times.[157]
- RT-PCR viral detection is typically possible within a few days of disease onset.[158]
- Both RNA and infectious virus are detected in raw milk collected from affected cows.[159]
- Pre-movement testing is required for all lactating cattle.[81, 160]
- Due to the multi-faceted nature of the spread of HPAI to cattle, response and monitoring is shared by the USDA, FDA, and CDC in the U.S.

Laboratory diagnoses also include immunodetection of virus antigen/antibody.

- According to the CDC and World Health Organization (WHO) guidelines, rapid antigen detection tests, such as immunofluorescence or enzyme immunoassay, should not be the diagnostic method of choice in the event of a suspected outbreak of AIV.[59, 161] Rapid antigen testing for HPAI is often falsely negative in confirmed cases.[158]
- Antigen detection is widely used globally for AIV identification in poultry flocks for early detection and containment initiation.[2, 162-163]

Migratory birds that travel long distances have a major role in the global spread of AIVs.[164]

- An important component of biosurveillance is wild bird carcass surveillance from target species.[165] In wild birds, passive surveillance (from dead birds) is an appropriate method for HPAI surveillance when HPAI infections are associated with bird mortality, whereas active surveillance (from live birds) has an extremely low efficiency for detecting HPAI virus.[166] The presence of important long-range HPAI vectors is generally seasonal, which should influence active sampling schemes to supplement passive sampling.[25]
- When positive cases of HPAI are detected in a country or region, surveillance protocols for wild birds should be initiated, as the movement of migratory waterfowl is considered a potential risk for virus transmission into non-infected areas.[163]

- Characterizing local bird communities and their compositions can help determine which species are likely to come into contact with local poultry farms. This data can help streamline surveillance and management techniques during HPAI outbreaks.[167]

Monitoring for HPAI is conducted by the USDA in the U.S., as well as by international partners in their respective regions.

- The U.S. Geological Survey National Wildlife Center in Wisconsin conducts enhanced HPAI surveillance and has identified lethal HPAI infections in diverse raptor populations.[168] USDA APHIS performs AI surveillance in migratory birds.[82, 169] WHO continuously monitors AIV and other zoonotic influenza viruses through its Global Influenza Surveillance and Response System, and in collaboration with the World Organisation for Animal Health (WOAH) and the Food and Agriculture Organization (FAO), conducts human-animal surveillance.[59]
    - USDA, together with the Center for Food Security and Public Health, implemented a biosecurity resource based off of the Checklist for Self-Assessment of Implementing Poultry Biosecurity as part of initial response.[170]
    - Appraisal and Indemnity resources are available for backyard flocks affected by HPAI.[171]
- Wild bird LPAI/HPAI viral sampling is primarily from several genera from the family Anatidae.[172] USDA determines which watersheds to conduct virus surveillance.[172]
- The National Wildlife Disease Program (USDA/APHIS/Wildlife Services) monitor HPAI in mammals across the country.[86]
- The 25 member nations in the Global Consortium for H5N8 and Related Influenza Viruses monitor global circulating AIVs.[164] Similarly, 31 European countries routinely sample commercial and backyard poultry flocks, as well as wild birds for circulating LPAI and HPAIs.[173] This type of surveillance can help establish, for instance, whether new genomic variants likely arose from locally circulating strains, or whether they were imported from other sources.[174]
- Coinciding with HPAI infections of dairy cattle, H5 markers have been detected in nearby wastewater plants that permit discharge of animal waste, including milk byproducts.[175]
- Researchers are developing open platforms that helps to eliminate barriers to access of HPAI outbreak information and enable policymakers to rapidly respond to outbreaks, conduct investigations, and communicate risk information to the public.[176]

What do we need to know?

- How effective are methods for identifying LPAI with the potential to develop into HPAI?
- What is the most effective approach to conduct surveillance in dairy herds and in dairy workers?

Veterinary Medical Countermeasures – Are there effective treatments?

What do we know?

In the U.S., the primary method of HPAI virus control and eradication in poultry is depopulation, rather than use of veterinary countermeasures to treat infected animals.[106]

- USDA instructs responsiveness to HPAI virus by isolating and depopulating an infected population. In extreme cases, emergency vaccinations can be administered to the animals.[106]

There are several medications available that reduce clinical signs and potential for transmission in infected poultry,[177] though they are not used in the U.S..

- Experimental intranasal infections in chickens with HPAI H5N6 were treated with oral baloxavir or peramivir either immediately or 24 hours post-challenge. Only those chickens treated immediately post-challenge with baloxavir showed significant reduction in viral titers and protection from death.[178]
- Oseltamivir reduced mortality and transmission when administered to chickens infected with HPAI H5N2, but transmission resumed once antiviral treatment ended.[179] Zanamivir was ineffective at reducing HPAI mortality or transmission between chickens.[179]
- Resistance to amantadine has been resolved to a single mutational polymorphism that is present in AI H5N1 and H7N9 subtypes.[180-181] Experimental studies using site-directed drug development have shown that M2-inactivation drugs can still be used against resistant strains and remain viable future treatment options.[180-181]

Vaccination efficacy is typically limited to the same subtype and clade; however, it is a strategy that can be used alongside other methods to control and prevent the spread of AIV.[182]

Palliative care is recommended for infected cattle.[81]

What do we need to know?

- Are there effective measures for reducing viral load in infected poultry aside from vaccines?
- Are there effective measures for reducing or preventing disease in infected livestock?
- Can currently resistant strains of influenza develop additional resistance to existing treatments for animals?

Human Medical Countermeasures – Are there effective treatments?

What do we know?

For humans with confirmed or suspected novel influenza, antiviral drugs may be used for treatment and prophylaxis if given early in symptom progression or before symptoms begin.

- There is no clinical trial data for use of antivirals in human cases of novel influenza.[183]
- Humans with confirmed or suspected novel influenza should be given neuraminidase inhibitor drugs (e.g., oseltamivir, peramivir, and zanamivir) for treatment.[183]
- In a small sample size, baloxavir as an alternative to oseltamivir was efficacious as an antiviral treatment for people with H5N6 infections.[184]
- Phenotypic testing of 22 clade 2.3.2.1a and 2.3.4.4b viruses revealed broad susceptibility to neuraminidase inhibitor drugs and baloxavir concluding that most contemporary HPAI A(H5N1) viruses retain susceptibility to antiviral drugs.[185]
- Household or close family members with highest risk of exposure to individuals having confirmed influenza caused by H7N9 or H5N1 viruses should be given oral oseltamivir or inhaled zanamivir as chemoprophylaxis within 48 hours of exposure to reduce likelihood of additional transmission.[186]
- Some HPAI strains (H7N9, H5N6, and H5N1) are resistant to antiviral medications amantadine and rimantadine, which should not be used.[183]
- The anti-influenza drug, favipiravir, a chain terminator of viral RNA only approved for use in Japan.[187]
- Purified antibodies against H5N1 have been tested in animal and small human trials and appear safe, with some efficacy in *in vitro* studies.[188-189]

What do we need to know?

- What alternatives can be developed if antiviral resistance becomes widespread?
- Can current therapeutic options be modified to counter resistance to amantadine class drugs?

Vaccines – Are there effective vaccines?

What do we know?

Globally, there are several existing vaccines against AIV in poultry, though their use is not consistent across impacted countries.[190] USDA maintains emergency poultry vaccination guidelines, procedures, and vaccine recommendations.[106]

- One complication in vaccination campaigns is vaccinated birds become difficult to differentiate from infected birds.[191-192]
- The role of vaccines in the prevention and control of HPAI is a topic being actively explored,[193] with the European Council releasing a press release in May 2022 regarding the decision by the agriculture ministers on a strategic vaccination approach.[194] Vaccination has often been thought of as a last resort, but the 2021-2024 epidemic is causing countries to debate revising their vaccination strategies.[195-196]
- An International Alliance for Biological Standardization international meeting was held in October 2022 to discuss challenges and barriers to AIV vaccine use, such as trade concerns and availability of suitable vaccines, and recommendations have been made to support greater use of vaccination to help control the spread of HPAI.[197]
- Due to the 2023 spread of HPAI within the U.S., in April 2023 the USDA began HPAI vaccine trials of four candidates to test their efficacy in poultry against GsGd lineage H5N1 clade 2.3.4.4b, the strain causing the current outbreak.[198-199]
- Vaccines used in birds are either “homologous,” (the HA and subtypes both match the virus to be protected against), or “heterologous” (where the NA subtype differs). For all inactivated AIVs, the HA vaccine strain subtype needs to match the wild virus strain HA subtype. Heterologous vaccines are most often used for HPAI, and permit differentiation of birds infected with vaccine or field strains.[190]
- A 2024 meta-analysis focusing on vaccine studies from 2010-2023 concluded the following efficacies:[200]
  - Inactivated vaccines: efficacy of 95% against homologous strains and an efficacy of 78% against heterologous strains.
  - Live recombinant vaccines: overall efficacy of 97%.
  - Inactivated recombinant vaccines: overall efficacy of 90%.
  - Commercial vaccines: overall efficacy of 91%, with 96% efficacy against homologous strains and 90% efficacy against heterologous strains.
- Significant antigenic differences between commercially available poultry vaccines and currently circulating HPAI viruses suggests that vaccines may be suboptimal in controlling current poultry outbreaks.[201]
- Vaccines have historically been used to help control outbreaks of HPAI in poultry flocks in Mexico, Pakistan, Egypt, Indonesia, Vietnam, and China.[190, 202-203]
- Eradication of HPAI through vaccination campaigns, in coordination with other measures, has occurred in a few countries, and typically where either a high level of competence in

veterinarian services exists, or where the geography and density of bird populations have helped lead to the success.[192]

- After 19 critically endangered California condors were found dead due to HPAI infection, APHIS approved the emergency use of an HPAI vaccine. Vaccination will be limited to the condors, which are wild birds and not poultry, so it will not impact trade.[204-206]

There are multiple vaccines for use in humans for protection against H5N1, however they have typically been developed for the Strategic National Stockpile or for pandemic preparedness and are not produced in large quantities nor available for general population use.[207]

- The human seasonal flu vaccines do not protect against AIV H5N1.[208]
- The CDC, in coordination with the WHO, developed a curated bank of Candidate Vaccine Viruses (CVVs) that are a library of influenza viruses, including both seasonal and HPAI influenza viruses, which can be used for expedited development of human vaccines if needed. The CVV library contains virus nearly identical to H5N1 clade 2.3.4.4b.[208-212]
- The U.S. Government, Biomedical Advanced Research and Development Authority (BARDA), is working with multiple vaccine manufacturers, to test the safety of H5 vaccine candidates similar to the current outbreak strains.[213]

AIV vaccines for birds do not prevent infection but reduce clinical signs and mortality. Vaccinated birds can still transmit infection to other birds, albeit at a lower rate than unvaccinated birds.

- HPAI vaccination of ducks and poultry may reduce virus shedding following challenge with GsGd lineage HPAI virus.[214-215]
- Benefits of vaccination are extremely limited for short-lived poultry such as broiler chickens.[216]

Vaccines exert selective pressures on AIVs,[217] hastening evolution and vaccine resistance.[218]

- Antigenic drift in Egypt has reduced the efficacy of an existing H5N2 vaccine against circulating HPAI H5N1 strains.[219]
- Similarly, researchers have found novel HPAI H7N9 strains in China have the ability to partially escape neutralization by vaccines, with those vaccines introduced only 6 months prior,[220] which is suggestive of rapid evolution due to vaccine-induced selective pressures. The control of H5N1 in China has resulted in seven different vaccines being introduced over a 10-year period.[192]
- The WOAH's General Assembly debated the use of vaccination as a complementary tool and extensively discussed its associated implementation challenges.[221] It was recognized that a successful vaccination strategy must rely on authorized vaccines that closely match the virus strains in circulation. Furthermore, it must be accompanied by robust disease surveillance, which is able to demonstrate freedom from infection in the domestic animal population as recommended by WOAH Terrestrial Animal Health Code.[221]

What do we need to know?

- For increased resistance to infection as the influenza strains change over time, and reduced time for production of new strain specific vaccines, could a "universal" AIV vaccine be developed?

- How effective is prophylactic vaccination at reducing depopulation needs? (To understand the cost and risk benefit of vaccination versus mandatory culling if a farm's flock becomes infected).
- Should vaccination of high-risk poultry and livestock workers be implemented?
- Is vaccination an effective approach to protecting dairy cattle from AIV infection?

Depopulation / Carcass Disposal – What are safe and effective ways to minimize the spread of HPAI in agricultural settings?

What do we know?

Within 24-48 hours of HPAI notification on farms, the USDA defined standard practice for commercial poultry is depopulation with water-based foam systems (e.g., National Veterinary Stockpile Kifco Avi-Guard, or Spumifer handheld nozzles) for floor-raised birds or gassing (e.g., carbon dioxide, carbon monoxide, argon, or nitrogen) for caged birds. These processes are generally safe and effective, and gassing is identified as an accepted practice for euthanasia by the American Veterinary Medical Association (AVMA),[222] though efficacy depends on poultry species.[223-224]

- Efficacy of foam versus gassing for depopulation is species-dependent. While water-based foam (Spumifer with 1% Phos-Chek and water foam) resulted in more rapid brain death in turkeys,[225-226] 100% CO_2 gas outperformed water-based foam in four physiological categories (time to unconsciousness, motion cessation, brain death, and altered terminal cardiac activity) in ducks.[226-227]
- Gas concentration in depopulation is also species-dependent; 40% CO_2 concentrations are effective euthanasia for chickens within 2-4 minutes, although >70% concentration is required for ducks and geese.[222-223]

Alternative methods such as Ventilation Shut Down (VSD) are conditionally approved as adjunct methods by USDA, but must meet additional policy requirements before use.[224]

- VSD is considered a controversial practice by some veterinarians.[228]
- Continuing research shows improvement of VSD efficacy with addition of supplemental heat.[229-231]

USDA disposal methods include composting, burial, incineration, rendering, and landfilling.

- The disposal method to be used is selected by the disposal group comprised of federal partners and incident command staff based on several considerations.[232]
- Research indicates increasing temperature from 35°C to 55°C during carcass composting reduces the time required to achieve greater than 99.999% reduction in viral activity from 6.4 hours to 29 minutes.[233] USDA suggests maintaining a temperature of 135-140°F for 3-12 weeks to ensure full decomposition.[232]

Early influenza virus detection and reporting and time to depopulation directly impacts the spread of HPAI and successful containment. On average, 12 days are needed for on-site staff to recognize illness and initiate reporting.[234-237]

- Expedited bird depopulation can greatly reduce HPAI spread.[223, 236, 238-239]
- Reporting delays can result in increased culling.[237]
- Geographic containment zones are established immediately upon HPAI notification per USDA guidance control strategies.[232]

- Depopulation or carcass disposal strategies have not been determined for migratory and wild birds, but USDA recommends separating and securing water, food and other materials in locations difficult for wild birds to access.[240]
- Machine learning is being considered to pre-emptively identify quarantine and culling zones.[241]

USDA APHIS does not currently recommend depopulation of cattle. Infected livestock should be monitored for disease progression and supported with palliative care. Return to the herd should be determined with the assistance of veterinarians.[81]

What do we need to know?

- What are the current barriers to on-site recognition of illness and initiation of reporting?
- What is the risk of on-site handling procedures during culling and disposal for accidental contamination?
- Would further evaluation of alternative depopulation methods provide time-savings, efficacy, or cost burden benefits?
- What is the most effective approach to contaminated milk disposal?

Viral Persistence and Environmental Stability – How long does the virus live in the environment?

What do we know?

Avian influenza virus persistence varies based on the environmental matrix and exposure to natural environmental factors (heat, ultraviolet [UV] exposure, salinity, and pH).

- Avian influenza virus can persist in aerosols for 24-36 hours, which is longer than human influenza viruses (6-15 hours).[242] [243-244]
- The duration of AIV virus persistence decreases with increasing temperature.[245-250] Survival rates at 4ºC, 20ºC, and 30ºC in saline solution were measured to be 3213 at 4°C, 293 at 20°C, and 58 days at 30°C.[246]
- UV light exposure for 30 minutes and pH of less than 2 for 30 minutes have been shown to inactivate H7N9.[249]

AIVs are extremely stable in water, showing infectivity after several months in cold weather natural wetlands.

- Using a combination of field-and laboratory-based approaches, five subtypes of AIV were found to be infectious after at least 7 months in Alaskan and Minnesotan wetlands,[251] suggesting a key source of natural infection in waterfowl.
- Eurasian HPAI H5N1 showed persistence in water similar to several LPAI strains,[252] though HPAI persistence depends on the specific strain.[253] All avian influenza viruses appear more stable in cooler, less acidic water with low salinity.[252, 254-255]
- HPAI H5N1 viruses were used to experimentally inoculate artificial aquatic biomes. Infectious virus was only recovered from rainwater 4 days post-contamination at 25°C. Infectious virus and viral RNA was detected in few cases in the aquatic fauna and flora, especially in bivalves and labyrinth fish.[256]
- The infectivity of 12 Influenza A viruses that were isolated from naturally infected ducks were monitored for approximately one year. A single replicate from two viruses tested remained viable for 361-377 days post-sample collection when maintained in surface waters under ambient temperatures.[257]

- HPAI viruses are relatively stable in duck feathers,[245, 258] maintaining infectivity for up to 160 days in experimental trials.[245]
- AIV viruses may remain stable in duck or poultry feces for days to weeks.[245, 247-248]

Influenza A virus surface persistence is dependent on the surface, strain, and environmental conditions.

- Influenza viruses may remain viable on non-porous surfaces (stainless steel) for up to two weeks.[259]
- AIV persisted for 24-72 hours on non-porous surfaces such as stainless steel and plastic, and for <8-12 hours on cloth, paper, or tissues.[260-262]
- AIV H13N7 infectivity persisted for ≥6 days on latex and feathers; ≥3 days on steel, tile, rubber gumboots, rubber tires, egg shells, and plastic; ≥2 days on wood; ≥1 day on cotton fabric; and ≤1 day on egg trays and polyester fabric.[263]
- In poultry litter, HPAI can persist for up to 60 hours compared to 24 hours for LPAI.[264]

HPAI maintains infectivity in fresh and frozen poultry products, creating a potential importation hazard.

- H7N9 on raw chicken remained viable at -20°C for 9 days, 4°C for 7 days, and 25°C for 4 days; therefore, H7N9 on raw chicken could be a potential source of transmission domestically and internationally.[265]

The stability of HPAI in unpasteurized dairy products and on milking equipment is not well understood.

- Initial studies indicate that H5N1 genotype B3.13 persists in milk on stainless steel milking equipment for over an hour and on rubber components for over 3 hours.[266]

What do we need to know?

- How long does infectious virus persist on dairy milking equipment?
- How long does infectious HPAI persist in unpasteurized dairy products?
- How long do HPAI strains maintain infectivity in frozen poultry carcasses?

Decontamination – What are effective methods to kill the agent in the environment?

What do we know?

The U.S. Environmental Protection Agency (EPA) maintains a list of registered chemical compounds for use in disinfection against avian influenza on farm settings, including bleach, alcohol, and quaternary ammonium-based compounds.[267]

- The EPA's List M for registered antimicrobial products with label claims against AI: List M: Registered Antimicrobial Products with Label Claims for Avian Influenza | U.S. EPA.[268]

USDA APHIS maintains protocols for cleaning and disinfection of facilities affected by HPAI, and decontamination is a crucial component of HPAI response. HPAI-affected farms must undergo cleaning and removal of bulk debris, followed by disinfection by drying and heating (100-120°F for 7 days) or wet disinfection with an approved product, and fumigation if needed.[269]

- During 2014-2015 outbreak, APHIS found that dry cleaning and heat disinfection of barns was most cost- and time- effective.[270]

- Sodium bisulfate is used to acidify poultry litter, and is largely effective at inactivating LPAI within 36 hours.[264] Acidification (exposure to pH 1 or pH 3 for 6 hours) is known to inactivate low levels of HPAI (H5N1) when suspended in peptone water.[250]
- Soap, detergent, and alkali (Surf Excel®, Life bouy®, and caustic soda) at 0.05% concentration at 28°C was not sufficient in destroying H5N1 virus, but increasing concentrations above 0.1% inactivated the virus after 5 minutes contact time at 28°C.[250]
- Chemical disinfectants (formalin, iodine crystals, phenol crystals, CID 20, Virkon-S, Zeptin, KEPCIDE 300, and KEPCIDE 400) can inactivate H5N1 at the recommended concentrations at 28°C.[250]
- Burning of contaminated poultry carcasses, litter, and feed in pyres or incinerators is another option for the decontamination and disposal of large amounts of contaminated waste resulting from HPAI outbreaks, if other methods are not feasible.[106, 271]

For facilities that cannot be adequately cleaned and disinfected, a fallowing period (allowing to lie dormant and unoccupied) is required.[269]

- The fallowing period is typically 120 days, but is dependent upon temperature and season.[269] Rapid depopulation to allow for a fallow period can prevent millions of U.S. dollars in lost profits.[272]

Various decontamination methods have been evaluated for poultry and cattle products to control the spread of AIV.

- According to USDA, AIVs can be inactivated in egg products and poultry meat by heating processes (e.g., 60ºC for 188 seconds for whole eggs, 65ºC for 42 seconds for poultry meat).[106]
- The guidelines provided by USDA Food Safety and Inspection Service time and temperature for cooking chicken meat to achieve a 7-log reduction of *Salmonella* is also applicable to AIV strains. AIV strains including HPAI were effectively inactivated in chicken meat held at 70 or 73.9°C for less than 1 second.[273]
- Pasteurization temperatures of both 63°C and 72°C rapidly and effectively inactivated influenza viruses in milk.[274] The FDA "does not currently have concerns about the safety and availability of pasteurized milk products".[66]
- USDA has concluded that there is no risk from beef cooked to 145 – 160°F.[275]
- The FDA and USDA recommend that any discarded milk should be heat-treated or pasteurized before disposal and that milk producers consult their respective State regulatory officials for any state-specific requirements.[81]

What do we need to know?

- What are additional cost-effective means of HPAI poultry virus decontamination?
- What are the risks of reinfection given different means of decontamination?
- What are the most effective means of decontamination for milking equipment and meat processing equipment?

Personal Protective Equipment (PPE) – What PPE is effective and who should be using it?

What do we know?

There is effective PPE for those with potential exposures to HPAI, with the recommended type of PPE dependent on the type of exposure (e.g., poultry workers, laboratory staff, depopulation workers).

- The greatest risk for AIV infection are those who have direct physical contact or close proximity (2 meters) to infected birds, contact with contaminated surfaces, or at a live poultry market.[276] In addition to frequent handwashing, PPE must be used when in direct contact with possible infected birds as wells poultry carcasses, poultry feces or litter, or when entering any premises with diseased or dead poultry.[276]
- Current CDC HPAI H5 or H7 virus human exposure monitoring guidance for avian outbreak responders: self-reporting illness (passive monitoring) for those wearing adequate PPE. For those with inadequate or lacking PPE, active disease monitoring is advised. For those responding to an AIV of unknown origin, active monitoring during exposure and continuing for 10 days post-exposure are recommended, regardless of PPE use.[277]

Recommended PPE for poultry workers includes safety goggles, disposable gloves, boots, a respirator (NIOSH-certified at N95 or higher), apron, disposable head/ hair cover, and disposable fluid-resistant coveralls.[276]

- Respirators should be used in a comprehensive respiratory protection program in accordance with the Occupational Safety and Health Administration (OSHA) Respiratory Protection standard (29 CFR 1910.134) and other requirements. Staff required to wear N95 (or higher) respirators require medical clearance, training, and fit-testing for respirator use.
- Reusable PPE (e.g. rubber boots, rubber apron) should be cleaned until visible dirt is removed, and then disinfected with an EPA approved disinfectant.[276]
- Poultry workers involved in depopulation should wear full PPE consisting of lightweight, disposable or heavy-duty rubber work gloves that can be disinfected, disposable outer garments, coveralls or surgical gowns with long, cuffed sleeves and a sealed apron, disposable shoe covers or boots that can be cleaned and disinfected, safety goggles and disposable head/hair cover, and an N95 or higher respirator.[278]
- To reduce risk of HPAI virus infection, landfill workers having contact with AIV-infected carcasses or potentially infected materials should use appropriate PPE when disposing of poultry carcasses during HPAI outbreaks,[276] including disposable gloves, boots, protective disposable fluid-resistant coveralls, goggles, and a NIOSH-certified respirator (e.g., N95 or higher) when in direct contact with infected birds, poultry carcasses, and/or poultry feces or litter.[276]

Recommended PPE for laboratory workers depends on the purpose of the work, the biosafety level of the laboratory, and the country of operation.

- Laboratory research with HPAI requires development and implementation of a written biosafety plan is proportionate to the risk of the select agent (9 CFR §121.12(a)).[279-280]
- Biosafety Level-2 (BSL-2) Laboratories: Laboratories such as veterinary diagnostic laboratories conducting routine screening surveillance on samples collected from wild birds and domestic poultry. In the U.S. and regions known to be HPAI-free, these are considered low-risk materials, and this work can be conducted in a BSL-2 laboratory.[281] Personnel are required to use , disposable gloves, laboratory coat, eye protection.[280]
- Biosafety Level-3 (BSL-3) Laboratories: In addition to standard BSL-2 practices, the following additional PPE and laboratory practices are used: powered air-purifying respirators, protective suit (e.g., wrap-back disposable gown, protective suit, disposable Tyvek gown), and double disposable gloves. For research with mammalian-transmissible HPAI viruses, disposable sleeves are worn over the gown while working in a biosafety cabinet, as well as shoe coverings (e.g., double disposable shoe coverings; single

disposable shoe coverings if worn with footwear dedicated to BSL-3 enhanced laboratory use, or impervious boots or shoes of rubber or other suitable material that can be decontaminated), and protective eyewear.[279-280]

- Biosafety Level-4 (BSL-4) Laboratories: Additional measures beyond the facility requirements for BSL-3 are not needed. The BSL-3 criteria are sufficient for appropriate HPAI biocontainment.[279]
- A cross-contamination event occurred in 2014 at the CDC between LPAI H9N2 (non-select agent) and HPAI H5N1 (select agent) viruses. Because proper biocontainment and PPE procedures were followed, the virus remained contained and no illness or injury occurred.[282]
- Those visiting a HPAI infected herd should refer to the USDA APHIS recommendations and follow any additional PPE recommendations of the local Incident Commander and Safety Officer.[283]

What do we need to know?

- Are PPE stocks sufficient in the event of a large-scale outbreak or multi-species outbreak?

Genomics – How does the disease agent compare to previous strains?

What do we know?

AI viruses are defined by the presence (HPAI) or absence (LPAI) of a polybasic cleavage site in the HA gene.

- LPAI viruses contain HA proteins that can only be cleaved (required for cell entry) by a limited number of enzymes; however, HPAI viruses contain HA that can be cleaved by a broader set of enzymes.[284] The transition from LPAI to HPAI can occur from mutations at the cleavage site during circulation of the virus in natural hosts, and these transitions can be documented by identifying the LPAI ancestors of HPAI strains in phylogenetic studies.[285]
- Between 1959 and 2019, there have been 42 observed transition events from LPAI to HPAI in H5 and H7 AIs.[284] While most led to restricted outbreaks, several, including H5 HPAI, continue to cause outbreaks in poultry.[284]
- Interspecies transmission of HPAI was enhanced through genetic reassortment of H5N8 with a North American avian origin LPAI virus resulting in the generation of H5N2 HPAI virus responsible for the outbreaks in Canada and the U.S. in 2015.[286]
- The high mortality of GsGd lineage HPAI H5N8 clade 2.3.4.4b virus in ducks is associated with a number of genome segments, not just HA,[27] and amino acid substitutions in polymerase genes have also been linked to elevated mortality.[26]

As with all influenza viruses, evolution of HPAI viruses is rapid, which contributes to the diversity of these viruses.

- The nomenclature for variants is complex and requires continuous revision. The H5N1 Evolution Working Group was established in 2007 to develop a unified nomenclature.[287] An influenza clade or group is an additional classification beyond subtypes or lineages. For GsGd lineage HPAI H5, several viral clades have been identified (0 to 9), with respective hierarchical orders denoted using decimals. For example, subclades 2.2 and 2.3 are genetically similar and part of clade 2, and 3rd and 4th order subclades (e.g., 2.3.2 and 2.3.2.1, respectively) denote further genetic variation within the subclade 2.3.[288]
- Since at least 2014, most of the continuously evolving and circulating GsGd lineage HPAI H5 variants have belonged to clade 2.[288-291]

- As of 20 June 2024, GsGd H5N1 clade 2.3.4.4b viruses have been detected on all continents except Oceania[292-293] (i.e., detected in Europe,[126] Asia,[294] Africa,[295] North America,[3] South America,[296-298] and Antarctica[299-300]). Other HPAI viruses have been identified in Oceania and as of 22 May 2024 this is an active outbreak of HPAI H7 strains in Australia.[301]
- The geographic spread of AIV has been reflected in reported human cases across the globe.[302]

Exchange of genetic material among co-circulating AI strains is a primary driver of evolutionary change.

- H5 AIVs (H5N1, H5N2, H5N6, and H5N8) infecting wild birds in China acquired different NA types through reassortment with other strains (H3N2, H6N6, H3N8).[303] HPAI H5 clade 2.3.4.4b reassortant viruses were detected in wild birds in The Republic of Korea in 2022.[304] Similarly, sequencing of strains from the Czech Republic showed a high propensity of HPAI H5 to reassort with LPAI strains.[305]
- AI viruses circulating in wild birds have extensive reassortment, rather than more stable, isolated evolutionary lineages,[306] suggesting that outbreaks of novel avian influenzas in wild birds may be related to the timing of reassortment events in natural populations.[307]
- The global diversity of HPAI viruses is not fully characterized, but the GsGd lineage HPAI H5Nx lineage is known to frequently reassort and have a relatively high evolutionary rate compared to LPAI resulting in high virus diversification.[119]
- Evidence suggests that control measures, primarily in China, aimed at reducing the global spread of GsGd lineage HPAI H5N1 may have facilitated the emergence of novel H5Nx lineages.[308]

While rare, human cases of HPAI may increase due to new mutations in circulating viruses. There is concern that GsGd lineage HPAI H5 viruses will gain human-to-human transmissibility.[309]

- The receptor binding preference could influence the probability of spillover events from avian species to humans. Avian-lineage influenza viruses differ from human-lineage influenza viruses in that they generally prefer to bind different sialic acids on cell surfaces, but adaptations and mutations have been documented in H5N1, H7N2, and H9N2 avian-lineage isolates recovered from humans.[310]
- Mutations to gene segments (HA) have been associated with increased affinity for human type receptors as opposed to avian type receptors. Mutations in other gene segments (PB2, M1) have been shown to enhance replication in mammalian cells.[92, 305, 311-312] PB2 mutations continue to be detected in viruses isolated from infected mammals.[93-94, 97, 313]
- Circulating viruses are often screened for mutations known to reduce efficacy of antivirals. Clade 2.2 viruses appear to retain susceptibility to neuraminidase inhibitor drugs and baloxavir.[185] However, novel mutations have been identified in these viruses that reduce susceptibility to adamantane, oseltamivir, baloxavir, zanamivir, or peramivir.[185, 314-316]

HPAI H5N1 Clade 2.3.4.4b, genotype B3.13 is associated with outbreaks in U.S. livestock.

- Viruses isolated from infected dairy cattle are from the 2.3.4.4b clade but belong to a new genotype, B3.13. B3.13 viruses have mutations in HA, M1, and NS genes but do not have mutations in PB2 or PB1.[317]

- The respiratory tract and mammary tissues of dairy cattle express the AIV-specific receptor sialic acid α2,3-gal.[318]
- AIV from the HPAI positive patient in Texas was closely related to isolates from Texas dairy cattle as well as wild birds. Overall, it was concluded that the virus lacked changes that would indicate adaptation to human or mammalian hosts. However, the isolate has a mutation in PB2, which has been associated with adaptation to mammalian hosts.[319]

What do we need to know?

- What biological factors influence spillover probability?
- What factors lead to LPAI viruses becoming HPAI viruses?
- What fraction of the global genetic diversity of HPAI poses a threat to human and animal health?
- How can we predict which HPAI viruses pose a pandemic threat?
- What conditions favor genomic reassortment between HPAI H5 viruses?

Virus Importation – What are the main routes of entry into the United States? Are there effective mitigation strategies to limit HPAI importation?

What do we know?

Importation predominately occurs via close interactions between wild migratory birds and domestic poultry,[320,321] though other sources may also play a role.

- Modeling suggests that wild bird migration and illegal poultry trade are primary forms of HPAI introduction, and that the legal poultry trade is not a major importation risk.[164]
- Some outbreaks in domesticated poultry[322] have been linked to imported contaminated carcasses, as imported HPAI can maintain infectivity in fresh[323-324] and frozen poultry products.[322-323]
- HPAI H5N1 outbreaks with novel genetic mutations have recently occurred in farmed American mink, suggesting that both imported and domestic mink farming are potential sources of HPAI importation.[71, 325]

HPAI outbreaks are associated with wildfowl migratory seasons and routes.[326]

- Northern Mexican poultry farms have experienced HPAI H7N3 outbreaks occurs since 2012, which may be a risk to U.S. poultry.[327]
- Korea appears vulnerable to HPAI outbreaks due to the East Asian-Australasian migratory flyway for waterfowl.[328-329]
- Phylogenetic analysis revealed two main pathways into Europe,[330] including spread from central Asia.[331-332]
- In 2014, clade 2.3.4.4 H5N8 HPAI viruses spread across Korea and to China, Japan, Russia, and Europe, and were eventually discovered in wild birds in Canada and the Northwestern U.S. from wild waterfowl in the Pacific Flyway.[333-334]
- GsGd lineage HPAI H5 clade 2.3.4.4b viruses are currently circulating in wild birds in the U.S..[82] Migration studies indicate that this virus has been imported into the U.S. across the Atlantic ocean via Iceland, Greenland/Arctic and/or pelagic routes.[4] Bird banding data showed widespread movement of waterfowl within the Atlantic Flyway and between neighboring flyways and northern breeding grounds.[335]

- There is an extremely low risk that HPAI could be transmitted to domestic poultry from corn or feed contaminated by feces of infected wild migratory birds.[336] Nevertheless, securing poultry food bins and cleaning up wasted or spilled feed is recommended.[337]

After importation, spread can be rapid,[338] and losses to poultry flocks and the economy can be severe.[334]

- The 2014-2015 HPAI H5 outbreak affected 21 Western and Upper Midwestern States and had a $3.3 billion impact on the economy.[334]

Movement and trade of livestock within the U.S. is encouraged to be minimized at this time and should not occur if any cattle or other animals on the premises display disease symptoms. Pre-movement testing is required for all lactating cattle and a 30 day quarantine is recommended after arrival of dairy cattle.[81, 160]

What do we need to know?

- Illegal poultry trade contributes to importation and spread of HPAI. How can illegal poultry trade be addressed to reduce the risk of HPAI importation?
- How will interstate and international trade of livestock impact the spread of genotype B3.13 HPAI?

Definitions of Commonly Used Acronyms and Names

Acronym/Term	Definition	Description
AABP	American Association of Bovine Practitioners	N/A
AIV	Avian Influenza Virus	Virus responsible for causing avian influenza
APHIS	Animal and Plant Health Inspection Service	N/A
AVMA	American Veterinary Medical Association	N/A
BARDA	Biomedical Advanced Research and Development Authority	N/A
BSL	Biosafety Level	N/A
CDC	Centers for Disease Control and Prevention	N/A
Clade	Closely related viruses based on the similarity of their HA genes	Influenza A virus subtypes are based on two proteins on the surface of the virus: hemagglutinin (HA) and neuraminidase (NA). Subtypes are further divided into clades, which are based on the genetic similarity of the HA gene.
CVV	Candidate Vaccine Viruses	N/A
d.p.i.	Days Post-Infection	N/A
DHS S&T	U.S. Department of Homeland Security	N/A
EID_{50}	Median egg infectious dose	The dose at which 50% of the inoculated eggs become infected. Used as a standard measure of infectivity.
EPA	U.S. Environmental Protection Agency	N/A
FAO	Food and Agriculture Organization	N/A
FDA	U.S. Food and Drug Administration	N/A
GsGd lineage HPAI	A/Goose/Guangdong/1/96 (GsGd) lineage of HPAI H5 virus	GsGd lineage HPAI circulates in waterfowl and other migratory wild birds as HPAI. This lineage is unique as other HPAI viruses typically emerge from LPAI after replication in a domestic poultry species.
Hemagglutinin (H or HA)	A glycoprotein found on the surface of cells and viral envelopes	Hemagglutinin on the surface of influenza binds to sialic acid to facilitate importation of the virus.
HID_{50}	Median Human Infectious Dose	The dose at which 50% of humans become infected. Used as a standard measure of infectivity.
HPAI	Highly Pathogenic Avian Influenza	Disease caused by a highly pathogenic avian influenza virus
ID_{50}	Median Infectious Dose	The dose necessary to infect 50% of the target population (e.g., birds). Generally, assumes typical, healthy, adult individuals.
LPAI	Low Pathogenicity Avian Influenza	N/A
MQL	Master Question List	N/A

Acronym/Term	Definition	Description
Neuraminidase (N or NA)	An enzyme that cleaves neuraminic acids	Newly replicated viral particles use neuraminidase to cleave sialic on the surface of the host cell, which allows the viral particle to be released from the host cell.
NHP	Non-Human Primate	N/A
NIH	National Institutes of Health	N/A
NIOSH	National Institute for Occupational Safety and Health	N/A
OSHA	Occupational Safety and Health Administration	N/A
PFU	Plaque Forming Unit	A measure of virus infectivity per unit volume. Infectious virus particles form a plaque in cultured cells.
PPE	Personal Protective Equipment	N/A
R_0	Calculated value for communicable diseases that represents the number of additional animals that one infected animal can further infect	N/A
Reassortant	Strain having genetic material from two or more related strains	Reassortment occurs when individual hosts are infected with multiple related virus strains simultaneously and those strains exchange genetic material; this genetic mixing leads to reassortants, which are the strains that result from such exchange.
RT-PCR	Real-Time Polymerase Chain Reaction	N/A
USDA	U.S. Department of Agriculture	N/A
UV	Ultraviolet	N/A
VSD	Ventilation Shut Down	N/A
WHO	World Health Organization	N/A
WOAH	World Organisation for Animal Health	N/A

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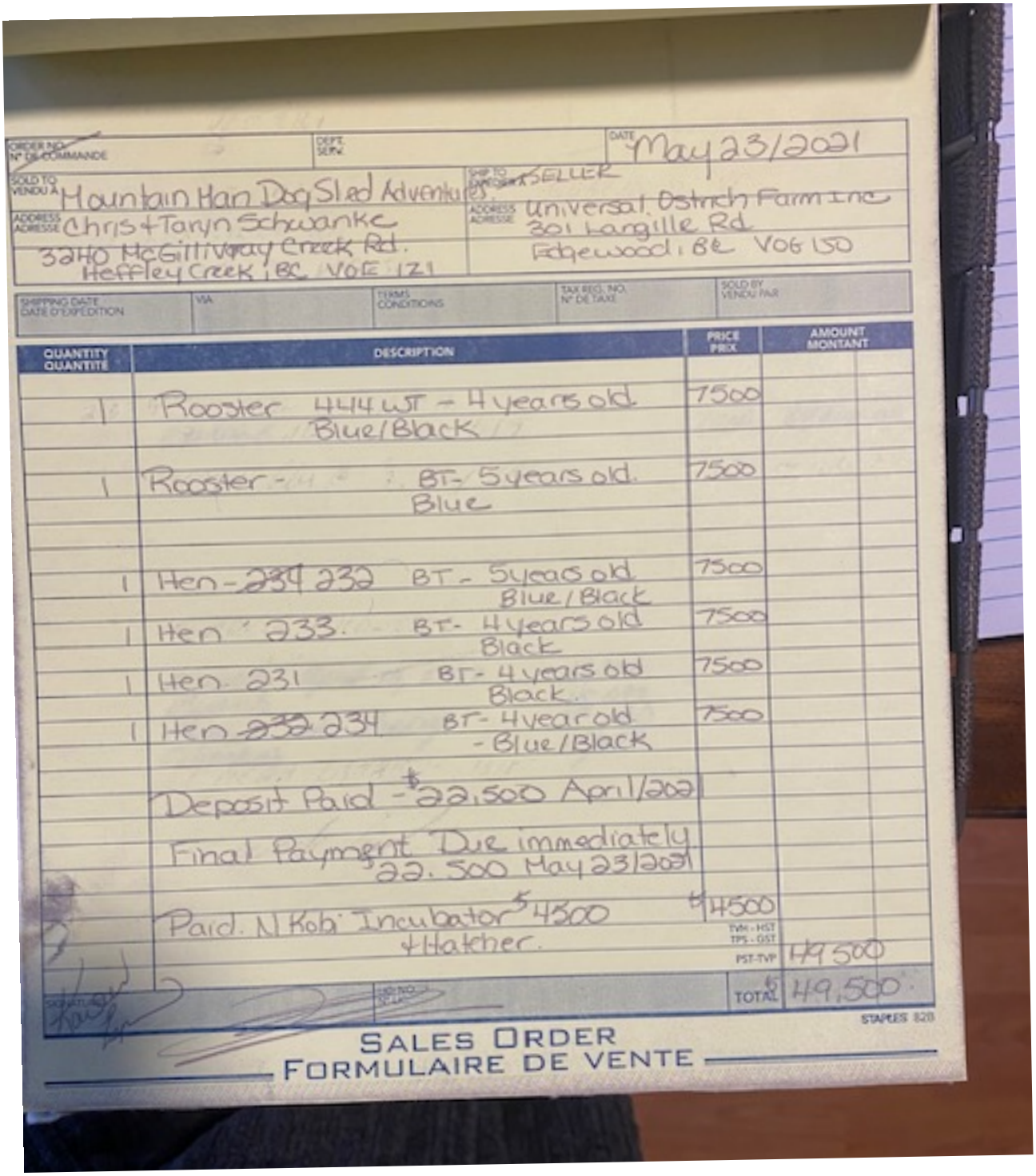

ORDER NO. / N° DE COMMANDE | DEPT. / SERV. | DATE: May 23/2021

SOLD TO / VENDU À: Mountain Man Dog Sled Adventures
ADDRESS / ADRESSE: Chris & Taryn Schwanke
3240 McGillivray Creek Rd.
Heffley Creek, BC V0E 1Z1

SHIP TO / EXPÉDIER À: ~~SELLER~~
ADDRESS / ADRESSE: Universal ~~Ostrich~~ Farming Inc
301 Langille Rd
Edgewood, BC V0G 1S0

SHIPPING DATE / DATE D'EXPÉDITION	VIA	TERMS / CONDITIONS	TAX REG. NO. / N° DE TAXE	SOLD BY / VENDU PAR

QUANTITY / QUANTITÉ	DESCRIPTION	PRICE / PRIX	AMOUNT / MONTANT
1	Rooster 444 WT - 4 years old Blue/Black	7500	
1	Rooster - BT- 5 years old. Blue	7500	
1	Hen - ~~234~~ 232 BT - 5 years old Blue/Black	7500	
1	Hen 233. BT- 4 years old Black	7500	
1	Hen 231 BT- 4 years old Black.	7500	
1	Hen ~~233~~ 234 BT- 4 year old - Blue/Black	7500	
	Deposit Paid - $22,500 April/2021		
	Final Payment Due immediately 22.500 May 23/2021		
	Paid. N Kobi Incubator $4500 + Hatcher.	$4500	
		TVH - HST TPS - GST	
		PST-TVP	49500
		TOTAL $	49,500.

SIGNATURE: Kobi | APPROVED BY / APPROUVÉ PAR

STAPLES 820

SALES ORDER
FORMULAIRE DE VENTE

Mavis Baker *Appellant*

v.

Minister of Citizenship and Immigration *Respondent*

and

The Canadian Council of Churches, the Canadian Foundation for Children, Youth and the Law, the Defence for Children International-Canada, the Canadian Council for Refugees, and the Charter Committee on Poverty Issues *Interveners*

INDEXED AS: BAKER *v.* CANADA (MINISTER OF CITIZENSHIP AND IMMIGRATION)

File No.: 25823.

1998: November 4; 1999: July 9.

Present: L'Heureux-Dubé, Gonthier, Cory, McLachlin, Iacobucci, Bastarache and Binnie JJ.

ON APPEAL FROM THE FEDERAL COURT OF APPEAL

Immigration — Humanitarian and compassionate considerations — Children's interests — Woman with Canadian-born dependent children ordered deported — Written application made on humanitarian and compassionate grounds for exemption to requirement that application for immigration be made abroad — Application denied without hearing or formal reasons — Whether procedural fairness violated — Immigration Act, R.S.C., 1985, c. I-2, ss. 82.1(1), 114(2) — Immigration Regulations, 1978, SOR/93-44, s. 2.1 — Convention on the Rights of the Child, Can. T.S. 1992 No. 3, Arts. 3, 9, 12.

Administrative law — Procedural fairness — Woman with Canadian-born dependent children ordered deported — Written application made on humanitarian and compassionate grounds for exemption to requirement that application for immigration be made abroad — Whether participatory rights accorded consistent with duty of procedural fairness — Whether failure to provide reasons violated principles of procedural fairness — Whether reasonable apprehension of bias.

Mavis Baker *Appelante*

c.

Le ministre de la Citoyenneté et de l'Immigration *Intimé*

et

Le Conseil canadien des églises, la Canadian Foundation for Children, Youth and the Law, la Défense des enfants-International-Canada, le Conseil canadien pour les réfugiés et le Comité de la Charte et des questions de pauvreté *Intervenants*

RÉPERTORIÉ: BAKER *c.* CANADA (MINISTRE DE LA CITOYENNETÉ ET DE L'IMMIGRATION)

N° du greffe: 25823.

1998: 4 novembre; 1999: 9 juillet.

Présents: Les juges L'Heureux-Dubé, Gonthier, Cory, McLachlin, Iacobucci, Bastarache et Binnie.

EN APPEL DE LA COUR D'APPEL FÉDÉRALE

Immigration — Raisons d'ordre humanitaire — Intérêts des enfants — Mesure d'expulsion contre une mère d'enfants nés au Canada — Demande écrite fondée sur des raisons d'ordre humanitaire sollicitant une dispense de l'exigence de présenter à l'extérieur du Canada une demande d'immigration — Demande rejetée sans audience ni motifs écrits — Y a-t-il eu violation de l'équité procédurale? — Loi sur l'immigration, L.R.C. (1985), ch. I-2, art. 82.1(1), 114(2) — Règlement sur l'immigration de 1978, DORS/93-44, art. 2.1 — Convention relative aux droits de l'enfant, R.T. Can. 1992 n° 3, art. 3, 9, 12.

Droit administratif – Équité procédurale — Mesure d'expulsion contre une mère d'enfants nés au Canada — Demande écrite fondée sur des raisons d'ordre humanitaire sollicitant une dispense de l'exigence de présenter à l'extérieur du Canada une demande d'immigration — Les droits de participation accordés étaient-ils compatibles avec l'obligation d'équité procédurale? — Le défaut d'exposer les motifs de décision a-t-il enfreint les principes d'équité procédurale? — Y a-t-il une crainte raisonnable de partialité?

1999 CanLII 699 (SCC)

Courts — Appellate review — Judge on judicial review certifying question for consideration of Court of Appeal — Legal effect of certified question — Immigration Act, R.S.C., 1985, c. I-2, s. 83(1).

Immigration — Humanitarian and compassionate considerations — Standard of review of humanitarian and compassionate decision — Best interests of claimant's children — Approach to be taken in reviewing humanitarian and compassionate decision where children affected.

Administrative law — Review of discretion — Approach to review of discretionary decision making.

The appellant, a woman with Canadian-born dependent children, was ordered deported. She then applied for an exemption, based on humanitarian and compassionate considerations under s. 114(2) of the *Immigration Act*, from the requirement that an application for permanent residence be made from outside Canada. This application was supported by letters indicating concern about the availability of medical treatment in her country of origin and the effect of her possible departure on her Canadian-born children. A senior immigration officer replied by letter stating that there were insufficient humanitarian and compassionate reasons to warrant processing the application in Canada. This letter contained no reasons for the decision. Counsel for the appellant, however, requested and was provided with the notes made by the investigating immigration officer and used by the senior officer in making his decision. The Federal Court — Trial Division, dismissed an application for judicial review but certified the following question pursuant to s. 83(1) of the Act: "Given that the Immigration Act does not expressly incorporate the language of Canada's international obligations with respect to the International Convention on the Rights of the Child, must federal immigration authorities treat the best interests of the Canadian child as a primary consideration in assessing an applicant under s. 114(2) of the *Immigration Act*?" The Court of Appeal limited its consideration to the question and found that the best interests of the children did not need to be given primacy in assessing such an application. The order that the appellant be removed from Canada, which was made after the immigration officer's decision, was stayed pending the result of this appeal.

Tribunaux — Contrôle en appel — Certification, par le juge siégeant en contrôle judiciaire, d'une question à soumettre à la Cour d'appel — Effet juridique d'une question certifiée — Loi sur l'immigration, L.R.C. (1985), ch. I-2, art. 83(1).

Immigration — Raisons d'ordre humanitaire — Norme de contrôle d'une décision fondée sur des raisons d'ordre humanitaire — Intérêt supérieur des enfants de la demanderesse — Approche du contrôle d'une décision fondée sur des raisons d'ordre humanitaire touchant des enfants.

Droit administratif — Contrôle du pouvoir discrétionnaire — Approche du contrôle de décisions discrétionnaires.

Une mesure d'expulsion a été prise contre l'appelante, mère d'enfants à charge nés au Canada. Elle a alors demandé d'être dispensée de faire sa demande de résidence permanente de l'extérieur du Canada, pour des raisons d'ordre humanitaire, conformément au par. 114(2) de la *Loi sur l'immigration*. Sa demande était appuyée de lettres exprimant des inquiétudes quant à la possibilité d'obtenir un traitement médical dans son pays d'origine et quant à l'effet de son départ éventuel sur ses enfants nés au Canada. Un agent d'immigration supérieur a répondu par lettre qu'il n'y avait pas suffisamment de raisons humanitaires pour justifier de traiter sa demande au Canada. Cette lettre ne donnait pas les motifs de la décision. L'avocat de l'appelante a cependant demandé et reçu les notes de l'agent investigateur, que l'agent supérieur d'immigration avait utilisées pour rendre sa décision. La Section de première instance de la Cour fédérale a rejeté une demande de contrôle judiciaire mais a certifié la question suivante en application du par. 83(1) de la Loi: «Vu que la Loi sur l'immigration n'incorpore pas expressément le langage des obligations internationales du Canada en ce qui concerne la Convention internationale relative aux droits de l'enfant, les autorités d'immigration fédérales doivent-elles considérer l'intérêt supérieur de l'enfant né au Canada comme une considération primordiale dans l'examen du cas d'un requérant sous le régime du par. 114(2) de la *Loi sur l'immigration*?» La Cour d'appel a limité son examen à cette question et a conclu qu'il n'était pas nécessaire d'accorder la primauté à l'intérêt supérieur des enfants dans l'appréciation d'une telle demande. Un sursis à la mesure d'expulsion de l'appelante prononcée après la décision de l'agent d'immigration, a été ordonné jusqu'à l'issue du présent pourvoi.

1999 CanLII 699 (SCC)

Held: The appeal should be allowed.

Per L'Heureux-Dubé, Gonthier, McLachlin, Bastarache and Binnie JJ.: Section 83(1) of the *Immigration Act* does not require the Court of Appeal to address only the certified question. Once a question has been certified, the Court of Appeal may consider all aspects of the appeal lying within its jurisdiction.

The duty of procedural fairness is flexible and variable and depends on an appreciation of the context of the particular statute and the rights affected. The purpose of the participatory rights contained within it is to ensure that administrative decisions are made using a fair and open procedure, appropriate to the decision being made and its statutory, institutional and social context, with an opportunity for those affected to put forward their views and evidence fully and have them considered by the decision-maker. Several factors are relevant to determining the content of the duty of fairness: (1) the nature of the decision being made and process followed in making it; (2) the nature of the statutory scheme and the terms of the statute pursuant to which the body operates; (3) the importance of the decision to the individual or individuals affected; (4) the legitimate expectations of the person challenging the decision; (5) the choices of procedure made by the agency itself. This list is not exhaustive.

A duty of procedural fairness applies to humanitarian and compassionate decisions. In this case, there was no legitimate expectation affecting the content of the duty of procedural fairness. Taking into account the other factors, although some suggest stricter requirements under the duty of fairness, others suggest more relaxed requirements further from the judicial model. The duty of fairness owed in these circumstances is more than minimal, and the claimant and others whose important interests are affected by the decision in a fundamental way must have a meaningful opportunity to present the various types of evidence relevant to their case and have it fully and fairly considered. Nevertheless, taking all the factors into account, the lack of an oral hearing or notice of such a hearing did not constitute a violation of the requirement of procedural fairness. The opportunity to produce full and complete written documentation was sufficient.

It is now appropriate to recognize that, in certain circumstances, including when the decision has important significance for the individual, or when there is a statutory right of appeal, the duty of procedural fairness will require a written explanation for a decision. Reasons are

Arrêt: Le pourvoi est accueilli.

Les juges L'Heureux-Dubé, Gonthier, McLachlin, Bastarache et Binnie: Le paragraphe 83(1) de la *Loi sur l'immigration* n'exige pas que la Cour d'appel traite seulement la question certifiée. Lorsqu'une question a été certifiée, la Cour d'appel peut examiner tous les aspects de l'appel qui relèvent de sa compétence.

L'obligation d'équité procédurale est souple et variable et repose sur une appréciation du contexte de la loi et des droits visés. Les droits de participation qui en font partie visent à garantir que les décisions administratives sont prises au moyen d'une procédure équitable et ouverte, adaptée au type de décision et à son contexte légal, institutionnel et social, comprenant la possibilité donnée aux personnes visées de présenter leur point de vue et des éléments de preuve qui seront dûment pris en considération par le décideur. Plusieurs facteurs sont pertinents pour déterminer le contenu de l'obligation d'équité procédurale: (1) la nature de la décision recherchée et le processus suivi pour y parvenir; (2) la nature du régime législatif et les termes de la loi régissant l'organisme; (3) l'importance de la décision pour les personnes visées; (4) les attentes légitimes de la personne qui conteste la décision; (5) les choix de procédure que l'organisme fait lui-même. Cette liste de facteurs n'est pas exhaustive.

L'obligation d'équité procédurale s'applique aux décisions d'ordre humanitaire. En l'espèce, il n'y avait pas d'attente légitime ayant une incidence sur la nature de l'obligation d'équité procédurale. Compte tenu des autres facteurs, bien que certains indiquent des exigences plus strictes en vertu de l'obligation d'équité, d'autres indiquent des exigences moins strictes et plus éloignées du modèle judiciaire. L'obligation d'équité dans ces circonstances est plus que minimale, et le demandeur et les personnes dont les intérêts sont profondément touchés par la décision doivent avoir une possibilité valable de présenter les divers types de preuves qui se rapportent à leur affaire et de les voir évalués de façon complète et équitable. Néanmoins, compte tenu de tous ces facteurs, le fait qu'il n'y ait pas eu d'audience ni d'avis d'audience ne constituait pas un manquement à l'obligation d'équité procédurale. La possibilité de produire une documentation écrite complète était suffisante.

Il est maintenant approprié de reconnaître que, dans certaines circonstances, notamment lorsque la décision revêt une grande importance pour l'individu, ou lorsqu'il existe un droit d'appel prévu par la loi, l'obligation d'équité procédurale requerra une explication écrite de

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required here given the profound importance of this decision to those affected. This requirement was fulfilled by the provision of the junior immigration officer's notes, which are to be taken to be the reasons for decision. Accepting such documentation as sufficient reasons upholds the principle that individuals are entitled to fair procedures and open decision-making, but recognizes that, in the administrative context, this transparency may take place in various ways.

Procedural fairness also requires that decisions be made free from a reasonable apprehension of bias, by an impartial decision-maker. This duty applies to all immigration officers who play a role in the making of decisions. Because they necessarily relate to people of diverse backgrounds, from different cultures, races, and continents, immigration decisions demand sensitivity and understanding by those making them. They require a recognition of diversity, an understanding of others, and an openness to difference. Statements in the immigration officer's notes gave the impression that he may have been drawing conclusions based not on the evidence before him, but on the fact that the appellant was a single mother with several children and had been diagnosed with a psychiatric illness. Here, a reasonable and well-informed member of the community would conclude that the reviewing officer had not approached this case with the impartiality appropriate to a decision made by an immigration officer. The notes therefore give rise to a reasonable apprehension of bias.

The concept of discretion refers to decisions where the law does not dictate a specific outcome, or where the decision-maker is given a choice of options within a statutorily imposed set of boundaries. Administrative law has traditionally approached the review of decisions classified as discretionary separately from those seen as involving the interpretation of rules of law. Review of the substantive aspects of discretionary decisions is best approached within the pragmatic and functional framework defined by this Court's decisions, especially given the difficulty in making rigid classifications between discretionary and non-discretionary decisions. Though discretionary decisions will generally be given considerable respect, that discretion must be exercised in accordance with the boundaries imposed in the statute, the principles of the rule of law, the principles of administrative law, the fundamental values of Canadian society, and the principles of the *Charter*.

la décision. Des motifs écrits sont nécessaires en l'espèce, étant donné l'importance cruciale de la décision pour les personnes visées. Cette obligation a été remplie par la production des notes de l'agent subalterne, qui doivent être considérées comme les motifs de la décision. L'admission de ces documents comme motifs de la décision confirme le principe selon lequel les individus ont droit à une procédure équitable et à la transparence de la prise de décision, mais reconnaît aussi qu'en matière administrative, cette transparence peut être atteinte de différentes façons.

L'équité procédurale exige également que les décisions soient rendues par un décideur impartial, sans crainte raisonnable de partialité. Cette obligation s'applique à tous les agents d'immigration qui jouent un rôle significatif dans la prise de décision. Parce qu'elles visent nécessairement des personnes de provenances diverses, issues de cultures, de races et de continents différents, les décisions en matière d'immigration exigent de ceux qui les rendent sensibilité et compréhension. Elles exigent la reconnaissance de la diversité, la compréhension des autres et l'ouverture d'esprit à la différence. Les déclarations contenues dans les notes de l'agent d'immigration donnent l'impression qu'il peut avoir tiré des conclusions en se fondant non pas sur la preuve dont il disposait, mais sur le fait que l'appelante était une mère célibataire ayant plusieurs enfants, et était atteinte de troubles psychiatriques. En l'espèce, un membre raisonnable et bien informé de la communauté conclurait que l'agent n'a pas traité cette affaire avec l'impartialité requise dans une décision rendue par un agent d'immigration. Les notes donnent donc lieu à une crainte raisonnable de partialité.

La notion de pouvoir discrétionnaire s'applique dans les cas où le droit ne dicte pas une décision précise, ou quand le décideur se trouve devant un choix d'options à l'intérieur de limites imposées par la loi. Le droit administratif a traditionnellement abordé le contrôle judiciaire des décisions discrétionnaires séparément de décisions sur l'interprétation de règles de droit. Le contrôle des éléments de fond d'une décision discrétionnaire est mieux envisagé selon la démarche pragmatique et fonctionnelle définie par la jurisprudence de notre Cour, compte tenu particulièrement de la difficulté de faire des classifications rigides entre les décisions discrétionnaires et les décisions non discrétionnaires. Même si en général il sera accordé un grand respect aux décisions discrétionnaires, il faut que le pouvoir discrétionnaire soit exercé conformément aux limites imposées dans la loi, aux principes de la primauté du droit, aux principes du droit administratif, aux valeurs fondamentales de la société canadienne, et aux principes de la *Charte*.

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In applying the applicable factors to determining the standard of review, considerable deference should be accorded to immigration officers exercising the powers conferred by the legislation, given the fact-specific nature of the inquiry, its role within the statutory scheme as an exception, and the considerable discretion evidenced by the statutory language. Yet the absence of a privative clause, the explicit contemplation of judicial review by the Federal Court — Trial Division, and the individual rather than polycentric nature of the decision also suggest that the standard should not be as deferential as "patent unreasonableness". The appropriate standard of review is, therefore, reasonableness *simpliciter*.

Dans l'application des facteurs pertinents à la détermination de la norme de contrôle appropriée, on devrait faire preuve d'une retenue considérable envers les décisions d'agents d'immigration exerçant les pouvoirs conférés par la loi, compte tenu de la nature factuelle de l'analyse, de son rôle d'exception au sein du régime législatif et de la large discrétion accordée par le libellé de la loi. Toutefois, l'absence de clause privative, la possibilité expressément prévue d'un contrôle judiciaire par la Cour fédérale — Section de première instance, ainsi que la nature individuelle plutôt que polycentrique de la décision, tendent aussi à indiquer que la norme applicable ne devrait pas en être une d'aussi grande retenue que celle du caractère «manifestement déraisonnable». La norme de contrôle appropriée est celle de la décision raisonnable *simpliciter*.

The wording of the legislation shows Parliament's intention that the decision be made in a humanitarian and compassionate manner. A reasonable exercise of the power conferred by the section requires close attention to the interests and needs of children since children's rights, and attention to their interests, are central humanitarian and compassionate values in Canadian society. Indications of these values may be found in the purposes of the Act, in international instruments, and in the Minister's guidelines for making humanitarian and compassionate decisions. Because the reasons for this decision did not indicate that it was made in a manner which was alive, attentive, or sensitive to the interests of the appellant's children, and did not consider them as an important factor in making the decision, it was an unreasonable exercise of the power conferred by the legislation. In addition, the reasons for decision failed to give sufficient weight or consideration to the hardship that a return to the appellant's country of origin might cause her.

Le libellé de la législation révèle l'intention du Parlement de faire en sorte que la décision soit fondée sur des raisons d'ordre humanitaire. L'exercice raisonnable du pouvoir conféré par l'article exige que soit prêtée une attention minutieuse aux intérêts et aux besoins des enfants puisque les droits des enfants, et la considération de leurs intérêts, sont des valeurs humanitaires centrales dans la société canadienne. Une indication de ces valeurs se trouve dans les objectifs de la Loi, dans les instruments internationaux, et dans les lignes directrices régissant les décisions d'ordre humanitaire publiées par le ministre. Étant donné que les motifs de la décision n'indiquent pas qu'elle a été rendue d'une manière réceptive, attentive ou sensible à l'intérêt des enfants de l'appelante, ni que leur intérêt a été considéré comme un facteur décisionnel important, elle constituait un exercice déraisonnable du pouvoir conféré par la loi. En outre, les motifs de la décision n'accordent pas suffisamment d'importance ou de poids aux difficultés qu'un retour de l'appelante dans son pays d'origine pouvait lui susciter.

Per Cory and Iacobucci JJ.: The reasons and disposition of L'Heureux-Dubé J. were agreed with apart from the effect of international law on the exercise of ministerial discretion under s. 114(2) of the *Immigration Act*. The certified question must be answered in the negative. The principle that an international convention ratified by the executive is of no force or effect within the Canadian legal system until incorporated into domestic law does not survive intact the adoption of a principle of law which permits reference to an unincorporated convention during the process of statutory interpretation.

Les juges Cory et Iacobucci: Les motifs du juge L'Heureux-Dubé et le dispositif qu'elle propose sont acceptés sauf pour ce qui concerne la question de l'effet du droit international sur l'exercice du pouvoir discrétionnaire conféré au ministre par le par. 114(2) de la *Loi sur l'immigration*. La question certifiée devrait recevoir une réponse négative. Le principe qu'une convention internationale ratifiée par le pouvoir exécutif n'a aucun effet en droit canadien tant qu'elle n'est pas incorporée dans le droit interne ne peut pas survivre intact après l'adoption d'un principe de droit qui autorise le recours dans le processus d'interprétation des lois, aux dispositions d'une convention qui n'a pas été intégrée dans la législation.

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APPEAL from a judgment of the Federal Court of Appeal, [1997] 2 F.C. 127, 207 N.R. 57, 142 D.L.R. (4th) 554, [1996] F.C.J. No. 1726 (QL), dismissing an appeal from a judgment of Simpson J. (1995), 101 F.T.R. 110, 31 Imm. L.R. (2d) 150, [1995] F.C.J. No. 1441 (QL), dismissing an application for judicial review. Appeal allowed.

POURVOI contre un arrêt de la Cour d'appel fédérale, [1997] 2 C.F. 127, 207 N.R. 57, 142 D.L.R. (4th) 554, [1996] A.C.F. nº 1726 (QL), qui a rejeté un appel d'un jugement du juge Simpson (1995), 101 F.T.R. 110, 31 Imm. L.R. (2d) 150, [1995] A.C.F. nº 1441 (QL), qui avait rejeté une demande de contrôle judiciaire. Pourvoi accueilli.

Roger Rowe and *Rocco Galati*, for the appellant.

Roger Rowe et *Rocco Galati*, pour l'appelante.

Urszula Kaczmarczyk and *Cheryl D. Mitchell*, for the respondent.

Urszula Kaczmarczyk et *Cheryl D. Mitchell*, pour l'intimé.

Sheena Scott and *Sharryn Aiken*, for the interveners the Canadian Foundation for Children,

Sheena Scott et *Sharryn Aiken*, pour les intervenants la Canadian Foundation for Children, Youth

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Youth and the Law, the Defence for Children International-Canada, and the Canadian Council for Refugees.

John Terry and *Craig Scott*, for the intervener the Charter Committee on Poverty Issues.

Barbara Jackman and *Marie Chen*, for the intervener the Canadian Council of Churches.

The judgment of L'Heureux-Dubé, Gonthier, McLachlin, Bastarache and Binnie JJ. was delivered by

L'HEUREUX-DUBÉ J. — Regulations made pursuant to s. 114(2) of the *Immigration Act*, R.S.C., 1985, c. I-2, empower the respondent Minister to facilitate the admission to Canada of a person where the Minister is satisfied, owing to humanitarian and compassionate considerations, that admission should be facilitated or an exemption from the regulations made under the Act should be granted. At the centre of this appeal is the approach to be taken by a court to judicial review of such decisions, both on procedural and substantive grounds. It also raises issues of reasonable apprehension of bias, the provision of written reasons as part of the duty of fairness, and the role of children's interests in reviewing decisions made pursuant to s. 114(2).

I. Factual Background

Mavis Baker is a citizen of Jamaica who entered Canada as a visitor in August of 1981 and has remained in Canada since then. She never received permanent resident status, but supported herself illegally as a live -in domestic worker for 11 years. She has had four children (who are all Canadian citizens) while living in Canada: Paul Brown, born in 1985, twins Patricia and Peter Robinson, born in 1989, and Desmond Robinson, born in 1992. After Desmond was born, Ms. Baker suffered from post-partum psychosis and was diagnosed with paranoid schizophrenia. She applied for welfare at that time. When she was first diagnosed with mental illness, two of her children were placed in the care of their

and the Law, la Défense des enfants-International-Canada et le Conseil canadien pour les réfugiés.

John Terry et *Craig Scott*, pour l'intervenant le Comité de la Charte et des questions de pauvreté.

Barbara Jackman et *Marie Chen*, pour l'intervenant le Conseil canadien des églises.

Version française du jugement des juges L'Heureux-Dubé, Gonthier, McLachlin, Bastarache et Binnie rendu par

LE JUGE L'HEUREUX-DUBÉ — Le règlement passé en vertu du par. 114(2) de la *Loi sur l'immigration*, L.R.C. (1985), ch. I-2, autorise le ministre intimé à faciliter l'admission au Canada d'une personne quand il est convaincu, pour des raisons d'ordre humanitaire, que l'admission devrait être facilitée ou qu'une dispense d'application des règlements passés aux termes de la Loi devrait être accordée. Le présent pourvoi porte essentiellement sur la démarche à suivre lorsqu'un tribunal procède au contrôle judiciaire de ces décisions, à la fois sur le fond et sur le plan de la procédure. Ce pourvoi soulève également des questions relatives à la crainte raisonnable de partialité, à la rédaction de motifs écrits dans le cadre de l'obligation d'agir équitablement et au rôle de l'intérêt des enfants dans le contrôle judiciaire de décisions rendues conformément au par. 114(2). 1

I. Les faits

Mavis Baker, citoyenne de la Jamaïque, est entrée au Canada à titre de visiteur en août 1981 et y vit depuis. Elle n'a jamais obtenu le statut de résidente permanente, mais a subvenu illégalement à ses besoins en travaillant pendant 11 ans comme travailleur domestique. Elle a eu quatre enfants (qui sont tous citoyens canadiens) au Canada: Paul Brown, né en 1985, les jumeaux Patricia et Peter Robinson, nés en 1989, et Desmond Robinson, né en 1992. Après la naissance de Desmond, M^me^ Baker a souffert d'une psychose post-partum et on a diagnostiqué qu'elle était atteinte d'une schizophrénie paranoïde. À cette époque, elle a présenté une demande d'assistance sociale. Quand 2

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natural father, and the other two were placed in foster care. The two who were in foster care are now again under her care, since her condition has improved.

3 The appellant was ordered deported in December 1992, after it was determined that she had worked illegally in Canada and had overstayed her visitor's visa. In 1993, Ms. Baker applied for an exemption from the requirement to apply for permanent residence outside Canada, based upon humanitarian and compassionate considerations, pursuant to s. 114(2) of the *Immigration Act*. She had the assistance of counsel in filing this application, and included, among other documentation, submissions from her lawyer, a letter from her doctor, and a letter from a social worker with the Children's Aid Society. The documentation provided indicated that, although she was still experiencing psychiatric problems, she was making progress. It also stated that she might become ill again if she were forced to return to Jamaica, since treatment might not be available for her there. Ms. Baker's submissions also clearly indicated that she was the sole caregiver for two of her Canadian-born children, and that the other two depended on her for emotional support and were in regular contact with her. The documentation suggested that she too would suffer emotional hardship if she were separated from them.

4 The response to this request was contained in a letter dated April 18, 1994 and signed by Immigration Officer M. Caden, stating that a decision had been made that there were insufficient humanitarian and compassionate grounds to warrant processing Ms. Baker's application for permanent residence within Canada. This letter contained no reasons for the decision.

5 Upon request of the appellant's counsel, she was provided with the notes made by Immigration Officer G. Lorenz, which were used by Officer Caden when making his decision. After a summary

on a découvert qu'elle était atteinte de troubles mentaux, deux de ses enfants ont été confiés aux soins de leur père naturel et les deux autres ont été placés en foyer d'accueil. Son état s'étant amélioré, elle a de nouveau la garde des deux enfants placés en foyer d'accueil.

En décembre 1992, une ordonnance d'expulsion a été prise contre l'appelante, lorsqu'on a découvert qu'elle avait travaillé illégalement au Canada et avait séjourné au-delà de son visa de visiteur. En 1993, M^me^ Baker a demandé d'être dispensée de faire sa demande de résidence permanente de l'extérieur du Canada, pour des raisons d'ordre humanitaire, conformément au par. 114(2) de la *Loi sur l'immigration*. Elle a obtenu l'aide d'un avocat pour remplir cette demande, et a notamment ajouté, comme documents additionnels, des observations de son avocat, une lettre de son médecin et une lettre d'un travailleur social de la Société d'aide à l'enfance. Les documents présentés indiquaient que, même si elle éprouvait toujours des problèmes psychiatriques, elle faisait des progrès, mais qu'elle pourrait retomber malade si elle était forcée de retourner en Jamaïque, parce qu'elle ne pourrait peut-être pas y bénéficier d'un traitement. Madame Baker a aussi clairement indiqué qu'elle était la seule à pouvoir prendre soin de deux de ses enfants nés au Canada et que ses deux autres enfants avaient besoin de son soutien affectif et étaient régulièrement en contact avec elle. Les documents mentionnaient également qu'elle subirait aussi des difficultés d'ordre émotionnel si elle était séparée d'eux.

En réponse à cette demande, une lettre datée du 18 avril 1994 et signée par l'agent d'immigration M. Caden a informé M^me^ Baker de la décision qu'il n'y avait pas suffisamment de raisons humanitaires pour justifier de traiter au Canada sa demande de résidence permanente, sans toutefois donner les motifs de la décision.

À la demande de l'avocat de l'appelante, les notes de l'agent d'immigration G. Lorenz, que l'agent Caden a utilisées pour rendre sa décision, ont été remises à l'appelante. Après un résumé de

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of the history of the case, Lorenz's notes read as follows:

PC is unemployed — on Welfare. No income shown — no assets. Has four Cdn.-born children — four other children in Jamaica — HAS A TOTAL OF EIGHT CHILDREN

Says only two children are in her "direct custody". (No info on who has ghe [*sic*] other two). There is nothing for her in Jamaica — hasn't been there in a long time — no longer close to her children there — no jobs there — she has no skills other than as a domestic — children would suffer — can't take them with her and can't leave them with anyone here. Says has suffered from a mental disorder since '81 — is now an outpatient and is improving. If sent back will have a relapse.

Letter from Children's Aid — they say PC has been diagnosed as a paranoid schizophrenic. — children would suffer if returned — Letter of Aug. '93 from psychiatrist from Ont. Govm't. Says PC had post-partum psychosis and had a brief episode of psychosis in Jam. when was 25 yrs. old. Is now an out-patient and is doing relatively well — deportation would be an extremely stressful experience.

Lawyer says PS [*sic*] is sole caregiver and single parent of two Cdn born children. Pc's mental condition would suffer a setback if she is deported etc.

This case is a catastrophy [*sic*]. It is also an indictment of our "system" that the client came as a visitor in Aug. '81, was not ordered deported until Dec. '92 and in APRIL '94 IS STILL HERE!

The PC is a paranoid schizophrenic and on welfare. She has no qualifications other than as a domestic. She has FOUR CHILDREN IN JAMAICA AND ANOTHER FOUR BORN HERE. She will, of course, be a tremendous strain on our social welfare systems for (probably) the rest of her life. There are no H&C factors other than her FOUR CANADIAN-BORN CHILDREN. Do we let her stay because of that? I am of the opinion that Canada can no longer afford this type of generosity. However, because of the circumstances involved, there

l'historique de l'affaire, les notes de M. Lorenz se lisent:

[TRADUCTION] PC est sans emploi — reçoit l'assistance sociale. Aucun revenu connu — pas de biens. A quatre enfants nés au Canada, quatre autres en Jamaïque — HUIT ENFANTS AU TOTAL

Dit que seulement deux enfants sont sous sa garde directe. (Aucun renseignement sur la garde des deux autres). Il n'y a rien qui l'attend en Jamaïque — n'y est pas allée depuis longtemps — n'est plus proche de ses enfants qui s'y trouvent — pas d'emplois — n'a pas d'autre métier que celui de domestique — les enfants souffriraient — elle ne peut pas les emmener avec elle et elle n'a personne ici à qui les confier. Dit qu'elle souffre de troubles mentaux depuis 1981 — elle est actuellement une patiente en consultation externe et son état s'améliore. Si elle est renvoyée là-bas, elle fera une rechute.

Lettre de la Société d'aide à l'enfance — dit que PC souffre d'une schizophrénie paranoïde — les enfants souffriraient, si elle était renvoyée. Lettre d'août 1993 d'un psychiatre du gouvernement de l'Ontario — dit que PC a une psychose post-partum et a eu une brève période de psychose en Jamaïque quand elle avait 25 ans. Elle est maintenant patiente en consultation externe et se porte relativement bien — l'expulsion serait une expérience extrêmement stressante.

L'avocat dit que PC est une mère célibataire et qu'elle est la seule à pouvoir prendre soin de deux de ses enfants nés au Canada. L'état mental de PC se détériorerait si elle devait être déportée etc.

Cette affaire est une catastrophe. C'est aussi une condamnation de notre système: la cliente est arrivée comme visiteur en août 1981, une ordonnance d'expulsion n'a été prise qu'en décembre 1992 et en AVRIL 1994 ELLE EST TOUJOURS ICI!

PC est atteinte de schizophrénie paranoïde et reçoit l'assistance sociale. Elle n'a pas d'autres qualifications que de domestique. Elle a QUATRE ENFANTS EN JAMAÏQUE ET QUATRE AUTRES NÉS ICI. Elle sera, bien entendu, un fardeau excessif pour nos systèmes d'aide sociale (probablement) pour le reste de sa vie. Il n'existe pas d'autres facteurs d'ordre humanitaire que ses QUATRE ENFANTS NÉS AU CANADA. Devons-nous lui permettre de rester pour ça? Je suis d'avis que le Canada ne peut plus se permettre cette sorte de générosité. Toutefois, compte tenu des circonstances, il est possible qu'il y ait une mauvaise presse.

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is a potential for adverse publicity. I recommend refusal but you may wish to clear this with someone at Region.

There is also a potential for violence — see charge of "assault with a weapon" [Capitalization in original.]

6 Following the refusal of her application, Ms. Baker was served, on May 27, 1994, with a direction to report to Pearson Airport on June 17 for removal from Canada. Her deportation has been stayed pending the result of this appeal.

II. Relevant Statutory Provisions and Provisions of International Treaties

7 *Immigration Act*, R.S.C., 1985, c. I-2

82.1 (1) An application for judicial review under the *Federal Court Act* with respect to any decision or order made, or any matter arising, under this Act or the rules or regulations thereunder may be commenced only with leave of a judge of the Federal Court — Trial Division.

83. (1) A judgment of the Federal Court — Trial Division on an application for judicial review with respect to any decision or order made, or any matter arising, under this Act or the rules or regulations thereunder may be appealed to the Federal Court of Appeal only if the Federal Court — Trial Division has at the time of rendering judgment certified that a serious question of general importance is involved and has stated that question.

114. . . .

(2) The Governor in Council may, by regulation, authorize the Minister to exempt any person from any regulation made under subsection (1) or otherwise facilitate the admission of any person where the Minister is satisfied that the person should be exempted from that regulation or that the person's admission should be facilitated owing to the existence of compassionate or humanitarian considerations.

Immigration Regulations, 1978, SOR/78-172, as amended by SOR/93-44

2.1 The Minister is hereby authorized to exempt any person from any regulation made under subsection 114(1) of the Act or otherwise facilitate the admission to

Je recommande le rejet, mais vous désirerez peut-être obtenir l'approbation de quelqu'un au centre régional.

Violence possible — voir l'accusation d'agression armée. [Majuscules dans l'original.]

À la suite du rejet de sa demande, M^me^ Baker a reçu signification, le 27 mai 1994, de l'ordre de se présenter à l'aéroport Pearson le 17 juin pour son renvoi du Canada. Un sursis d'expulsion a été ordonné jusqu'à l'issue du présent pourvoi.

II. Les dispositions législatives et des traités internationaux

Loi sur l'immigration, L.R.C. (1985), ch. I-2

82.1 (1) La présentation d'une demande de contrôle judiciaire aux termes de la *Loi sur la Cour fédérale* ne peut, pour ce qui est des décisions ou ordonnances rendues, des mesures prises ou de toute question soulevée dans le cadre de la présente loi ou de ses textes d'application — règlements ou règles — se faire qu'avec l'autorisation d'un juge de la Section de première instance de la Cour fédérale.

83. (1) Le jugement de la Section de première instance de la Cour fédérale rendu sur une demande de contrôle judiciaire relative à une décision ou ordonnance rendue, une mesure prise ou toute question soulevée dans le cadre de la présente loi ou de ses textes d'application — règlements ou règles — ne peut être porté en appel devant la Cour d'appel fédérale que si la Section de première instance certifie dans son jugement que l'affaire soulève une question grave de portée générale et énonce celle-ci.

114. . . .

(2) Le gouverneur en conseil peut, par règlement, autoriser le ministre à accorder, pour des raisons d'ordre humanitaire, une dispense d'application d'un règlement pris aux termes du paragraphe (1) ou à faciliter l'admission de toute autre manière.

Règlement sur l'immigration de 1978, DORS/78-172, modifié par DORS/93-44

2.1 Le ministre est autorisé à accorder, pour des raisons d'ordre humanitaire, une dispense d'application d'un règlement pris aux termes du paragraphe 114(1) de

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Canada of any person where the Minister is satisfied that the person should be exempted from that regulation or that the person's admission should be facilitated owing to the existence of compassionate or humanitarian considerations.

Convention on the Rights of the Child, Can. T.S. 1992 No. 3

Article 3

1. In all actions concerning children, whether undertaken by public or private social welfare institutions, courts of law, administrative authorities or legislative bodies, the best interests of the child shall be a primary consideration.

2. States Parties undertake to ensure the child such protection and care as is necessary for his or her well-being, taking into account the rights and duties of his or her parents, legal guardians, or other individuals legally responsible for him or her, and, to this end, shall take all appropriate legislative and administrative measures.

Article 9

1. States Parties shall ensure that a child shall not be separated from his or her parents against their will, except when competent authorities subject to judicial review determine, in accordance with applicable law and procedures, that such separation is necessary for the best interests of the child. Such determination may be necessary in a particular case such as one involving abuse or neglect of the child by the parents, or one where the parents are living separately and a decision must be made as to the child's place of residence.

2. In any proceedings pursuant to paragraph 1 of the present article, all interested parties shall be given an opportunity to participate in the proceedings and make their views known.

3. States Parties shall respect the right of the child who is separated from one or both parents to maintain personal relations and direct contact with both parents on a regular basis, except if it is contrary to the child's best interests.

4. Where such separation results from any action initiated by a State Party, such as the detention, imprisonment, exile, deportation or death (including death arising from any cause while the person is in the custody of the State) of one or both parents or of the child, that State Party shall, upon request, provide the parents, the child or, if appropriate, another member of the family

la Loi ou à faciliter l'admission au Canada de toute autre manière.

Convention relative aux droits de l'enfant, R.T. Can. 1992 nº 3

Article 3

1. Dans toutes les décisions qui concernent les enfants, qu'elles soient le fait des institutions publiques ou privées de protection sociale, des tribunaux, des autorités administratives ou des organes législatifs, l'intérêt supérieur de l'enfant doit être une considération primordiale.

2. Les États parties s'engagent à assurer à l'enfant la protection et les soins nécessaires à son bien-être, compte tenu des droits et des devoirs de ses parents, de ses tuteurs ou des autres personnes légalement responsables de lui, et ils prennent à cette fin toutes les mesures législatives et administratives appropriées.

Article 9

1. Les États parties veillent à ce que l'enfant ne soit pas séparé de ses parents contre leur gré, à moins que les autorités compétentes ne décident, sous réserve de révision judiciaire et conformément aux lois et procédures applicables, que cette séparation est nécessaire dans l'intérêt supérieur de l'enfant. Une décision en ce sens peut être nécessaire dans certains cas particuliers, par exemple lorsque les parents maltraitent ou négligent l'enfant, ou lorsqu'ils vivent séparément et qu'une décision doit être prise au sujet du lieu de résidence de l'enfant.

2. Dans tous les cas prévus au paragraphe 1 du présent article, toutes les parties intéressées doivent avoir la possibilité de participer aux délibérations et de faire connaître leurs vues.

3. Les États parties respectent le droit de l'enfant séparé de ses deux parents ou de l'un d'eux d'entretenir régulièrement des relations personnelles et des contacts directs avec ses deux parents, sauf si cela est contraire à l'intérêt supérieur de l'enfant.

4. Lorsque la séparation résulte de mesures prises par un État partie, telles que la détention, l'emprisonnement, l'exil, l'expulsion ou la mort (y compris la mort, quelle qu'en soit la cause, survenue en cours de détention) des deux parents ou de l'un d'eux, ou de l'enfant, l'État partie donne sur demande aux parents, à l'enfant ou, s'il y a lieu, à un autre membre de la famille les renseignements

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with the essential information concerning the whereabouts of the absent member(s) of the family unless the provision of the information would be detrimental to the well-being of the child. States Parties shall further ensure that the submission of such a request shall of itself entail no adverse consequences for the person(s) concerned.

Article 12

1. States Parties shall assure to the child who is capable of forming his or her own views the right to express those views freely in all matters affecting the child, the views of the child being given due weight in accordance with the age and maturity of the child.

2. For this purpose, the child shall in particular be provided the opportunity to be heard in any judicial and administrative proceedings affecting the child, either directly, or through a representative or an appropriate body, in a manner consistent with the procedural rules of national law.

III. Judgments

A. *Federal Court — Trial Division* (1995), 101 F.T.R. 110

8 Simpson J. delivered oral reasons dismissing the appellant's judicial review application. She held that since there were no reasons given by Officer Caden for his decision, no affidavit was provided, and no reasons were required, she would assume, in the absence of evidence to the contrary, that he acted in good faith and made a decision based on correct principles. She rejected the appellant's argument that the statement in Officer Lorenz's notes that Ms. Baker would be a strain on the welfare system was not supported by the evidence, holding that it was reasonable to conclude from the reports provided that Ms. Baker would not be able to return to work. She held that the language of Officer Lorenz did not raise a reasonable apprehension of bias, and also found that the views expressed in his notes were unimportant, because they were not those of the decision-maker, Officer Caden. She rejected the appellant's argument that the *Convention on the Rights of the Child* mandated that the appellant's interests be given priority in s. 114(2) decisions, holding that the Convention did not apply to this situation, and was not part of domestic law. She also held that the evidence

essentiels sur le lieu où se trouvent le membre ou les membres de la famille, à moins que la divulgation de ces renseignements ne soit préjudiciable au bien-être de l'enfant. Les États parties veillent en outre à ce que la présentation d'une telle demande n'entraîne pas en elle-même de conséquences fâcheuses pour la personne ou les personnes intéressées.

Article 12

1. Les États parties garantissent à l'enfant qui est capable de discernement le droit d'exprimer librement son opinion sur toute question l'intéressant, les opinions de l'enfant étant dûment prises en considération eu égard à son âge et à son degré de maturité.

2. À cette fin, on donnera notamment à l'enfant la possibilité d'être entendu dans toute procédure judiciaire ou administrative l'intéressant, soit directement, soit par l'intermédiaire d'un représentant ou d'un organisme approprié, de façon compatible avec les règles de procédure de la législation nationale.

III. Les jugements

A. *Cour fédérale — Section de première instance* (1995), 101 F.T.R. 110

Le juge Simpson a prononcé à l'audience les motifs rejetant la demande de contrôle judiciaire de l'appelante. Elle a statué que, puisque l'agent Caden n'avait pas motivé sa décision, qu'aucun affidavit n'avait été fourni, et qu'aucun motif n'était requis, elle présumerait, en l'absence de preuve contraire, qu'il avait agi de bonne foi et avait rendu la décision en se fondant sur des principes appropriés. Elle a rejeté l'argument de l'appelante selon lequel l'affirmation dans les notes de l'agent Lorenz que M^me^ Baker serait un fardeau pour le système d'aide sociale n'était pas étayée par la preuve, concluant qu'il était raisonnable de conclure au vu des rapports fournis que M^me^ Baker ne pourrait pas reprendre le travail. Elle a conclu que le langage de l'agent Lorenz ne donnait pas lieu à une crainte raisonnable de partialité, et a également conclu que les opinions exprimées dans ses notes étaient sans importance parce qu'elles n'étaient pas celles du décideur, l'agent Caden. Elle a rejeté l'argument de l'appelante selon lequel la *Convention relative aux droits de l'enfant* commandait que l'intérêt de l'appelante prime dans les décisions fondées sur le par. 114(2), concluant que

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showed the children were a significant factor in the decision-making process. She rejected the appellant's submission that the Convention gave rise to a legitimate expectation that the children's interests would be a primary consideration in the decision.

Simpson J. certified the following as a "serious question of general importance" under s. 83(1) of the *Immigration Act*: "Given that the Immigration Act does not expressly incorporate the language of Canada's international obligations with respect to the International Convention on the Rights of the Child, must federal immigration authorities treat the best interests of the Canadian child as a primary consideration in assessing an applicant under s. 114(2) of the *Immigration Act*?"

B. *Federal Court of Appeal*, [1997] 2 F.C. 127

The reasons of the Court of Appeal were delivered by Strayer J.A. He held that pursuant to s. 83(1) of the *Immigration Act*, the appeal was limited to the question certified by Simpson J. He also rejected the appellant's request to challenge the constitutional validity of s. 83(1). Strayer J.A. noted that a treaty cannot have legal effect in Canada unless implemented through domestic legislation, and that the Convention had not been adopted in either federal or provincial legislation. He held that although legislation should be interpreted, where possible, to avoid conflicts with Canada's international obligations, interpreting s. 114(2) to require that the discretion it provides for must be exercised in accordance with the Convention would interfere with the separation of powers between the executive and legislature. He held that such a principle could also alter rights and obligations within the jurisdiction of provincial legislatures. Strayer J.A. also rejected the argument that any articles of the Convention could be interpreted to impose an obligation upon the government to give primacy to the interests of the children in a proceeding such as deportation. He

la Convention ne s'appliquait pas à cette situation, et ne faisait pas partie du droit interne. Elle a également conclu que la preuve démontrait que les enfants avaient constitué un facteur important dans le processus décisionnel et a rejeté l'argument de l'appelante selon lequel la Convention donnait lieu à une attente légitime que l'intérêt des enfants serait une considération primordiale dans la décision.

9 Le juge Simpson a certifié la question suivante comme «question grave de portée générale» en vertu du par. 83(1) de la *Loi sur l'immigration*: «Vu que la Loi sur l'immigration n'incorpore pas expressément le langage des obligations internationales du Canada en ce qui concerne la Convention internationale relative aux droits de l'enfant, les autorités d'immigration fédérales doivent-elles considérer l'intérêt supérieur de l'enfant né au Canada comme une considération primordiale dans l'examen du cas d'un requérant sous le régime du par. 114(2) de la *Loi sur l'immigration*?»

B. *Cour d'appel fédérale*, [1997] 2 C.F. 127

10 Les motifs de la Cour d'appel sont exposés par le juge Strayer. Il déclare que, conformément au par. 83(1) de la *Loi sur l'immigration*, l'appel est limité à la question certifiée par le juge Simpson. Il rejette également la contestation par l'appelante de la constitutionnalité du par. 83(1). Le juge Strayer note qu'un traité ne peut pas avoir d'effet juridique au Canada s'il n'a pas été mis en vigueur par une loi adoptée à cet effet, et que la Convention n'avait pas été adoptée par une loi fédérale ou provinciale. Il conclut que, bien que la loi doive, dans la mesure du possible, être interprétée de façon à ne pas entraîner de conflit avec les obligations internationales du Canada, dire que le par. 114(2) exige que le pouvoir discrétionnaire conféré s'exerce conformément à la Convention enfreindrait la séparation des pouvoirs entre l'exécutif et le législatif. Il conclut qu'un tel principe pourrait également toucher des droits et obligations relevant de la compétence des législatures provinciales. Le juge Strayer rejette également l'argument selon lequel quelque article de la Convention peut s'interpréter de façon à imposer l'obligation au gouvernement d'accorder priorité à l'intérêt des

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held that the deportation of a parent was not a decision "concerning" children within the meaning of article 3. Finally, Strayer J.A. considered the appellant's argument based on the doctrine of legitimate expectations. He noted that because the doctrine does not create substantive rights, and because a requirement that the best interests of the children be given primacy by a decision-maker under s. 114(2) would be to create a substantive right, the doctrine did not apply.

IV. Issues

11 Because, in my view, the issues raised can be resolved under the principles of administrative law and statutory interpretation, I find it unnecessary to consider the various *Charter* issues raised by the appellant and the interveners who supported her position. The issues raised by this appeal are therefore as follows:

(1) What is the legal effect of a stated question under s. 83(1) of the *Immigration Act* on the scope of appellate review?

(2) Were the principles of procedural fairness violated in this case?

(i) Were the participatory rights accorded consistent with the duty of procedural fairness?

(ii) Did the failure of Officer Caden to provide his own reasons violate the principles of procedural fairness?

(iii) Was there a reasonable apprehension of bias in the making of this decision?

(3) Was this discretion improperly exercised because of the approach taken to the interests of Ms. Baker's children?

I note that it is the third issue that raises directly the issues contained in the certified question of general importance stated by Simpson J.

enfants dans une procédure comme l'expulsion. Il conclut que l'expulsion du père ou de la mère n'est pas une décision «concernant» les enfants au sens de l'article 3. Enfin, le juge Strayer, examinant l'argument de l'appelante fondé sur la doctrine de l'attente légitime, conclut que puisque l'attente légitime ne crée aucun droit matériel et que le fait d'exiger qu'un décideur donne priorité à l'intérêt supérieur des enfants sous le régime du par. 114(2) aurait pour effet de créer un droit matériel, la doctrine ne s'appliquait pas.

IV. Les questions en litige

Comme, à mon avis, l'appel peut être tranché en vertu des principes du droit administratif et de l'interprétation des lois, il n'est pas nécessaire d'examiner les divers moyens fondés sur la *Charte* qui ont été invoqués par l'appelante et les intervenants qui l'ont appuyée. Par conséquent, les questions examinées sont les suivantes:

(1) Quel effet juridique la question énoncée aux termes du par. 83(1) de la *Loi sur l'immigration* a-t-elle sur la portée de l'examen en appel?

(2) Les principes d'équité procédurale ont-ils été enfreints en l'espèce?

(i) Les droits de participation accordés étaient-ils compatibles avec l'obligation d'équité procédurale?

(ii) Le défaut de l'agent Caden d'exposer les motifs de sa décision a-t-il enfreint les principes d'équité procédurale?

(iii) Y avait-il une crainte raisonnable de partialité dans la prise de cette décision?

(3) Le pouvoir discrétionnaire a-t-il été incorrectement exercé en raison de la façon d'aborder l'intérêt des enfants de M^me^ Baker?

Je note que c'est la troisième question qui soulève directement les points mentionnés dans la question certifiée de portée générale énoncée par le juge Simpson.

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V. Analysis

A. *Stated Questions Under Section 83(1) of the Immigration Act*

The Court of Appeal held, in accordance with its decision in *Liyanagamage v. Canada (Minister of Citizenship and Immigration)* (1994), 176 N.R. 4, that the requirement, in s. 83(1), that a "serious question of general importance" be certified for an appeal to be permitted restricts an appeal court to addressing the issues raised by the certified question. However, in *Pushpanathan v. Canada (Minister of Citizenship and Immigration)*, [1998] 1 S.C.R. 982, at para. 25, this Court held that s. 83(1) does not require that the Court of Appeal address only the stated question and issues related to it:

> The certification of a "question of general importance" is the trigger by which an appeal is justified. The object of the appeal is still the judgment itself, not merely the certified question.

Rothstein J. noted in *Ramoutar v. Canada (Minister of Employment and Immigration)*, [1993] 3 F.C. 370 (T.D.), that once a question has been certified, all aspects of the appeal may be considered by the Court of Appeal, within its jurisdiction. I agree. The wording of s. 83(1) suggests, and *Pushpanathan* confirms, that if a "question of general importance" has been certified, this allows for an appeal from the judgment of the Trial Division which would otherwise not be permitted, but does not confine the Court of Appeal or this Court to answering the stated question or issues directly related to it. All issues raised by the appeal may therefore be considered here.

B. *The Statutory Scheme and the Nature of the Decision*

Before examining the various grounds for judicial review, it is appropriate to discuss briefly the nature of the decision made under s. 114(2) of the *Immigration Act*, the role of this decision in the statutory scheme, and the guidelines given by the Minister to immigration officers in relation to it.

V. Analyse

A. *Les questions énoncées en vertu du par. 83(1) de la Loi sur l'immigration*

La Cour d'appel a conclu, conformément à son arrêt *Liyanagamage c. Canada (Ministre de la Citoyenneté et de l'Immigration)* (1994), 176 N.R. 4, que le par. 83(1), en exigeant qu'une «question grave de portée générale» soit certifiée pour qu'un appel puisse être autorisé, limite l'appel aux questions soulevées par la question certifiée. Toutefois, dans l'arrêt *Pushpanathan c. Canada (Ministre de la Citoyenneté et de l'Immigration)*, [1998] 1 R.C.S. 982, au par. 25, notre Cour a conclu que le par. 83(1) n'exige pas que la Cour d'appel traite uniquement de la question énoncée et des points qui s'y rapportent: 12

> Sans la certification d'une «question grave de portée générale», l'appel ne serait pas justifié. L'objet de l'appel est bien le jugement lui-même, et non simplement la question certifiée.

Le juge Rothstein dit, dans le jugement *Ramoutar c. Canada (Ministre de l'Emploi et de l'Immigration)*, [1993] 3 C.F. 370 (1re inst.), que lorsqu'une question a été certifiée, la Cour d'appel peut examiner tous les aspects de l'appel qui relèvent de sa compétence. Je suis d'accord. Le libellé du par. 83(1) indique, et l'arrêt *Pushpanathan* le confirme, que la certification d'une «question grave de portée générale» permet un appel du jugement de première instance qui, normalement, ne serait pas autorisé, mais ne limite pas la Cour d'appel ni notre Cour à la question énoncée ou aux points qui s'y rapportent directement. Par conséquent, nous pouvons examiner tous les points soulevés dans le pourvoi.

B. *Le régime législatif et la nature de la décision*

Avant d'examiner les divers moyens invoqués dans la demande de contrôle judiciaire, il est nécessaire d'aborder brièvement la nature de la décision rendue en vertu du par. 114(2) de la *Loi sur l'immigration*, du rôle que joue cette décision dans le régime législatif, et des directives données par le ministre aux agents d'immigration à ce sujet. 13

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14 Section 114(2) itself authorizes the Governor in Council to authorize the Minister to exempt a person from a regulation made under the Act, or to facilitate the admission to Canada of any person. The Minister's power to grant an exemption based on humanitarian and compassionate (H & C) considerations arises from s. 2.1 of the *Immigration Regulations*, which I reproduce for convenience:

> The Minister is hereby authorized to exempt any person from any regulation made under subsection 114(1) of the Act or otherwise facilitate the admission to Canada of any person where the Minister is satisfied that the person should be exempted from that regulation or that the person's admission should be facilitated owing to the existence of compassionate or humanitarian considerations.

For the purpose of clarity, I will refer throughout these reasons to decisions made pursuant to the combination of s. 114(2) of the Act and s. 2.1 of the Regulations as "H & C decisions".

15 Applications for permanent residence must, as a general rule, be made from outside Canada, pursuant to s. 9(1) of the Act. One of the exceptions to this is when admission is facilitated owing to the existence of compassionate or humanitarian considerations. In law, pursuant to the Act and the Regulations, an H & C decision is made by the Minister, though in practice, this decision is dealt with in the name of the Minister by immigration officers: see, for example, *Minister of Employment and Immigration v. Jiminez-Perez*, [1984] 2 S.C.R. 565, at p. 569. In addition, while in law, the H & C decision is one that provides for an exemption from regulations or from the Act, in practice, it is one that, in cases like this one, determines whether a person who has been in Canada but does not have status can stay in the country or will be required to leave a place where he or she has become established. It is an important decision that affects in a fundamental manner the future of individuals' lives. In addition, it may also have an important impact on the lives of any Canadian children of the person whose humanitarian and compassionate application is being considered, since they may be separated from one of their parents and/or uprooted from their country of

Le paragraphe 114(2) habilite le gouverneur en conseil à autoriser le ministre à accorder une dispense d'application d'un règlement pris aux termes de la Loi, ou à faciliter l'admission d'une personne au Canada. Le pouvoir du ministre d'accorder une dispense pour des raisons d'ordre humanitaire découle de l'art. 2.1 du *Règlement sur l'immigration*:

> Le ministre est autorisé à accorder, pour des raisons d'ordre humanitaire, une dispense d'application d'un règlement pris aux termes du paragraphe 114(1) de la Loi ou à faciliter l'admission au Canada de toute autre manière.

Pour plus de clarté, je référerai aux décisions rendues conformément à une combinaison du par. 114(2) de la Loi et de l'art. 2.1 du règlement de «décisions d'ordre humanitaire».

Les demandes de résidence permanente doivent normalement être présentées à l'extérieur du Canada, conformément au par. 9(1) de la Loi. L'une des exceptions à cette règle est l'admission fondée sur des raisons d'ordre humanitaire. En droit, conformément à la Loi et au règlement, c'est le ministre qui prend les décisions d'ordre humanitaire, alors qu'en pratique, ces décisions sont prises en son nom par des agents d'immigration: voir, par exemple, *Ministre de l'Emploi et de l'Immigration c. Jiminez-Perez*, [1984] 2 R.C.S. 565, à la p. 569. En outre, même si, en droit, une décision d'ordre humanitaire est une décision qui prévoit une dispense d'application du règlement ou de la Loi, en pratique, il s'agit d'une décision, dans des affaires comme celle dont nous sommes saisis, qui détermine si une personne qui est au Canada, mais qui n'a pas de statut, peut y demeurer ou sera tenue de quitter l'endroit où elle s'est établie. Il s'agit d'une décision importante qui a des conséquences capitales sur l'avenir des personnes visées. Elle peut également avoir des répercussions importantes sur la vie des enfants canadiens de la personne qui a fait la demande fondée sur des raisons d'ordre humanitaire puisqu'ils peuvent être séparés d'un de leurs parents ou déracinés de leur pays de

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citizenship, where they have settled and have connections.

Immigration officers who make H & C decisions are provided with a set of guidelines, contained in chapter 9 of the *Immigration Manual: Examination and Enforcement*. The guidelines constitute instructions to immigration officers about how to exercise the discretion delegated to them. These guidelines are also available to the public. A number of statements in the guidelines are relevant to Ms. Baker's application. Guideline 9.05 emphasizes that officers have a duty to decide which cases should be given a favourable recommendation, by carefully considering all aspects of the case, using their best judgment and asking themselves what a reasonable person would do in such a situation. It also states that although officers are not expected to "delve into areas which are not presented during examination or interviews, they should attempt to clarify possible humanitarian grounds and public policy considerations even if these are not well articulated".

The guidelines also set out the bases upon which the discretion conferred by s. 114(2) and the Regulations should be exercised. Two different types of criteria that may lead to a positive s. 114(2) decision are outlined — public policy considerations and humanitarian and compassionate grounds. Immigration officers are instructed, under guideline 9.07, to assure themselves, first, whether a public policy consideration is present, and if there is none, whether humanitarian and compassionate circumstances exist. Public policy reasons include marriage to a Canadian resident, the fact that the person has lived in Canada, has become established, and has become an "illegal de facto resident", and the fact that the person may be a long-term holder of employment authorization or has worked as a foreign domestic. Guideline 9.07 states that humanitarian and compassionate grounds will exist if "unusual, undeserved or disproportionate hardship would be caused to the person seeking consideration if he or she had to leave Canada". The guidelines also directly address

citoyenneté, où ils se sont installés et ont des attaches.

16 Les agents d'immigration qui prennent des décisions d'ordre humanitaire reçoivent une série de lignes directrices, figurant au chapitre 9 du *Guide de l'immigration: examen et application de la loi*, qui leur servent d'instructions sur la façon d'exercer le pouvoir discrétionnaire qui leur est délégué. Le public a aussi accès à ces lignes directrices. Dans ces lignes directrices, plusieurs énoncés s'appliquent à la demande de M^me^ Baker. La directive 9.05 met l'accent sur le devoir des agents de décider quelles affaires devraient recevoir une recommandation favorable, en étudiant avec soin les cas sous tous leurs aspects, en faisant preuve de discernement, et en se demandant ce qu'une personne sensée ferait dans une telle situation. Elle dit également que les agents ne doivent pas «tente[r] d'approfondir des questions qui ne sont pas soulevées au cours des examens ou des entrevues. Toutefois, ils doivent essayer d'obtenir des précisions relativement à des raisons possibles d'intérêt public ou d'ordre humanitaire, même si celles-ci ne sont pas clairement formulées».

17 Ces directives définissent également les fondements de l'exercice du pouvoir discrétionnaire conféré par le par. 114(2) et le règlement. Deux types de raisons pouvant mener à une décision favorable sont indiqués — les raisons d'intérêt public et les considérations humanitaires. Conformément à la directive 9.07, les agents d'immigration doivent s'assurer d'abord qu'il n'existe pas de raisons d'intérêt public, et, s'il n'y en a pas, s'il existe des considérations humanitaires. Les raisons d'intérêt public comprennent, notamment, le mariage à un résident du Canada, le fait qu'une personne a vécu au Canada, s'y est établie et est devenue un résident «de fait en situation administrative irrégulière», et le fait que la personne est titulaire d'un permis de travail de longue date ou a travaillé comme travailleur domestique étranger. La directive 9.07 dit qu'il existe des considérations humanitaires lorsque «des difficultés inhabituelles, injustes ou indues seraient causées à la personne sollicitant l'examen de son cas si celle-ci devait quitter le Canada». Les directives traitent expressé-

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situations involving family dependency, and emphasize that the requirement that a person leave Canada to apply from abroad may result in hardship for close family members of a Canadian resident, whether parents, children, or others who are close to the claimant, but not related by blood. They note that in such cases, the reasons why the person did not apply from abroad and the existence of family or other support in the person's home country should also be considered.

ment de situations où il existe des liens familiaux de dépendance, et soulignent que l'obligation de quitter le Canada pour présenter une demande de l'étranger peut occasionner des difficultés à certains membres de la famille proche d'un résident canadien, parents, enfants ou autres proches qui n'ont pas de liens de sang avec le demandeur. Elles précisent que dans de tels cas, il faut aussi tenir compte des raisons pour lesquelles la personne n'a pas présenté sa demande à l'étranger et de la présence d'une famille ou d'autres personnes susceptibles de l'aider dans son pays d'origine.

C. *Procedural Fairness*

C. *L'équité procédurale*

18 The first ground upon which the appellant challenges the decision made by Officer Caden is the allegation that she was not accorded procedural fairness. She suggests that the following procedures are required by the duty of fairness when parents have Canadian children and they make an H & C application: an oral interview before the decision-maker, notice to her children and the other parent of that interview, a right for the children and the other parent to make submissions at that interview, and notice to the other parent of the interview and of that person's right to have counsel present. She also alleges that procedural fairness requires the provision of reasons by the decision-maker, Officer Caden, and that the notes of Officer Lorenz give rise to a reasonable apprehension of bias.

Comme premier moyen pour contester la décision de l'agent Caden, l'appelante allègue qu'elle n'a pas bénéficié de l'équité procédurale. L'appelante estime que l'obligation d'agir équitablement exige le respect des procédures suivantes quand des parents ayant des enfants canadiens présentent une demande fondée sur des raisons d'ordre humanitaire: une entrevue orale devant le décideur, un avis de la tenue de cette entrevue aux enfants et à l'autre parent, un droit pour les enfants et l'autre parent de présenter des arguments au cours de cette entrevue, un avis à l'autre parent de la tenue de l'entrevue et du droit de cette personne d'être représentée par un avocat. Elle allègue également que l'équité procédurale exige que le décideur, soit l'agent Caden, motive sa décision, et que les notes de l'agent Lorenz donnent lieu à une crainte raisonnable de partialité.

19 In addressing the fairness issues, I will consider first the principles relevant to the determination of the content of the duty of procedural fairness, and then address Ms. Baker's arguments that she was accorded insufficient participatory rights, that a duty to give reasons existed, and that there was a reasonable apprehension of bias.

En traitant des questions d'équité, j'examinerai d'abord les principes applicables à la détermination de la nature de l'obligation d'équité procédurale, et ensuite les arguments de M^me^ Baker sur l'insuffisance des droits de participation qui lui ont été accordés, sur l'existence d'une obligation de motiver la décision et sur la crainte raisonnable de partialité.

20 Both parties agree that a duty of procedural fairness applies to H & C decisions. The fact that a decision is administrative and affects "the rights, privileges or interests of an individual" is sufficient to trigger the application of the duty of fairness: *Cardinal v. Director of Kent Institution,*

Les deux parties admettent que l'obligation d'équité procédurale s'applique aux décisions d'ordre humanitaire. Le fait qu'une décision soit administrative et touche «les droits, privilèges ou biens d'une personne» suffit pour entraîner l'application de l'obligation d'équité: *Cardinal c.*

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[1985] 2 S.C.R. 643, at p. 653. Clearly, the determination of whether an applicant will be exempted from the requirements of the Act falls within this category, and it has been long recognized that the duty of fairness applies to H & C decisions: *Sobrie v. Canada (Minister of Employment and Immigration)* (1987), 3 Imm. L.R. (2d) 81 (F.C.T.D.), at p. 88; *Said v. Canada (Minister of Employment and Immigration)* (1992), 6 Admin. L.R. (2d) 23 (F.C.T.D.); *Shah v. Minister of Employment and Immigration* (1994), 170 N.R. 238 (F.C.A.).

(1) Factors Affecting the Content of the Duty of Fairness

The existence of a duty of fairness, however, does not determine what requirements will be applicable in a given set of circumstances. As I wrote in *Knight v. Indian Head School Division No. 19*, [1990] 1 S.C.R. 653, at p. 682, "the concept of procedural fairness is eminently variable and its content is to be decided in the specific context of each case". All of the circumstances must be considered in order to determine the content of the duty of procedural fairness: *Knight*, at pp. 682-83; *Cardinal*, *supra*, at p. 654; *Old St. Boniface Residents Assn. Inc. v. Winnipeg (City)*, [1990] 3 S.C.R. 1170, *per* Sopinka J.

Although the duty of fairness is flexible and variable, and depends on an appreciation of the context of the particular statute and the rights affected, it is helpful to review the criteria that should be used in determining what procedural rights the duty of fairness requires in a given set of circumstances. I emphasize that underlying all these factors is the notion that the purpose of the participatory rights contained within the duty of procedural fairness is to ensure that administrative decisions are made using a fair and open procedure, appropriate to the decision being made and its statutory, institutional, and social context, with an opportunity for those affected by the decision to put forward their views and evidence fully and have them considered by the decision-maker.

Directeur de l'établissement Kent, [1985] 2 R.C.S. 643, à la p. 653. Il est évident que la décision quant à savoir si un demandeur sera dispensé des exigences prévues par la Loi entre dans cette catégorie, et il est admis depuis longtemps que l'obligation d'équité s'applique aux décisions d'ordre humanitaire: *Sobrie c. Canada (Ministre de l'Emploi et de l'Immigration)* (1987), 3 Imm. L.R. (2d) 81 (C.F. 1re inst.), à la p. 88; *Said c. Canada (Ministre de l'Emploi et de l'Immigration)* (1992), 6 Admin. L.R. (2d) 23 (C.F. 1re inst.); *Shah c. Ministre de l'Emploi et de l'Immigration* (1994), 170 N.R. 238 (C.A.F.).

(1) Les facteurs ayant une incidence sur la nature de l'obligation d'équité

21 L'existence de l'obligation d'équité, toutefois, ne détermine pas quelles exigences s'appliqueront dans des circonstances données. Comme je l'écrivais dans l'arrêt *Knight c. Indian Head School Division No. 19*, [1990] 1 R.C.S. 653, à la p. 682, «la notion d'équité procédurale est éminemment variable et son contenu est tributaire du contexte particulier de chaque cas». Il faut tenir compte de toutes les circonstances pour décider de la nature de l'obligation d'équité procédurale: *Knight*, aux pp. 682 et 683; *Cardinal*, précité, à la p. 654; *Assoc. des résidents du Vieux St-Boniface Inc. c. Winnipeg (Ville)*, [1990] 3 R.C.S. 1170, le juge Sopinka.

22 Bien que l'obligation d'équité soit souple et variable et qu'elle repose sur une appréciation du contexte de la loi particulière et des droits visés, il est utile d'examiner les critères à appliquer pour définir les droits procéduraux requis par l'obligation d'équité dans des circonstances données. Je souligne que l'idée sous-jacente à tous ces facteurs est que les droits de participation faisant partie de l'obligation d'équité procédurale visent à garantir que les décisions administratives sont prises au moyen d'une procédure équitable et ouverte, adaptée au type de décision et à son contexte légal institutionnel et social, comprenant la possibilité donnée aux personnes visées par la décision de présenter leur points de vue complètement ainsi que des éléments de preuve de sorte qu'ils soient considérés par le décideur.

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23 Several factors have been recognized in the jurisprudence as relevant to determining what is required by the common law duty of procedural fairness in a given set of circumstances. One important consideration is the nature of the decision being made and the process followed in making it. In *Knight*, *supra*, at p. 683, it was held that "the closeness of the administrative process to the judicial process should indicate how much of those governing principles should be imported into the realm of administrative decision making". The more the process provided for, the function of the tribunal, the nature of the decision-making body, and the determinations that must be made to reach a decision resemble judicial decision making, the more likely it is that procedural protections closer to the trial model will be required by the duty of fairness. See also *Old St. Boniface*, *supra*, at p. 1191; *Russell v. Duke of Norfolk*, [1949] 1 All E.R. 109 (C.A.), at p. 118; *Syndicat des employés de production du Québec et de l'Acadie v. Canada (Canadian Human Rights Commission*), [1989] 2 S.C.R. 879, at p. 896, *per* Sopinka J.

La jurisprudence reconnaît plusieurs facteurs pertinents en ce qui a trait aux exigences de l'obligation d'équité procédurale en common law dans des circonstances données. Un facteur important est la nature de la décision recherchée et le processus suivi pour y parvenir. Dans l'arrêt *Knight*, précité, à la p. 683, on a conclu que «la mesure dans laquelle le processus administratif se rapproche du processus judiciaire est de nature à indiquer jusqu'à quel point ces principes directeurs devraient s'appliquer dans le domaine de la prise de décisions administratives». Plus le processus prévu, la fonction du tribunal, la nature de l'organisme rendant la décision et la démarche à suivre pour parvenir à la décision ressemblent à une prise de décision judiciaire, plus il est probable que l'obligation d'agir équitablement exigera des protections procédurales proches du modèle du procès. Voir également *Vieux St-Boniface*, précité, à la p. 1191; *Russell c. Duke of Norfolk*, [1949] 1 All E.R. 109 (C.A.), à la p. 118; *Syndicat des employés de production du Québec et de l'Acadie c. Canada (Commission canadienne des droits de la personne)*, [1989] 2 R.C.S. 879, à la p. 896, le juge Sopinka.

24 A second factor is the nature of the statutory scheme and the "terms of the statute pursuant to which the body operates": *Old St. Boniface*, *supra*, at p. 1191. The role of the particular decision within the statutory scheme and other surrounding indications in the statute help determine the content of the duty of fairness owed when a particular administrative decision is made. Greater procedural protections, for example, will be required when no appeal procedure is provided within the statute, or when the decision is determinative of the issue and further requests cannot be submitted: see D. J. M. Brown and J. M. Evans, *Judicial Review of Administrative Action in Canada* (loose-leaf), at pp. 7-66 to 7-67.

Le deuxième facteur est la nature du régime législatif et les «termes de la loi en vertu de laquelle agit l'organisme en question»: *Vieux St-Boniface*, précité, à la p. 1191. Le rôle que joue la décision particulière au sein du régime législatif, et d'autres indications qui s'y rapportent dans la loi, aident à définir la nature de l'obligation d'équité dans le cadre d'une décision administrative précise. Par exemple, des protections procédurales plus importantes seront exigées lorsque la loi ne prévoit aucune procédure d'appel, ou lorsque la décision est déterminante quant à la question en litige et qu'il n'est plus possible de présenter d'autres demandes: voir D. J. M. Brown et J. M. Evans, *Judicial Review of Administrative Action in Canada* (feuilles mobiles), aux pp. 7-66 et 7-67.

25 A third factor in determining the nature and extent of the duty of fairness owed is the importance of the decision to the individual or individuals affected. The more important the decision is to the lives of those affected and the greater its

Le troisième facteur permettant de définir la nature et l'étendue de l'obligation d'équité est l'importance de la décision pour les personnes visées. Plus la décision est importante pour la vie des personnes visées et plus ses répercussions sont

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impact on that person or those persons, the more stringent the procedural protections that will be mandated. This was expressed, for example, by Dickson J. (as he then was) in *Kane v. Board of Governors of the University of British Columbia*, [1980] 1 S.C.R. 1105, at p. 1113:

> A high standard of justice is required when the right to continue in one's profession or employment is at stake. . . . A disciplinary suspension can have grave and permanent consequences upon a professional career.

As Sedley J. (now Sedley L.J.) stated in *R. v. Higher Education Funding Council, ex parte Institute of Dental Surgery*, [1994] 1 All E.R. 651 (Q.B.), at p. 667:

> In the modern state the decisions of administrative bodies can have a more immediate and profound impact on people's lives than the decisions of courts, and public law has since *Ridge v. Baldwin* [1963] 2 All E.R. 66, [1964] A.C. 40 been alive to that fact. While the judicial character of a function may elevate the practical requirements of fairness above what they would otherwise be, for example by requiring contentious evidence to be given and tested orally, what makes it "judicial" in this sense is principally the nature of the issue it has to determine, not the formal status of the deciding body.

The importance of a decision to the individuals affected, therefore, constitutes a significant factor affecting the content of the duty of procedural fairness.

Fourth, the legitimate expectations of the person challenging the decision may also determine what procedures the duty of fairness requires in given circumstances. Our Court has held that, in Canada, this doctrine is part of the doctrine of fairness or natural justice, and that it does not create substantive rights: *Old St. Boniface*, *supra*, at p. 1204; *Reference re Canada Assistance Plan (B.C.)*, [1991] 2 S.C.R. 525, at p. 557. As applied in Canada, if a legitimate expectation is found to exist, this will affect the content of the duty of fairness owed to the individual or individuals affected by the decision. If the claimant has a legitimate expectation that a certain procedure will be followed, this procedure will be required by the duty

grandes pour ces personnes, plus les protections procédurales requises seront rigoureuses. C'est ce que dit par exemple le juge Dickson (plus tard Juge en chef) dans l'arrêt *Kane c. Conseil d'administration de l'Université de la Colombie-Britannique*, [1980] 1 R.C.S. 1105, à la p. 1113:

> Une justice de haute qualité est exigée lorsque le droit d'une personne d'exercer sa profession ou de garder son emploi est en jeu. [. . .] Une suspension de nature disciplinaire peut avoir des conséquences graves et permanentes sur une carrière.

Comme le juge Sedley (maintenant Lord juge Sedley) le dit dans *R. c. Higher Education Funding Council, ex parte Institute of Dental Surgery*, [1994] 1 All E.R. 651 (Q.B.), à la p. 667:

> [TRADUCTION] Dans le monde moderne, les décisions rendues par des organismes administratifs peuvent avoir un effet plus immédiat et plus important sur la vie des gens que les décisions des tribunaux et le droit public a depuis l'arrêt *Ridge c. Baldwin* [1963] 2 All E.R. 66, [1964] A.C. 40, reconnu ce fait. Bien que le caractère judiciaire d'une fonction puisse élever les exigences pratiques en matière d'équité au-delà de ce qu'elles seraient autrement, par exemple en exigeant que soit présenté et vérifié oralement un élément de preuve contesté, ce qui le rend «judiciaire» dans ce sens est principalement la nature de la question à trancher, et non le statut formel de l'organisme décisionnel.

L'importance d'une décision pour les personnes visées a donc une incidence significative sur la nature de l'obligation d'équité procédurale.

26 Quatrièmement, les attentes légitimes de la personne qui conteste la décision peuvent également servir à déterminer quelles procédures l'obligation d'équité exige dans des circonstances données. Notre Cour a dit que, au Canada, l'attente légitime fait partie de la doctrine de l'équité ou de la justice naturelle, et qu'elle ne crée pas de droits matériels: *Vieux St-Boniface*, précité, à la p. 1204; *Renvoi relatif au Régime d'assistance publique du Canada (C.-B.)*, [1991] 2 R.C.S. 525, à la p. 557. Au Canada, la reconnaissance qu'une attente légitime existe aura une incidence sur la nature de l'obligation d'équité envers les personnes visées par la décision. Si le demandeur s'attend légitimement à ce qu'une certaine procédure soit suivie, l'obliga-

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of fairness: *Qi v. Canada (Minister of Citizenship and Immigration)* (1995), 33 Imm. L.R. (2d) 57 (F.C.T.D.); *Mercier-Néron v. Canada (Minister of National Health and Welfare)* (1995), 98 F.T.R. 36; *Bendahmane v. Canada (Minister of Employment and Immigration)*, [1989] 3 F.C. 16 (C.A.). Similarly, if a claimant has a legitimate expectation that a certain result will be reached in his or her case, fairness may require more extensive procedural rights than would otherwise be accorded: D. J. Mullan, *Administrative Law* (3rd ed. 1996), at pp. 214-15; D. Shapiro, "Legitimate Expectation and its Application to Canadian Immigration Law" (1992), 8 *J.L. & Social Pol'y* 282, at p. 297; *Canada (Attorney General) v. Human Rights Tribunal Panel (Canada)* (1994), 76 F.T.R. 1. Nevertheless, the doctrine of legitimate expectations cannot lead to substantive rights outside the procedural domain. This doctrine, as applied in Canada, is based on the principle that the "circumstances" affecting procedural fairness take into account the promises or regular practices of administrative decision-makers, and that it will generally be unfair for them to act in contravention of representations as to procedure, or to backtrack on substantive promises without according significant procedural rights.

27 Fifth, the analysis of what procedures the duty of fairness requires should also take into account and respect the choices of procedure made by the agency itself, particularly when the statute leaves to the decision-maker the ability to choose its own procedures, or when the agency has an expertise in determining what procedures are appropriate in the circumstances: Brown and Evans, *supra*, at pp. 7-66 to 7-70. While this, of course, is not determinative, important weight must be given to the choice of procedures made by the agency itself and its institutional constraints: *IWA v. Consolidated-Bathurst Packaging Ltd.*, [1990] 1 S.C.R. 282, *per* Gonthier J.

28 I should note that this list of factors is not exhaustive. These principles all help a court determine whether the procedures that were followed

tion d'équité exigera cette procédure: *Qi c. Canada (Ministre de la Citoyenneté et de l'Immigration)* (1995), 33 Imm. L.R. (2d) 57 (C.F. 1re inst.); *Mercier-Néron c. Canada (Ministre de la Santé nationale et du Bien-être social)* (1995), 98 F.T.R. 36; *Bendahmane c. Canada (Ministre de l'Emploi et de l'Immigration)*, [1989] 3 C.F. 16 (C.A.). De même, si un demandeur s'attend légitimement à un certain résultat, l'équité peut exiger des droits procéduraux plus étendus que ceux qui seraient autrement accordés: D. J. Mullan, *Administrative Law* (3e éd. 1996), aux pp. 214 et 215; D. Shapiro, «Legitimate Expectation and its Application to Canadian Immigration Law» (1992), 8 *J.L. & Social Pol'y* 282, à la p. 297; *Canada (Procureur général) c. Comité du tribunal des droits de la personne (Canada)* (1994), 76 F.T.R. 1. Néanmoins, la doctrine de l'attente légitime ne peut pas donner naissance à des droits matériels en dehors du domaine de la procédure. Cette doctrine, appliquée au Canada, est fondée sur le principe que les «circonstances» touchant l'équité procédurale comprennent les promesses ou pratiques habituelles des décideurs administratifs, et qu'il serait généralement injuste de leur part d'agir en contravention d'assurances données en matière de procédures, ou de revenir sur des promesses matérielles sans accorder de droits procéduraux importants.

Cinquièmement, l'analyse des procédures requises par l'obligation d'équité devrait également prendre en considération et respecter les choix de procédure que l'organisme fait lui-même, particulièrement quand la loi laisse au décideur la possibilité de choisir ses propres procédures, ou quand l'organisme a une expertise dans le choix des procédures appropriées dans les circonstances: Brown et Evans, *op. cit.*, aux pp. 7-66 à 7-70. Bien que, de toute évidence, cela ne soit pas déterminant, il faut accorder une grande importance au choix de procédures par l'organisme lui-même et à ses contraintes institutionnelles: *IWA c. Consolidated-Bathurst Packaging Ltd.*, [1990] 1 R.C.S. 282, le juge Gonthier.

Je dois mentionner que cette liste de facteurs n'est pas exhaustive. Tous ces principes aident le tribunal à déterminer si les procédures suivies res-

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respected the duty of fairness. Other factors may also be important, particularly when considering aspects of the duty of fairness unrelated to participatory rights. The values underlying the duty of procedural fairness relate to the principle that the individual or individuals affected should have the opportunity to present their case fully and fairly, and have decisions affecting their rights, interests, or privileges made using a fair, impartial, and open process, appropriate to the statutory, institutional, and social context of the decision.

pectent l'obligation d'équité. D'autres facteurs peuvent également être importants, notamment dans l'examen des aspects de l'obligation d'agir équitablement non reliés aux droits de participation. Les valeurs qui sous-tendent l'obligation d'équité procédurale relèvent du principe selon lequel les personnes visées doivent avoir la possibilité de présenter entièrement et équitablement leur position, et ont droit à ce que les décisions touchant leurs droits, intérêts ou privilèges soient prises à la suite d'un processus équitable, impartial et ouvert, adapté au contexte légal, institutionnel et social de la décision.

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(2) Legitimate Expectations

(2) L'attente légitime

I turn now to an application of these principles to the circumstances of this case to determine whether the procedures followed respected the duty of procedural fairness. I will first determine whether the duty of procedural fairness that would otherwise be applicable is affected, as the appellant argues, by the existence of a legitimate expectation based upon the text of the articles of the Convention and the fact that Canada has ratified it. In my view, however, the articles of the Convention and their wording did not give rise to a legitimate expectation on the part of Ms. Baker that when the decision on her H & C application was made, specific procedural rights above what would normally be required under the duty of fairness would be accorded, a positive finding would be made, or particular criteria would be applied. This Convention is not, in my view, the equivalent of a government representation about how H & C applications will be decided, nor does it suggest that any rights beyond the participatory rights discussed below will be accorded. Therefore, in this case there is no legitimate expectation affecting the content of the duty of fairness, and the fourth factor outlined above therefore does not affect the analysis. It is unnecessary to decide whether an international instrument ratified by Canada could, in other circumstances, give rise to a legitimate expectation.

29 Je passe maintenant à une application de ces principes aux circonstances de l'espèce pour déterminer si les procédures suivies respectaient l'obligation d'équité procédurale. Je déciderai d'abord si l'existence d'une attente légitime fondée sur le texte des articles de la Convention et le fait que le Canada l'ait ratifiée a une incidence, comme l'appelante le soutient, sur l'obligation d'équité procédurale qui serait autrement applicable. À mon avis, les articles de la Convention et leur libellé n'ont pas créé chez M^me^ Baker l'attente légitime que sa demande fondée sur des raisons d'ordre humanitaire donne lieu à l'application de droits procéduraux particuliers autres que ceux qui seraient normalement exigés en vertu de l'obligation d'équité, à une conclusion positive, ou à l'utilisation de critères particuliers. Cette convention n'est pas, à mon avis, l'équivalent d'une déclaration gouvernementale sur la façon dont les demandes fondées sur des raisons d'ordre humanitaire doivent être tranchées, elle n'indique pas non plus que des droits autres que les droits de participation dont il est question ci-dessous seront accordés. Par conséquent, dans la présente affaire, il n'existe pas d'attente légitime ayant une incidence sur la nature de l'obligation d'équité et le quatrième facteur identifié plus haut n'affecte donc pas l'analyse. Il n'est pas nécessaire de décider si un instrument international ratifié par le Canada pourrait, dans d'autres circonstances, donner lieu à une attente légitime.

(3) Participatory Rights

30 The next issue is whether, taking into account the other factors related to the determination of the content of the duty of fairness, the failure to accord an oral hearing and give notice to Ms. Baker or her children was inconsistent with the participatory rights required by the duty of fairness in these circumstances. At the heart of this analysis is whether, considering all the circumstances, those whose interests were affected had a meaningful opportunity to present their case fully and fairly. The procedure in this case consisted of a written application with supporting documentation, which was summarized by the junior officer (Lorenz), with a recommendation being made by that officer. The summary, recommendation, and material was then considered by the senior officer (Caden), who made the decision.

31 Several of the factors described above enter into the determination of the type of participatory rights the duty of procedural fairness requires in the circumstances. First, an H & C decision is very different from a judicial decision, since it involves the exercise of considerable discretion and requires the consideration of multiple factors. Second, its role is also, within the statutory scheme, as an exception to the general principles of Canadian immigration law. These factors militate in favour of more relaxed requirements under the duty of fairness. On the other hand, there is no appeal procedure, although judicial review may be applied for with leave of the Federal Court — Trial Division. In addition, considering the third factor, this is a decision that in practice has exceptional importance to the lives of those with an interest in its result — the claimant and his or her close family members — and this leads to the content of the duty of fairness being more extensive. Finally, applying the fifth factor described above, the statute accords considerable flexibility to the Minister to decide on the proper procedure, and immigration officers, as a matter of practice, do not conduct interviews in all cases. The institutional practices and choices made by the Minister are significant, though of course not determinative

(3) Les droits de participation

La question suivante est de savoir si, compte tenu des autres facteurs déterminant la nature de l'obligation d'équité, le défaut d'accorder une audience et de donner avis à M^me^ Baker ou à ses enfants était incompatible avec les droits de participation qu'exige l'obligation d'équité dans ces circonstances. Au cœur de cette analyse, il faut se demander si, compte tenu de toutes les circonstances, les personnes dont les intérêts étaient en jeu ont eu une occasion valable de présenter leur position pleinement et équitablement. La procédure en l'espèce se composait d'une demande écrite accompagnée de documents justificatifs, résumée par l'agent subalterne (Lorenz) et transmise avec une recommandation faite par ce dernier. Le résumé, la recommandation et les documents ont alors été examinés par l'agent principal (Caden), qui a pris la décision.

Plusieurs des facteurs susmentionnés servent à déterminer quel type de droits de participation sont requis par l'obligation d'équité procédurale dans les circonstances. En premier lieu, une décision d'ordre humanitaire est très différente d'une décision judiciaire, car elle suppose l'exercice d'un pouvoir discrétionnaire étendu et l'examen de facteurs multiples. Deuxièmement, son rôle est aussi, dans le cadre du régime législatif, une exception aux principes généraux du droit canadien de l'immigration. Ces facteurs militent en faveur d'une application moins stricte de l'obligation d'équité. D'autre part, il n'existe pas de procédure d'appel, bien qu'il puisse y avoir un contrôle judiciaire sur autorisation de la Cour fédérale, Section de première instance. En outre, au vu du troisième facteur, il s'agit là d'une décision qui, en pratique, a une importance exceptionnelle sur la vie des personnes concernées — le demandeur et les membres de sa famille proche, ce qui accroît l'étendue de l'obligation d'équité. Enfin, appliquant le cinquième facteur ci-haut décrit, la loi donne au ministre une grande latitude pour décider de la procédure appropriée, et les agents d'immigration, dans la pratique, ne procèdent pas à des entrevues dans tous les cas. Les pratiques et les choix institutionnels que fait le ministre sont

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factors to be considered in the analysis. Thus, it can be seen that although some of the factors suggest stricter requirements under the duty of fairness, others suggest more relaxed requirements further from the judicial model.

Balancing these factors, I disagree with the holding of the Federal Court of Appeal in *Shah*, *supra*, at p. 239, that the duty of fairness owed in these circumstances is simply "minimal". Rather, the circumstances require a full and fair consideration of the issues, and the claimant and others whose important interests are affected by the decision in a fundamental way must have a meaningful opportunity to present the various types of evidence relevant to their case and have it fully and fairly considered.

However, it also cannot be said that an oral hearing is always necessary to ensure a fair hearing and consideration of the issues involved. The flexible nature of the duty of fairness recognizes that meaningful participation can occur in different ways in different situations. The Federal Court has held that procedural fairness does not require an oral hearing in these circumstances: see, for example, *Said*, *supra*, at p. 30.

I agree that an oral hearing is not a general requirement for H & C decisions. An interview is not essential for the information relevant to an H & C application to be put before an immigration officer, so that the humanitarian and compassionate considerations presented may be considered in their entirety and in a fair manner. In this case, the appellant had the opportunity to put forward, in written form through her lawyer, information about her situation, her children and their emotional dependence on her, and documentation in support of her application from a social worker at the Children's Aid Society and from her psychiatrist. These documents were before the decision-makers, and they contained the information relevant to making this decision. Taking all the factors relevant to determining the content of the duty of fairness into account, the lack of an oral hearing or

importants, bien que ce ne soient évidemment pas des facteurs déterminants dans l'analyse. On peut donc voir que, si certains facteurs indiquent des exigences plus strictes en matière d'obligation d'équité, d'autres indiquent des exigences moins strictes, plus éloignées du modèle judiciaire.

32 Pondérant ces facteurs, je ne suis pas d'accord avec la conclusion de la Cour d'appel fédérale dans l'arrêt *Shah*, précité, à la p. 239, que l'obligation d'équité dans ces circonstances est simplement «minimale». Au contraire, les circonstances nécessitent un examen complet et équitable des questions litigieuses, et le demandeur et les personnes dont les intérêts sont profondément touchés par la décision doivent avoir une possibilité valable de présenter les divers types de preuves qui se rapportent à leur affaire et de les voir évalués de façon complète et équitable.

33 Toutefois, on ne peut pas dire non plus qu'une audience est toujours nécessaire pour garantir l'audition et l'examen équitables des questions en jeu. La nature souple de l'obligation d'équité reconnaît qu'une participation valable peut se faire de différentes façons dans des situations différentes. La Cour fédérale a statué que l'équité procédurale n'exige pas la tenue d'une audience dans ces circonstances: voir, par exemple, *Said*, précité, à la p. 30.

34 Je conviens que la tenue d'une audience n'est pas une exigence générale pour les décisions fondées sur des raisons d'ordre humanitaire. Il n'est pas indispensable qu'il y ait une entrevue pour exposer à un agent d'immigration les renseignements relatifs à une demande fondée sur des raisons d'ordre humanitaire et pour que les raisons d'ordre humanitaire présentées puissent être évaluées de façon complète et équitable. En l'espèce, l'appelante a eu la possibilité d'exposer par écrit, par l'entremise de son avocat, sa situation, celle de ses enfants et leur dépendance émotive vis-à-vis d'elle, et de présenter à l'appui de sa demande des lettres d'un travailleur social de la Société d'aide à l'enfance et de son psychiatre. Ces documents étaient à la disposition des décideurs, et ils contenaient les renseignements nécessaires pour la prise de décision. Compte tenu de tous les facteurs

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notice of such a hearing did not, in my opinion, constitute a violation of the requirements of procedural fairness to which Ms. Baker was entitled in the circumstances, particularly given the fact that several of the factors point toward a more relaxed standard. The opportunity, which was accorded, for the appellant or her children to produce full and complete written documentation in relation to all aspects of her application satisfied the requirements of the participatory rights required by the duty of fairness in this case.

(4) The Provision of Reasons

35 The appellant also submits that the duty of fairness, in these circumstances, requires that reasons be given by the decision-maker. She argues either that the notes of Officer Lorenz should be considered the reasons for the decision, or that it should be held that the failure of Officer Caden to give written reasons for his decision or a subsequent affidavit explaining them should be taken to be a breach of the principles of fairness.

36 This issue has been addressed in several cases of judicial review of humanitarian and compassionate applications. The Federal Court of Appeal has held that reasons are unnecessary: *Shah*, *supra*, at pp. 239-40. It has also been held that the case history notes prepared by a subordinate officer are not to be considered the decision-maker's reasons: see *Tylo v. Minister of Employment and Immigration* (1995), 90 F.T.R. 157, at pp. 159-60. In *Gheorlan v. Canada (Secretary of State)* (1995), 26 Imm. L.R. (2d) 170 (F.C.T.D.), and *Chan v. Canada (Minister of Citizenship and Immigration)* (1994), 87 F.T.R. 62, it was held that the notes of the reviewing officer should not be taken to be the reasons for decision, but may help in determining whether a reviewable error exists. In *Marques v. Canada (Minister of Citizenship and Immigration) (No. 1)* (1995), 116 F.T.R. 241, an H & C decision was set aside because the decision-making officer

pertinents pour évaluer le contenu de l'obligation d'équité, le fait qu'il n'y a pas eu d'audience ni d'avis d'audience ne constituait pas, selon moi, un manquement à l'obligation d'équité procédurale envers M^me^ Baker dans les circonstances, particulièrement en raison du fait que plusieurs des facteurs militaient en faveur d'une norme plus souple. La possibilité qui a été offerte à l'appelante et à ses enfants de produire une documentation écrite complète relativement à tous les aspects de sa demande remplit les exigences en matière de droits de participation que commandait l'obligation d'équité en l'espèce.

(4) L'exposé des motifs

L'appelante soutient également que l'obligation d'équité, dans les circonstances, exige que le décideur motive ses décisions. Elle soutient qu'il faut soit considérer les notes de l'agent Lorenz comme les motifs de la décision, soit conclure que le défaut de l'agent Caden de donner les motifs écrits de sa décision, ou un affidavit subséquent les expliquant, est un manquement aux principes d'équité.

Cette question a été abordée dans plusieurs cas de contrôle judiciaire de demandes fondées sur des raisons d'ordre humanitaire. La Cour d'appel fédérale a statué qu'il n'était pas nécessaire que les décisions soient motivées: *Shah*, précité, aux pp. 239 et 240. Elle a également statué que les notes de l'historique des faits préparées par un agent subalterne ne doivent pas être considérées comme les motifs du décideur: voir *Tylo c. Ministre de l'Emploi et de l'Immigration* (1995), 90 F.T.R. 157, aux pp. 159 et 160. Les décisions *Gheorlan c. Canada (Secrétaire d'État)* (1995), 26 Imm. L.R. (2d) 170 (C.F. 1^re^ inst.), et *Chan c. Canada (Ministre de la Citoyenneté et de l'Immigration)* (1994), 87 F.T.R. 62, concluent qu'il ne faut pas considérer les notes de l'agent de réexamen comme des motifs de décision, mais que ces notes peuvent servir à déterminer s'il existe une erreur susceptible de contrôle judiciaire. Dans *Marques c. Canada (Ministre de la Citoyenneté et de l'Immigration) (n^o^ 1)* (1995), 116 F.T.R. 241, une décision d'ordre humanitaire a été annulée parce que le décideur n'avait pas motivé sa

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failed to provide reasons or an affidavit explaining the reasons for his decision.

More generally, the traditional position at common law has been that the duty of fairness does not require, as a general rule, that reasons be provided for administrative decisions: *Northwestern Utilities Ltd. v. City of Edmonton*, [1979] 1 S.C.R. 684; *Supermarchés Jean Labrecque Inc. v. Flamand*, [1987] 2 S.C.R. 219, at p. 233; *Public Service Board of New South Wales v. Osmond* (1986), 159 C.L.R. 656 (H.C.A.), at pp. 665-66.

Courts and commentators have, however, often emphasized the usefulness of reasons in ensuring fair and transparent decision-making. Though *Northwestern Utilities* dealt with a statutory obligation to give reasons, Estey J. held as follows, at p. 706, referring to the desirability of a common law reasons requirement:

> This obligation is a salutary one. It reduces to a considerable degree the chances of arbitrary or capricious decisions, reinforces public confidence in the judgment and fairness of administrative tribunals, and affords parties to administrative proceedings an opportunity to assess the question of appeal. . . .

The importance of reasons was recently reemphasized by this Court in *Reference re Remuneration of Judges of the Provincial Court of Prince Edward Island*, [1997] 3 S.C.R. 3, at paras. 180-81.

Reasons, it has been argued, foster better decision making by ensuring that issues and reasoning are well articulated and, therefore, more carefully thought out. The process of writing reasons for decision by itself may be a guarantee of a better decision. Reasons also allow parties to see that the applicable issues have been carefully considered, and are invaluable if a decision is to be appealed, questioned, or considered on judicial review: R. A. Macdonald and D. Lametti, "Reasons for Decision in Administrative Law" (1990), 3 *C.J.A.L.P.* 123, at p. 146; *Williams v. Canada (Minister of Citizenship and Immigration)*, [1997] 2 F.C. 646 (C.A.), at para. 38. Those affected may

décision, ni fourni d'affidavit expliquant les motifs de sa décision.

37 Plus généralement, la common law a traditionnellement reconnu que l'obligation d'équité n'exige pas, en règle générale, que les décisions administratives soient motivées: *Northwestern Utilities Ltd. c. Ville d'Edmonton*, [1979] 1 R.C.S. 684; *Supermarchés Jean Labrecque Inc. c. Flamand*, [1987] 2 R.C.S. 219, à la p. 233; *Public Service Board of New South Wales c. Osmond* (1986), 159 C.L.R. 656 (H.C.A.), aux pp. 665 et 666.

38 Toutefois, les tribunaux et les auteurs ont maintes fois souligné l'utilité des motifs pour assurer la transparence et l'équité de la prise de décision. Quoique l'arrêt *Northwestern Utilities* traite d'une obligation légale de motiver des décisions, le juge Estey fait l'observation suivante, à la p. 706, sur l'utilité d'une règle de common law qui exigerait la production de motifs:

> Cette obligation est salutaire: elle réduit considérablement les risques de décisions arbitraires, raffermit la confiance du public dans le jugement et l'équité des tribunaux administratifs et permet aux parties aux procédures d'évaluer la possibilité d'un appel . . .

L'importance des motifs a récemment été réitérée par la Cour dans le *Renvoi relatif à la rémunération des juges de la Cour provinciale de l'Île-du-Prince-Édouard*, [1997] 3 R.C.S. 3, aux par. 180 et 181.

39 On a soutenu que la rédaction de motifs favorise une meilleure prise de décision en ce qu'elle exige une bonne formulation des questions et du raisonnement et, en conséquence, une analyse plus rigoureuse. Le processus de rédaction des motifs d'une décision peut en lui-même garantir une meilleure décision. Les motifs permettent aussi aux parties de voir que les considérations applicables ont été soigneusement étudiées, et ils sont de valeur inestimable si la décision est portée en appel, contestée ou soumise au contrôle judiciaire: R. A. Macdonald et D. Lametti, «Reasons for Decision in Administrative Law» (1990), 3 *C.J.A.L.P.* 123, à la p. 146; *Williams c. Canada*

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be more likely to feel they were treated fairly and appropriately if reasons are given: de Smith, Woolf, & Jowell, *Judicial Review of Administrative Action* (5th ed. 1995), at pp. 459-60. I agree that these are significant benefits of written reasons.

40 Others have expressed concerns about the desirability of a written reasons requirement at common law. In *Osmond*, *supra*, Gibbs C.J. articulated, at p. 668, the concern that a reasons requirement may lead to an inappropriate burden being imposed on administrative decision-makers, that it may lead to increased cost and delay, and that it "might in some cases induce a lack of candour on the part of the administrative officers concerned". Macdonald and Lametti, *supra*, though they agree that fairness should require the provision of reasons in certain circumstances, caution against a requirement of "archival" reasons associated with court judgments, and note that the special nature of agency decision-making in different contexts should be considered in evaluating reasons requirements. In my view, however, these concerns can be accommodated by ensuring that any reasons requirement under the duty of fairness leaves sufficient flexibility to decision-makers by accepting various types of written explanations for the decision as sufficient.

41 In England, a common law right to reasons in certain circumstances has developed in the case law: see M. H. Morris, "Administrative Decision-makers and the Duty to Give Reasons: An Emerging Debate" (1997), 11 *C.J.A.L.P.* 155, at pp. 164-68; de Smith, Woolf & Jowell, *supra*, at pp. 462-65. In *R. v. Civil Service Appeal Board, ex parte Cunningham*, [1991] 4 All E.R. 310 (C.A.), reasons were required of a board deciding the appeal of the dismissal of a prison official. The House of Lords, in *R. v. Secretary of State for the Home Department, ex parte Doody*, [1994] 1 A.C. 531, imposed a reasons requirement on the Home

(Ministre de la Citoyenneté et de l'Immigration), [1997] 2 C.F. 646 (C.A.), au par. 38. Il est plus probable que les personnes touchées ont l'impression d'être traitées avec équité et de façon appropriée si des motifs sont fournis: de Smith, Woolf & Jowell, *Judicial Review of Administrative Action* (5e éd. 1995), aux pp. 459 et 460. Je suis d'accord qu'il s'agit là d'avantages importants de la rédaction de motifs écrits.

D'autres ont émis des réserves quant à l'utilité d'une règle de common law qui exigerait la production de motifs écrits. Dans l'arrêt *Osmond*, précité, le juge en chef Gibbs a dit, à la p. 668, qu'il craignait qu'une obligation de rédiger des motifs puisse finir par imposer un fardeau indu aux décideurs administratifs, entraîner une augmentation des coûts et des délais, et [TRADUCTION] «dans certains cas occasionner un manque de sincérité de la part des fonctionnaires concernés». Même s'ils conviennent que l'équité devrait exiger que des motifs soient donnés dans certaines circonstances, Macdonald et Lametti, *loc. cit.*, font une mise en garde contre une exigence donnant lieu à des motifs [TRADUCTION] «d'archives» s'apparentant aux décisions judiciaires, et notent qu'il faut tenir compte de la nature particulière de l'organisme décisionnel dans différents contextes pour évaluer l'exigence des motifs. À mon avis, cependant, on peut répondre à ces préoccupations en veillant à ce que toute obligation de motiver la décision en raison de l'obligation d'équité laisse aux décideurs assez de latitude, en acceptant comme suffisants divers types d'explications écrites.

En Angleterre, un droit de common law à la production de motifs dans certaines circonstances est apparu dans la jurisprudence: voir M. H. Morris, «Administrative Decision-makers and the Duty to Give Reasons: An Emerging Debate» (1997), 11 *C.J.A.L.P.* 155, aux pp. 164 à 168; de Smith, Woolf & Jowell, *op. cit.*, aux pp. 462 à 465. L'arrêt *R. c. Civil Service Appeal Board, ex parte Cunningham*, [1991] 4 All E.R. 310 (C.A.), a conclu qu'une commission décidant de l'appel du congédiement d'un agent de prison devait motiver sa décision. La Chambre des lords, dans l'arrêt *R. c. Secretary of State for the Home Department, ex*

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Secretary when exercising the statutory discretion to decide on the period of imprisonment that a prisoner who had been imposed a life sentence should serve before being entitled to a review. Lord Mustill, speaking for all the law lords on the case, held that although there was no general duty to give reasons at common law, in those circumstances, a failure to give reasons was unfair. Other English cases have held that reasons are required at common law when there is a statutory right of appeal: see *Norton Tool Co. v. Tewson*, [1973] 1 W.L.R. 45 (N.I.R.C.), at p. 49; *Alexander Machinery (Dudley) Ltd. v. Crabtree*, [1974] I.C.R. 120 (N.I.R.C.).

parte Doody, [1994] 1 A.C. 531, a exigé que le Secrétaire de l'Intérieur fournisse des motifs quand il exerce le pouvoir discrétionnaire dont l'investit la loi de décider du temps qu'une personne condamnée à l'emprisonnement à perpétuité devait passer en prison avant d'avoir droit à un réexamen. Lord Mustill, au nom de tous les lords juristes dans l'affaire, conclut que même s'il n'existe pas d'obligation générale de fournir des motifs en common law, dans les circonstances visées, il était inéquitable de ne pas fournir des motifs. D'autres décisions anglaises ont conclu que la common law exige que les décisions soient motivées quand il existe un droit d'appel prévu par la loi: voir *Norton Tool Co. c. Tewson*, [1973] 1 W.L.R. 45 (N.I.R.C.), à la p. 49; *Alexander Machinery (Dudley) Ltd. c. Crabtree*, [1974] I.C.R. 120 (N.I.R.C.).

Some Canadian courts have imposed, in certain circumstances, a common law obligation on administrative decision-makers to provide reasons, while others have been more reluctant. In *Orlowski v. British Columbia (Attorney-General)* (1992), 94 D.L.R. (4th) 541 (B.C.C.A.), at pp. 551-52, it was held that reasons would generally be required for decisions of a review board under Part XX.1 of the *Criminal Code*, based in part on the existence of a statutory right of appeal from that decision, and also on the importance of the interests affected by the decision. In *R.D.R. Construction Ltd. v. Rent Review Commission* (1982), 55 N.S.R. (2d) 71 (C.A.), the court also held that because of the existence of a statutory right of appeal, there was an implied duty to give reasons. Smith D.J., in *Taabea v. Refugee Status Advisory Committee*, [1980] 2 F.C. 316 (T.D.), imposed a reasons requirement on a ministerial decision relating to refugee status, based upon the right to apply to the Immigration Appeal Board for redetermination. Similarly, in the context of evaluating whether a statutory reasons requirement had been adequately fulfilled in *Boyle v. Workplace Health, Safety and Compensation Commission (N.B.)* (1996), 179 N.B.R. (2d) 43 (C.A.), Bastarache J.A. (as he then was) emphasized, at p. 55, the importance of adequate reasons when appealing a decision. However, the Federal Court of Appeal recently rejected the submission that reasons were required in rela-

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Certains tribunaux canadiens ont imposé aux décideurs administratifs, dans des circonstances particulières, une obligation de common law de motiver leurs décisions, tandis que d'autres ont été plus hésitants à le faire. L'arrêt *Orlowski c. British Columbia (Attorney-General)* (1992), 94 D.L.R. (4th) 541 (C.A.C.-B.), aux pp. 551 et 552, conclut qu'en général une commission d'examen agissant sous le régime de la partie XX.1 du *Code criminel* devait motiver ses décisions, en raison notamment de l'existence d'un droit d'appel prévu par la loi et de l'importance des droits touchés par ces décisions. Dans l'arrêt *R.D.R. Construction Ltd. c. Rent Review Commission* (1982), 55 N.S.R. (2d) 71 (C.A.), la cour a statué qu'en raison de l'existence d'un droit d'appel prévu par la loi, il existait implicitement une obligation de donner des motifs. Le juge suppléant Smith, dans l'affaire *Taabea c. Comité consultatif sur le statut de réfugié*, [1980] 2 C.F. 316 (1re inst.), a imposé une obligation de motiver une décision ministérielle portant sur le statut de réfugié, en raison du droit d'en demander le réexamen devant la Commission d'appel de l'immigration. De même, alors qu'il examinait si l'exigence prévue par la loi de donner des motifs avait été convenablement remplie, le juge Bastarache (alors juge à la Cour d'appel) a souligné, dans l'arrêt *Boyle c. Commission de la santé, de la sécurité et de l'indemnisation des accidents au travail (N.-B.)* (1996), 179 R.N.-B. (2e) 43

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tion to a decision to declare a permanent resident a danger to the public under s. 70(5) of the *Immigration Act*: *Williams*, *supra*.

(C.A.), à la p. 55, qu'il était important de disposer de motifs appropriés quand une décision est portée en appel. Toutefois, la Cour d'appel fédérale a récemment conclu qu'il n'était pas nécessaire de motiver une décision dont le but était de déclarer qu'un résident permanent constituait un danger pour le public en vertu du par. 70(5) de la *Loi sur l'immigration*: *Williams*, précité.

43 In my opinion, it is now appropriate to recognize that, in certain circumstances, the duty of procedural fairness will require the provision of a written explanation for a decision. The strong arguments demonstrating the advantages of written reasons suggest that, in cases such as this where the decision has important significance for the individual, when there is a statutory right of appeal, or in other circumstances, some form of reasons should be required. This requirement has been developing in the common law elsewhere. The circumstances of the case at bar, in my opinion, constitute one of the situations where reasons are necessary. The profound importance of an H & C decision to those affected, as with those at issue in *Orlowski*, *Cunningham*, and *Doody*, militates in favour of a requirement that reasons be provided. It would be unfair for a person subject to a decision such as this one which is so critical to their future not to be told why the result was reached.

À mon avis, il est maintenant approprié de reconnaître que, dans certaines circonstances, l'obligation d'équité procédurale requerra une explication écrite de la décision. Les solides arguments démontrant les avantages de motifs écrits indiquent que, dans des cas comme en l'espèce où la décision revêt une grande importance pour l'individu, dans des cas où il existe un droit d'appel prévu par la loi, ou dans d'autres circonstances, une forme quelconque de motifs écrits est requise. Cette exigence est apparue dans la common law ailleurs. Les circonstances de l'espèce, à mon avis, constituent l'une de ces situations où des motifs écrits sont nécessaires. L'importance cruciale d'une décision d'ordre humanitaire pour les personnes visées, comme celles dont il est question dans les arrêts *Orlowski*, *Cunningham* et *Doody*, milite en faveur de l'obligation de donner des motifs. Il serait injuste à l'égard d'une personne visée par une telle décision, si essentielle pour son avenir, de ne pas lui expliquer pourquoi elle a été prise.

44 In my view, however, the reasons requirement was fulfilled in this case since the appellant was provided with the notes of Officer Lorenz. The notes were given to Ms. Baker when her counsel asked for reasons. Because of this, and because there is no other record of the reasons for making the decision, the notes of the subordinate reviewing officer should be taken, by inference, to be the reasons for decision. Accepting documents such as these notes as sufficient reasons is part of the flexibility that is necessary, as emphasized by Macdonald and Lametti, *supra*, when courts evaluate the requirements of the duty of fairness with recognition of the day-to-day realities of administrative agencies and the many ways in which the values underlying the principles of procedural fairness

J'estime, toutefois, que cette obligation a été remplie en l'espèce par la production des notes de l'agent Lorenz à l'appelante. Les notes ont été remises à M^me^ Baker lorsque son avocat a demandé des motifs. Pour cette raison, et parce qu'il n'existe pas d'autres documents indiquant les motifs de la décision, les notes de l'agent subalterne devraient être considérées, par déduction, comme les motifs de la décision. L'admission de documents tels que ces notes comme motifs de la décision fait partie de la souplesse nécessaire, ainsi que l'ont souligné Macdonald et Lametti, *loc. cit.*, quand des tribunaux évaluent les exigences de l'obligation d'équité tout en tenant compte de la réalité quotidienne des organismes administratifs et des nombreuses façons d'assurer le respect des

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can be assured. It upholds the principle that individuals are entitled to fair procedures and open decision-making, but recognizes that in the administrative context, this transparency may take place in various ways. I conclude that the notes of Officer Lorenz satisfy the requirement for reasons under the duty of procedural fairness in this case, and they will be taken to be the reasons for decision.

(5) Reasonable Apprehension of Bias

Procedural fairness also requires that decisions be made free from a reasonable apprehension of bias by an impartial decision-maker. The respondent argues that Simpson J. was correct to find that the notes of Officer Lorenz cannot be considered to give rise to a reasonable apprehension of bias because it was Officer Caden who was the actual decision-maker, who was simply reviewing the recommendation prepared by his subordinate. In my opinion, the duty to act fairly and therefore in a manner that does not give rise to a reasonable apprehension of bias applies to all immigration officers who play a significant role in the making of decisions, whether they are subordinate reviewing officers, or those who make the final decision. The subordinate officer plays an important part in the process, and if a person with such a central role does not act impartially, the decision itself cannot be said to have been made in an impartial manner. In addition, as discussed in the previous section, the notes of Officer Lorenz constitute the reasons for the decision, and if they give rise to a reasonable apprehension of bias, this taints the decision itself.

The test for reasonable apprehension of bias was set out by de Grandpré J., writing in dissent, in *Committee for Justice and Liberty v. National Energy Board*, [1978] 1 S.C.R. 369, at p. 394:

> . . . the apprehension of bias must be a reasonable one, held by reasonable and right minded persons, applying themselves to the question and obtaining thereon the required information. . . [T]hat test is "what would an

valeurs qui fondent les principes de l'équité procédurale. Cela confirme le principe selon lequel les individus ont droit à une procédure équitable et à la transparence de la prise de décision, mais reconnaît aussi qu'en matière administrative, cette transparence peut être atteinte de différentes façons. Je conclus qu'en l'espèce les notes de l'agent Lorenz remplissent l'obligation de donner des motifs en vertu de l'obligation d'équité procédurale, et qu'elles seront considérées comme les motifs de la décision.

(5) La crainte raisonnable de partialité

45 L'équité procédurale exige également que les décisions soient rendues par un décideur impartial, sans crainte raisonnable de partialité. L'intimé soutient que le juge Simpson a eu raison de conclure que les notes de l'agent Lorenz ne peuvent pas donner lieu à une crainte raisonnable de partialité, parce que le vrai décideur était l'agent Caden, qui a simplement fait une revue de la recommandation préparée par son subalterne. L'obligation d'agir équitablement et, en conséquence, d'une façon qui ne donne pas lieu à une crainte raisonnable de partialité, s'applique, à mon avis, à tous les agents d'immigration qui jouent un rôle significatif dans la prise de décision, qu'ils soient des agents de réexamen subalternes, ou ceux qui rendent la décision finale. L'agent subordonné joue un rôle important dans le processus, et si une personne ayant un rôle aussi central n'agit pas de façon impartiale, la décision elle-même ne peut pas être considérée comme ayant été rendue de façon impartiale. En outre, comme je le dis au paragraphe précédent, les notes de l'agent Lorenz constituent les motifs de la décision, et si elles donnent lieu à une crainte raisonnable de partialité, la décision elle-même en est viciée.

46 Le test de la crainte raisonnable de partialité a été exposé par le juge de Grandpré, dissident, dans l'arrêt *Committee for Justice and Liberty c. Office national de l'énergie*, [1978] 1 R.C.S. 369, à la p. 394:

> . . . la crainte de partialité doit être raisonnable et le fait d'une personne sensée et raisonnable qui se poserait elle-même la question et prendrait les renseignements nécessaires à ce sujet. [. . .] [C]e critère consiste à se

informed person, viewing the matter realistically and practically — and having thought the matter through — conclude. Would he think that it is more likely than not that [the decision-maker], whether consciously or unconsciously, would not decide fairly."

This expression of the test has often been endorsed by this Court, most recently in *R. v. S. (R.D.)*, [1997] 3 S.C.R. 484, at para. 11, *per* Major J.; at para. 31, *per* L'Heureux-Dubé and McLachlin JJ.; and at para. 111, *per* Cory J.

47 It has been held that the standards for reasonable apprehension of bias may vary, like other aspects of procedural fairness, depending on the context and the type of function performed by the administrative decision-maker involved: *Newfoundland Telephone Co. v. Newfoundland (Board of Commissioners of Public Utilities)*, [1992] 1 S.C.R. 623; *Old St. Boniface*, *supra*, at p. 1192. The context here is one where immigration officers must regularly make decisions that have great importance to the individuals affected by them, but are also often critical to the interests of Canada as a country. They are individualized, rather than decisions of a general nature. They also require special sensitivity. Canada is a nation made up largely of people whose families migrated here in recent centuries. Our history is one that shows the importance of immigration, and our society shows the benefits of having a diversity of people whose origins are in a multitude of places around the world. Because they necessarily relate to people of diverse backgrounds, from different cultures, races, and continents, immigration decisions demand sensitivity and understanding by those making them. They require a recognition of diversity, an understanding of others, and an openness to difference.

48 In my opinion, the well-informed member of the community would perceive bias when reading Officer Lorenz's comments. His notes, and the manner in which they are written, do not disclose the existence of an open mind or a weighing of the particular circumstances of the case free from stereotypes. Most unfortunate is the fact that they

demander «à quelle conclusion en arriverait une personne bien renseignée qui étudierait la question en profondeur, de façon réaliste et pratique. Croirait-elle que, selon toute vraisemblance, [le décideur], consciemment ou non, ne rendra pas une décision juste?»

Notre Cour a souvent souscrit à cette définition du test, plus récemment dans l'arrêt *R. c. S. (R.D.)*, [1997] 3 R.C.S. 484, au par. 11, le juge Major; au par. 31, les juges L'Heureux-Dubé et McLachlin; et au par. 111, le juge Cory.

Il a été décidé que le test relatif à la crainte raisonnable de partialité pouvait varier, comme d'autres éléments de l'équité procédurale, selon le contexte et le genre de fonction exercée par le décideur administratif concerné: *Newfoundland Telephone Co. c. Terre-Neuve (Board of Commissioners of Public Utilities)*, [1992] 1 R.C.S. 623; *Vieux St-Boniface*, précité, à la p. 1192. Le contexte en l'espèce est que les agents d'immigration doivent régulièrement prendre des décisions qui ont une très grande importance pour les personnes visées, mais qui souvent ont aussi une incidence sur les intérêts du Canada comme pays. Ce sont des décisions de nature individuelle plutôt que générale. Elles exigent également une grande sensibilité. Le Canada est une nation en grande partie composée de gens dont les familles ont émigré dans les siècles derniers. Notre histoire démontre l'importance de l'immigration, et notre société est l'exemple des avantages de la diversité de gens originaires d'une multitude de pays. Parce qu'elles visent nécessairement des personnes de provenances diverses, issues de cultures, de races et de continents différents, les décisions en matière d'immigration exigent de ceux qui les rendent sensibilité et compréhension. Elles exigent qu'on reconnaisse la diversité ainsi qu'une compréhension des autres et une ouverture d'esprit à la différence.

À mon avis, les membres bien informés de la communauté percevraient la partialité dans les commentaires de l'agent Lorenz. Ses notes, et la façon dont elles sont rédigées, ne témoignent ni d'un esprit ouvert ni d'une absence de stéréotypes dans l'évaluation des circonstances particulières de l'affaire. Plus regrettable encore est le fait qu'elles

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seem to make a link between Ms. Baker's mental illness, her training as a domestic worker, the fact that she has several children, and the conclusion that she would therefore be a strain on our social welfare system for the rest of her life. In addition, the conclusion drawn was contrary to the psychiatrist's letter, which stated that, with treatment, Ms. Baker could remain well and return to being a productive member of society. Whether they were intended in this manner or not, these statements give the impression that Officer Lorenz may have been drawing conclusions based not on the evidence before him, but on the fact that Ms. Baker was a single mother with several children, and had been diagnosed with a psychiatric illness. His use of capitals to highlight the number of Ms. Baker's children may also suggest to a reader that this was a reason to deny her status. Reading his comments, I do not believe that a reasonable and well-informed member of the community would conclude that he had approached this case with the impartiality appropriate to a decision made by an immigration officer. It would appear to a reasonable observer that his own frustration with the "system" interfered with his duty to consider impartially whether the appellant's admission should be facilitated owing to humanitarian or compassionate considerations. I conclude that the notes of Officer Lorenz demonstrate a reasonable apprehension of bias.

semblent établir un lien entre les troubles mentaux de M^me^ Baker, sa formation comme domestique, le fait qu'elle ait plusieurs enfants, et la conclusion qu'elle serait, en conséquence, un fardeau pour notre système d'aide sociale pour le restant de sa vie. En outre, la conclusion tirée était contraire à la lettre du psychiatre, qui disait qu'avec un traitement, l'état de M^me^ Baker pouvait continuer de s'améliorer et qu'elle pouvait redevenir un membre productif de la société. Qu'elles aient été faites dans cette intention ou non, ces déclarations donnent l'impression que l'agent Lorenz peut avoir tiré des conclusions en se fondant non pas sur la preuve dont il disposait, mais sur le fait que M^me^ Baker était une mère célibataire ayant plusieurs enfants, et était atteinte de troubles psychiatriques. L'utilisation de majuscules par l'agent pour souligner le nombre des enfants de M^me^ Baker peut également indiquer au lecteur que c'était là une raison de lui refuser sa demande. À la lecture des commentaires de l'agent, je ne crois pas qu'un membre raisonnable et bien informé de la communauté conclurait que l'agent a traité cette affaire avec l'impartialité requise de la part d'un agent d'immigration rendant ce genre de décision. Un observateur raisonnable noterait que la propre frustration de l'agent face au «système» l'empêchait d'évaluer avec impartialité si l'admission de l'appelante devrait être facilitée pour des raisons d'ordre humanitaire. Je conclus que les notes de l'agent Lorenz donnent lieu à une crainte raisonnable de partialité.

D. *Review of the Exercise of the Minister's Discretion*

Although the finding of reasonable apprehension of bias is sufficient to dispose of this appeal, it does not address the issues contained in the "serious question of general importance" which was certified by Simpson J. relating to the approach to be taken to children's interests when reviewing the exercise of the discretion conferred by the Act and the Regulations. Since it is important to address the central questions which led to this appeal, I will also consider whether, as a substantive matter, the H & C decision was improperly made in this case.

D. *Le contrôle de l'exercice du pouvoir discrétionnaire du ministre*

49 Bien que l'existence d'une crainte raisonnable de partialité suffise pour trancher le présent pourvoi, cette conclusion ne règle pas les points litigieux énoncés dans la «question grave de portée générale», certifiée par le juge Simpson, concernant la façon d'aborder l'intérêt des enfants dans le contrôle de l'exercice du pouvoir discrétionnaire conféré par la Loi et le règlement. Comme il est important de traiter des questions centrales qui ont conduit au présent pourvoi, j'examinerai également si, sur le fond, la décision d'ordre humanitaire a été incorrectement rendue dans la présente affaire.

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50 The appellant argues that the notes provided to her show that, as a matter of law, the decision should be overturned on judicial review. She submits that the decision should be held to a standard of review of correctness, that principles of administrative law require this discretion to be exercised in accordance with the Convention, and that the Minister should apply the best interests of the child as a primary consideration in H & C decisions. The respondent submits that the Convention has not been implemented in Canadian law, and that to require that s. 114(2) and the Regulations made under it be interpreted in accordance with the Convention would be improper, since it would interfere with the broad discretion granted by Parliament, and with the division of powers between the federal and provincial governments.

L'appelante allègue que les notes qu'on lui a remises montrent que, en droit, la décision devrait être annulée par voie de contrôle judiciaire. Elle soutient que la décision devrait respecter la norme de la décision correcte, que les principes de droit administratif exigent que ce pouvoir discrétionnaire soit exercé conformément à la Convention, et que le ministre devrait faire de l'intérêt supérieur de l'enfant une considération primordiale dans les décisions d'ordre humanitaire. L'intimé soutient que la Convention n'a pas été incorporée dans le droit canadien, et qu'il serait inapproprié d'exiger que le par. 114(2) et son règlement d'application soient interprétés conformément à la Convention, parce que cela empiéterait sur le pouvoir discrétionnaire étendu conféré par le Parlement, et sur le partage des pouvoirs entre les gouvernements fédéral et provinciaux.

(1) The Approach to Review of Discretionary Decision-Making

(1) La démarche relative au contrôle de décisions discrétionnaires

51 As stated earlier, the legislation and Regulations delegate considerable discretion to the Minister in deciding whether an exemption should be granted based upon humanitarian and compassionate considerations. The Regulations state that "[t]he Minister is . . . authorized to" grant an exemption or otherwise facilitate the admission to Canada of any person "where the Minister is satisfied that" this should be done "owing to the existence of compassionate or humanitarian considerations". This language signals an intention to leave considerable choice to the Minister on the question of whether to grant an H & C application.

Comme je l'ai dit précédemment, la loi et le règlement délèguent un très large pouvoir discrétionnaire au ministre dans la décision d'accorder une dispense pour des raisons d'ordre humanitaire. Le règlement dit que «[l]e ministre est autorisé à accorder, pour des raisons d'ordre humanitaire, une dispense [. . .] ou à faciliter l'admission au Canada de toute autre manière». Ce langage témoigne de l'intention de laisser au ministre une grande latitude dans sa décision d'accorder ou non une demande fondée sur des raisons d'ordre humanitaire.

52 The concept of discretion refers to decisions where the law does not dictate a specific outcome, or where the decision-maker is given a choice of options within a statutorily imposed set of boundaries. As K. C. Davis wrote in *Discretionary Justice* (1969), at p. 4:

> A public officer has discretion whenever the effective limits on his power leave him free to make a choice among possible courses of action or inaction.

La notion de pouvoir discrétionnaire s'applique dans les cas où le droit ne dicte pas une décision précise, ou quand le décideur se trouve devant un choix d'options à l'intérieur de limites imposées par la loi. K. C. Davis écrit ceci dans *Discretionary Justice* (1969), à la p. 4:

> [TRADUCTION] Un fonctionnaire possède un pouvoir discrétionnaire quand les limites réelles de son pouvoir lui donnent la liberté de choisir entre divers modes d'action ou d'inaction possibles.

It is necessary in this case to consider the approach to judicial review of administrative discretion,

Il faut examiner en l'espèce l'approche du contrôle judiciaire en matière de pouvoir discrétionnaire

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taking into account the "pragmatic and functional" approach to judicial review that was first articulated in *U.E.S., Local 298 v. Bibeault*, [1988] 2 S.C.R. 1048, and has been applied in subsequent cases including *Canada (Attorney General) v. Mossop*, [1993] 1 S.C.R. 554, at pp. 601-7, *per* L'Heureux-Dubé J., dissenting, but not on this issue; *Pezim v. British Columbia (Superintendent of Brokers)*, [1994] 2 S.C.R. 557; *Canada (Director of Investigation and Research) v. Southam Inc.*, [1997] 1 S.C.R. 748; and *Pushpanathan*, *supra*.

Administrative law has traditionally approached the review of decisions classified as discretionary separately from those seen as involving the interpretation of rules of law. The rule has been that decisions classified as discretionary may only be reviewed on limited grounds such as the bad faith of decision-makers, the exercise of discretion for an improper purpose, and the use of irrelevant considerations: see, for example, *Maple Lodge Farms Ltd. v. Government of Canada*, [1982] 2 S.C.R. 2, at pp. 7-8; *Shell Canada Products Ltd. v. Vancouver (City)*, [1994] 1 S.C.R. 231. A general doctrine of "unreasonableness" has also sometimes been applied to discretionary decisions: *Associated Provincial Picture Houses, Ltd. v. Wednesbury Corporation*, [1948] 1 K.B. 223 (C.A.). In my opinion, these doctrines incorporate two central ideas — that discretionary decisions, like all other administrative decisions, must be made within the bounds of the jurisdiction conferred by the statute, but that considerable deference will be given to decision-makers by courts in reviewing the exercise of that discretion and determining the scope of the decision-maker's jurisdiction. These doctrines recognize that it is the intention of a legislature, when using statutory language that confers broad choices on administrative agencies, that courts should not lightly interfere with such decisions, and should give considerable respect to decision-makers when reviewing the manner in which discretion was exercised. However, discretion must still be exercised in a manner that is within a reasonable interpretation of the margin of manoeuvre contemplated by the legislature, in accordance with the principles of the rule of law (*Roncarelli v.*

administratif, en tenant compte de l'analyse «pragmatique et fonctionnelle» du contrôle judiciaire qui a été énoncée pour la première fois dans l'arrêt *U.E.S., Local 298 c. Bibeault*, [1988] 2 R.C.S. 1048, et appliquée dans des arrêts postérieurs dont *Canada (Procureur général) c. Mossop*, [1993] 1 R.C.S. 554, aux pp. 601 à 607, le juge L'Heureux-Dubé, dissidente sur d'autres points; *Pezim c. Colombie-Britannique (Superintendent of Brokers)*, [1994] 2 R.C.S. 557; *Canada (Directeur des enquêtes et recherches) c. Southam Inc.*, [1997] 1 R.C.S. 748; et *Pushpanathan*, précité.

53 Le droit administratif a traditionnellement abordé le contrôle judiciaire des décisions discrétionnaires séparément de décisions sur l'interprétation de règles de droit. Le principe est qu'on ne peut exercer un contrôle judiciaire sur les décisions discrétionnaires que pour des motifs limités, comme la mauvaise foi des décideurs, l'exercice du pouvoir discrétionnaire dans un but incorrect, et l'utilisation de considérations non pertinentes: voir, par exemple, *Maple Lodge Farms Ltd. c. Gouvernement du Canada*, [1982] 2 R.C.S. 2, aux pp. 7 et 8; *Produits Shell Canada Ltée c. Vancouver (Ville)*, [1994] 1 R.C.S. 231. Un principe général relatif au «caractère déraisonnable» a parfois été appliqué aussi à des décisions discrétionnaires: *Associated Provincial Picture Houses, Ltd. c. Wednesbury Corporation*, [1948] 1 K.B. 223 (C.A.). À mon avis, ces principes englobent deux idées centrales — qu'une décision discrétionnaire, comme toute autre décision administrative, doit respecter les limites de la compétence conférée par la loi, mais que les tribunaux devront exercer une grande retenue à l'égard des décideurs lorsqu'ils contrôlent ce pouvoir discrétionnaire et déterminent l'étendue de la compétence du décideur. Ces principes reconnaissent que lorsque le législateur confère par voie législative des choix étendus aux organismes administratifs, son intention est d'indiquer que les tribunaux ne devraient pas intervenir à la légère dans de telles décisions, et devraient accorder une marge considérable de respect aux décideurs lorsqu'ils révisent la façon dont les décideurs ont exercé leur discrétion. Toutefois, l'exercice du pouvoir discrétionnaire doit quand même rester dans les limites d'une

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Duplessis, [1959] S.C.R. 121), in line with general principles of administrative law governing the exercise of discretion, and consistent with the *Canadian Charter of Rights and Freedoms* (*Slaight Communications Inc. v. Davidson*, [1989] 1 S.C.R. 1038).

54 It is, however, inaccurate to speak of a rigid dichotomy of "discretionary" or "non-discretionary" decisions. Most administrative decisions involve the exercise of implicit discretion in relation to many aspects of decision making. To give just one example, decision-makers may have considerable discretion as to the remedies they order. In addition, there is no easy distinction to be made between interpretation and the exercise of discretion; interpreting legal rules involves considerable discretion to clarify, fill in legislative gaps, and make choices among various options. As stated by Brown and Evans, *supra*, at p. 14-47:

> The degree of discretion in a grant of power can range from one where the decision-maker is constrained only by the purposes and objects of the legislation, to one where it is so specific that there is almost no discretion involved. In between, of course, there may be any number of limitations placed on the decision-maker's freedom of choice, sometimes referred to as "structured" discretion.

55 The "pragmatic and functional" approach recognizes that standards of review for errors of law are appropriately seen as a spectrum, with certain decisions being entitled to more deference, and others entitled to less: *Pezim*, *supra*, at pp. 589-90; *Southam*, *supra*, at para. 30; *Pushpanathan*, *supra*, at para. 27. Three standards of review have been defined: patent unreasonableness, reasonableness *simpliciter*, and correctness: *Southam*, at paras. 54-56. In my opinion the standard of review of the substantive aspects of discretionary decisions is best approached within this framework, especially given the difficulty in making rigid classifications

interprétation raisonnable de la marge de manœuvre envisagée par le législateur, conformément aux principes de la primauté du droit (*Roncarelli c. Duplessis*, [1959] R.C.S. 121), suivant les principes généraux de droit administratif régissant l'exercice du pouvoir discrétionnaire, et de façon conciliable avec la *Charte canadienne des droits et libertés* (*Slaight Communications Inc. c. Davidson*, [1989] 1 R.C.S. 1038).

J'estime qu'il est inexact de parler d'une dichotomie stricte entre les décisions «discrétionnaires» et les décisions «non discrétionnaires». La plupart des décisions administratives comporte l'exercice d'un pouvoir discrétionnaire implicite relativement à de nombreux aspects de la prise de décision. Pour ne donner qu'un seul exemple, les décideurs peuvent avoir un pouvoir discrétionnaire très étendu dans les réparations qu'ils accordent. En outre, il n'est pas facile d'établir une distinction entre l'interprétation et l'exercice du pouvoir discrétionnaire; l'interprétation de règles de droit comporte un pouvoir discrétionnaire étendu pour ce qui est de clarifier, de combler les vides juridiques, et de choisir entre différentes options. Comme le disent Brown et Evans, *op. cit.*, à la p. 14-47:

> [TRADUCTION] Le degré de discrétion dans l'attribution d'un pouvoir peut aller d'un pouvoir dans lequel le décideur est contraint seulement par les objectifs de la loi, à un pouvoir si défini que n'intervient pratiquement pas de discrétion. Entre les deux, évidemment, il existe plusieurs limites à la liberté de choix du décideur, parfois appelé une discrétion «structurée».

La démarche «pragmatique et fonctionnelle» reconnaît qu'il y a une large gamme de normes de contrôle judiciaire des erreurs de droit, certaines décisions exigeant plus de retenue, et d'autres moins: *Pezim*, précité, aux pp. 589 et 590; *Southam*, précité, au par. 30; *Pushpanathan*, précité, au par. 27. Trois normes de contrôle ont été définies: la décision manifestement déraisonnable, la décision raisonnable *simpliciter* et la décision correcte: *Southam*, précité, aux par. 54 à 56. Je suis d'avis que la norme de contrôle des éléments de fond d'une décision discrétionnaire est mieux envisagée dans ce cadre, compte tenu particulièrement

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between discretionary and non-discretionary decisions. The pragmatic and functional approach takes into account considerations such as the expertise of the tribunal, the nature of the decision being made, and the language of the provision and the surrounding legislation. It includes factors such as whether a decision is "polycentric" and the intention revealed by the statutory language. The amount of choice left by Parliament to the administrative decision-maker and the nature of the decision being made are also important considerations in the analysis. The spectrum of standards of review can incorporate the principle that, in certain cases, the legislature has demonstrated its intention to leave greater choices to decision-makers than in others, but that a court must intervene where such a decision is outside the scope of the power accorded by Parliament. Finally, I would note that this Court has already applied this framework to statutory provisions that confer significant choices on administrative bodies, for example, in reviewing the exercise of the remedial powers conferred by the statute at issue in *Southam*, *supra*.

de la difficulté de faire des classifications rigides entre les décisions discrétionnaires et les décisions non discrétionnaires. La démarche pragmatique et fonctionnelle tient compte de considérations comme l'expertise du tribunal, la nature de la décision qui est prise, et le libellé de la disposition et des lois qui s'y rapportent. Elle comprend des facteurs comme le caractère «polycentrique» d'une décision et l'intention exprimée par le langage employé par la loi. La latitude que laisse le Parlement au décideur administratif et la nature de la décision qui est prise sont également d'importantes considérations dans l'analyse. La gamme de normes de contrôle peut comprendre le principe que, dans certains cas, la législature a fait part de son intention de laisser des choix plus grands aux décideurs que dans d'autres, mais qu'il faut qu'un tribunal intervienne quand une telle décision dépasse l'étendue du pouvoir conféré par le Parlement. Enfin, je signalerais que notre Cour a déjà appliqué ce cadre à des dispositions législatives qui accordent une latitude importante à des organismes administratifs, par exemple, en contrôlant l'exercice des pouvoirs de réparation conférés par la loi en cause dans l'arrêt *Southam*, précité.

Incorporating judicial review of decisions that involve considerable discretion into the pragmatic and functional analysis for errors of law should not be seen as reducing the level of deference given to decisions of a highly discretionary nature. In fact, deferential standards of review may give substantial leeway to the discretionary decision-maker in determining the "proper purposes" or "relevant considerations" involved in making a given determination. The pragmatic and functional approach can take into account the fact that the more discretion that is left to a decision-maker, the more reluctant courts should be to interfere with the manner in which decision-makers have made choices among various options. However, though discretionary decisions will generally be given considerable respect, that discretion must be exercised in accordance with the boundaries imposed in the statute, the principles of the rule of law, the principles of administrative law, the fundamental values of Canadian society, and the principles of the *Charter*.

56 L'intégration du contrôle judiciaire de décisions comportant un large pouvoir discrétionnaire dans l'analyse pragmatique et fonctionnelle en raison d'erreurs de droit ne devrait pas être considérée comme une diminution du niveau de retenue accordé aux décisions de nature hautement discrétionnaire. En fait, des normes de contrôle judiciaire empreintes de retenue peuvent donner au décideur discrétionnaire une grande liberté d'action dans la détermination des «objectifs appropriés» ou des «considérations pertinentes». La démarche pragmatique et fonctionnelle peut tenir compte du fait que plus le pouvoir discrétionnaire accordé à un décideur est grand, plus les tribunaux devraient hésiter à intervenir dans la manière dont les décideurs ont choisi entre diverses options. Toutefois, même si, en général, il sera accordé un grand respect aux décisions discrétionnaires, il faut que le pouvoir discrétionnaire soit exercé conformément aux limites imposées dans la loi, aux principes de la primauté du droit, aux principes du droit administratif, aux valeurs fondamentales de la société canadienne, et aux principes de la *Charte*.

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(2) The Standard of Review in This Case

57 I turn now to an application of the pragmatic and functional approach to determine the appropriate standard of review for decisions made under s. 114(2) and Regulation 2.1, and the factors affecting the determination of that standard outlined in *Pushpanathan*, *supra*. It was held in that case that the decision, which related to the determination of a question of law by the Immigration and Refugee Board, was subject to a standard of review of correctness. Although that decision was also one made under the *Immigration Act*, the type of decision at issue was very different, as was the decision-maker. The appropriate standard of review must, therefore, be considered separately in the present case.

58 The first factor to be examined is the presence or absence of a privative clause, and, in appropriate cases, the wording of that clause: *Pushpanathan*, at para. 30. There is no privative clause contained in the *Immigration Act*, although judicial review cannot be commenced without leave of the Federal Court — Trial Division under s. 82.1. As mentioned above, s. 83(1) requires the certification of a "serious question of general importance" by the Federal Court — Trial Division before that decision may be appealed to the Court of Appeal. *Pushpanathan* shows that the existence of this provision means there should be a lower level of deference on issues related to the certified question itself. However, this is only one of the factors involved in determining the standard of review, and the others must also be considered.

59 The second factor is the expertise of the decision-maker. The decision-maker here is the Minister of Citizenship and Immigration or his or her delegate. The fact that the formal decision-maker is the Minister is a factor militating in favour of deference. The Minister has some expertise relative to courts in immigration matters, particularly with respect to when exemptions should be given from the requirements that normally apply.

(2) La norme de contrôle en l'espèce

J'examine maintenant l'application de la démarche pragmatique et fonctionnelle pour déterminer la norme de contrôle appropriée à l'égard de décisions rendues en vertu du par. 114(2) et de l'art. 2.1 du règlement, et les facteurs à considérer mis en évidence dans l'arrêt *Pushpanathan*, précité. Cet arrêt conclut que la décision, qui se rapportait à la détermination d'une question de droit par la Commission de l'immigration et du statut de réfugié, devait respecter la norme de la décision correcte. Bien qu'elle ait également été rendue sous le régime de la *Loi sur l'immigration*, la décision en litige était très différente, tout comme l'était le décideur. Il faut donc évaluer la norme de contrôle appropriée distinctement dans la présente affaire.

Le premier facteur à examiner est la présence ou l'absence d'une clause privative et, le cas échéant, le libellé de cette clause: *Pushpanathan*, au par. 30. La *Loi sur l'immigration* ne contient pas de clause privative, mais le contrôle judiciaire ne peut se faire sans l'autorisation de la Cour fédérale, Section de première instance, selon l'art. 82.1. Comme je l'ai dit précédemment, le par. 83(1) exige la certification d'une «question grave de portée générale» par la Cour fédérale, Section de première instance, pour que cette décision puisse être portée en appel devant la Cour d'appel. L'arrêt *Pushpanathan* montre que l'existence de cette disposition signifie un degré moindre de retenue à l'égard des points litigieux liés à la question certifiée. Toutefois, il ne s'agit que de l'un des facteurs à considérer pour déterminer la norme de contrôle, et il faut également évaluer les autres.

Le deuxième facteur est l'expertise du décideur. En l'espèce, le décideur est le ministre de la Citoyenneté et de l'Immigration ou son représentant. Le fait que, officiellement, le décideur soit le ministre est un facteur militant en faveur de la retenue. Le ministre a une certaine expertise par rapport aux tribunaux en matière d'immigration, surtout en ce qui concerne les dispenses d'application des exigences habituelles.

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The third factor is the purpose of the provision in particular, and of the Act as a whole. This decision involves considerable choice on the part of the Minister in determining when humanitarian and compassionate considerations warrant an exemption from the requirements of the Act. The decision also involves applying relatively "open-textured" legal principles, a factor militating in favour of greater deference: *Pushpanathan*, *supra*, at para. 36. The purpose of the provision in question is also to exempt applicants, in certain circumstances, from the requirements of the Act or its Regulations. This factor, too, is a signal that greater deference should be given to the Minister. However, it should also be noted, in favour of a stricter standard, that this decision relates directly to the rights and interests of an individual in relation to the government, rather than balancing the interests of various constituencies or mediating between them. Its purpose is to decide whether the admission to Canada of a particular individual, in a given set of circumstances, should be facilitated.

60 Le troisième facteur est l'objet de la disposition en particulier, et de la Loi dans son ensemble. Cette décision implique une grande latitude pour le ministre qui doit décider si des raisons d'ordre humanitaire justifient une dispense des exigences de la Loi. La décision commande aussi l'application de principes juridiques relativement peu «limitatifs», un facteur militant en faveur d'une plus grande retenue: *Pushpanathan*, précité, au par. 36. L'objet de la disposition en question est également de dispenser les demandeurs, dans certaines circonstances, des exigences de la Loi ou de son règlement. Ce facteur joue aussi en faveur d'une plus grande retenue envers la décision du ministre. Toutefois, il faut également signaler, en faveur d'une norme plus stricte, que cette décision vise directement les droits et les intérêts d'un individu par rapport au gouvernement plutôt qu'elle n'évalue ou ne pondère les intérêts de divers groupes. Le but de la décision est de déterminer si l'admission au Canada d'un individu particulier, dans des circonstances données, devrait être facilitée.

The fourth factor outlined in *Pushpanathan* considers the nature of the problem in question, especially whether it relates to the determination of law or facts. The decision about whether to grant an H & C exemption involves a considerable appreciation of the facts of that person's case, and is not one which involves the application or interpretation of definitive legal rules. Given the highly discretionary and fact-based nature of this decision, this is a factor militating in favour of deference.

61 Le quatrième facteur mis en relief dans l'arrêt *Pushpanathan* vise la nature du problème en question, particulièrement s'il s'agit de droit ou de faits. La décision d'accorder une dispense fondée sur des raisons d'ordre humanitaire demande principalement l'appréciation de faits relatifs au cas d'une personne, et ne porte pas sur l'application ni sur l'interprétation de règles de droit précises. Le fait que cette décision soit de nature hautement discrétionnaire et factuelle est un facteur qui milite en faveur de la retenue.

These factors must be balanced to arrive at the appropriate standard of review. I conclude that considerable deference should be accorded to immigration officers exercising the powers conferred by the legislation, given the fact-specific nature of the inquiry, its role within the statutory scheme as an exception, the fact that the decision-maker is the Minister, and the considerable discretion evidenced by the statutory language. Yet the absence of a privative clause, the explicit contemplation of judicial review by the Federal Court — Trial Division and the Federal Court of Appeal in certain circumstances, and the individual rather

62 Tous ces facteurs doivent être soupesés afin d'en arriver à la norme d'examen appropriée. Je conclus qu'on devrait faire preuve d'une retenue considérable envers les décisions d'agents d'immigration exerçant les pouvoirs conférés par la loi, compte tenu de la nature factuelle de l'analyse, de son rôle d'exception au sein du régime législatif, du fait que le décideur est le ministre, et de la large discrétion accordée par le libellé de la loi. Toutefois, l'absence de clause privative, la possibilité expressément prévue d'un contrôle judiciaire par la Cour fédérale, Section de première instance, et la Cour d'appel fédérale dans certaines circonstances, ainsi

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than polycentric nature of the decision, also suggest that the standard should not be as deferential as "patent unreasonableness". I conclude, weighing all these factors, that the appropriate standard of review is reasonableness *simpliciter*.

que la nature individuelle plutôt que polycentrique de la décision, tendent aussi à indiquer que la norme applicable ne devrait pas en être une d'aussi grande retenue que celle du caractère «manifestement déraisonnable». Je conclus, après avoir évalué tous ces facteurs, que la norme de contrôle appropriée est celle de la décision raisonnable *simpliciter*.

(3) Was this Decision Unreasonable?

(3) La décision était-elle déraisonnable?

63 I will next examine whether the decision in this case, and the immigration officer's interpretation of the scope of the discretion conferred upon him, were unreasonable in the sense contemplated in the judgment of Iacobucci J. in *Southam*, *supra*, at para. 56:

J'examinerai maintenant si la décision dans la présente affaire, et l'interprétation par l'agent d'immigration de l'étendue du pouvoir discrétionnaire qui lui était conféré, étaient déraisonnables au sens où l'entend le juge Iacobucci dans l'arrêt *Southam*, précité, au par. 56:

> An unreasonable decision is one that, in the main, is not supported by any reasons that can stand up to a somewhat probing examination. Accordingly, a court reviewing a conclusion on the reasonableness standard must look to see whether any reasons support it. The defect, if there is one, could presumably be in the evidentiary foundation itself or in the logical process by which conclusions are sought to be drawn from it.

> Est déraisonnable la décision qui, dans l'ensemble, n'est étayée par aucun motif capable de résister à un examen assez poussé. En conséquence, la cour qui contrôle une conclusion en regard de la norme de la décision raisonnable doit se demander s'il existe quelque motif étayant cette conclusion. Le défaut, s'il en est, pourrait découler de la preuve elle-même ou du raisonnement qui a été appliqué pour tirer les conclusions de cette preuve.

In particular, the examination of this question should focus on the issues arising from the "serious question of general importance" stated by Simpson J.: the question of the approach to be taken to the interests of children when reviewing an H & C decision.

L'examen de cette question devrait être axé sur les points découlant de la «question grave de portée générale» énoncée par le juge Simpson: la façon d'aborder la question de l'intérêt des enfants dans le contrôle d'une décision d'ordre humanitaire.

64 The notes of Officer Lorenz, in relation to the consideration of "H & C factors", read as follows:

Les notes de l'agent Lorenz relatives à l'examen des raisons d'ordre humanitaire, disent ceci:

> The PC is a paranoid schizophrenic and on welfare. She has no qualifications other than as a domestic. She has FOUR CHILDREN IN JAMAICA AND ANOTHER FOUR BORN HERE. She will, of course, be a tremendous strain on our social welfare systems for (probably) the rest of her life. There are no H&C factors other than her FOUR CANADIAN-BORN CHILDREN. Do we let her stay because of that? I am of the opinion that Canada can no longer afford this type of generosity.

> [TRADUCTION] PC est atteinte de schizophrénie paranoïde et reçoit l'assistance sociale. Elle n'a pas d'autres qualifications que de domestique. Elle a QUATRE ENFANTS EN JAMAÏQUE ET QUATRE AUTRES NÉS ICI. Elle sera, bien entendu, un fardeau excessif pour nos systèmes d'aide sociale (probablement) pour le reste de sa vie. Il n'existe pas d'autres facteurs d'ordre humanitaire que ses QUATRE ENFANTS NÉS AU CANADA. Devons-nous lui permettre de rester pour ça? Je suis d'avis que le Canada ne peut plus se permettre cette sorte de générosité.

65 In my opinion, the approach taken to the children's interests shows that this decision was unreasonable in the sense contemplated in *Southam*,

À mon avis, la façon dont elle traite l'intérêt des enfants montre que cette décision était déraisonnable au sens de l'arrêt *Southam*, précité. L'agent n'a

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supra. The officer was completely dismissive of the interests of Ms. Baker's children. As I will outline in detail in the paragraphs that follow, I believe that the failure to give serious weight and consideration to the interests of the children constitutes an unreasonable exercise of the discretion conferred by the section, notwithstanding the important deference that should be given to the decision of the immigration officer. Professor Dyzenhaus has articulated the concept of "deference as respect" as follows:

> Deference as respect requires not submission but a respectful attention to the reasons offered or which could be offered in support of a decision. . . .
>
> (D. Dyzenhaus, "The Politics of Deference: Judicial Review and Democracy", in M. Taggart, ed., *The Province of Administrative Law* (1997), 279, at p. 286.)

The reasons of the immigration officer show that his decision was inconsistent with the values underlying the grant of discretion. They therefore cannot stand up to the somewhat probing examination required by the standard of reasonableness.

The wording of s. 114(2) and of Regulation 2.1 requires that a decision-maker exercise the power based upon "compassionate or humanitarian considerations" (emphasis added). These words and their meaning must be central in determining whether an individual H & C decision was a reasonable exercise of the power conferred by Parliament. The legislation and regulations direct the Minister to determine whether the person's admission should be facilitated owing to the existence of such considerations. They show Parliament's intention that those exercising the discretion conferred by the statute act in a humanitarian and compassionate manner. This Court has found that it is necessary for the Minister to consider an H & C request when an application is made: *Jiminez-Perez*, *supra*. Similarly, when considering it, the request must be evaluated in a manner that is respectful of humanitarian and compassionate considerations.

prêté aucune attention à l'intérêt des enfants de M^me^ Baker. Comme je le démontrerai avec plus de détails dans les paragraphes qui suivent, j'estime que le défaut d'accorder de l'importance et de la considération à l'intérêt des enfants constitue un exercice déraisonnable du pouvoir discrétionnaire conféré par l'article, même s'il faut exercer un degré élevé de retenue envers la décision de l'agent d'immigration. Le professeur Dyzenhaus énonce ainsi la notion de la [TRADUCTION] «retenue au sens de respect»:

> [TRADUCTION] La retenue au sens de respect ne demande pas la soumission, mais une attention respectueuse aux motifs donnés ou qui pourraient être donnés à l'appui d'une décision . . .
>
> (D. Dyzenhaus, «The Politics of Deference: Judicial Review and Democracy», dans M. Taggart, dir., *The Province of Administrative Law* (1997), 279, à la p. 286.)

Les motifs de l'agent d'immigration démontrent que sa décision n'était pas compatible avec les valeurs sous-jacentes à l'octroi d'un pouvoir discrétionnaire. Ils ne peuvent donc pas résister à l'examen assez poussé qu'exige la norme du caractère raisonnable.

66 Le libellé du par. 114(2) et de l'art. 2.1 du règlement exige que le décideur exerce le pouvoir en se fondant sur «des raisons d'ordre humanitaire» (je souligne). Ces mots et leur sens doivent se situer au cœur de la réponse à la question de savoir si une décision d'ordre humanitaire particulière constituait un exercice raisonnable du pouvoir conféré par le Parlement. La loi et le règlement demandent au ministre de décider si l'admission d'une personne devrait être facilitée pour des raisons humanitaires. Ils démontrent que l'intention du Parlement est que ceux qui exercent le pouvoir discrétionnaire conféré par la loi agissent de façon humanitaire. Notre Cour a jugé que le ministre est tenu d'examiner les demandes d'ordre humanitaire qui sont présentées: *Jiminez-Perez*, précité. De même, quand il procède à cet examen, le ministre doit évaluer la demande d'une manière qui soit respectueuse des raisons d'ordre humanitaire.

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67 Determining whether the approach taken by the immigration officer was within the boundaries set out by the words of the statute and the values of administrative law requires a contextual approach, as is taken to statutory interpretation generally: see *R. v. Gladue*, [1999] 1 S.C.R. 688; *Rizzo & Rizzo Shoes Ltd. (Re)*, [1998] 1 S.C.R. 27, at paras. 20-23. In my opinion, a reasonable exercise of the power conferred by the section requires close attention to the interests and needs of children. Children's rights, and attention to their interests, are central humanitarian and compassionate values in Canadian society. Indications of children's interests as important considerations governing the manner in which H & C powers should be exercised may be found, for example, in the purposes of the Act, in international instruments, and in the guidelines for making H & C decisions published by the Minister herself.

(a) *The Objectives of the Act*

68 The objectives of the Act include, in s. 3(*c*):

to facilitate the reunion in Canada of Canadian citizens and permanent residents with their close relatives from abroad;

Although this provision speaks of Parliament's objective of reuniting citizens and permanent residents with their close relatives from abroad, it is consistent, in my opinion, with a large and liberal interpretation of the values underlying this legislation and its purposes to presume that Parliament also placed a high value on keeping citizens and permanent residents together with their close relatives who are already in Canada. The obligation to take seriously and place important weight on keeping children in contact with both parents, if possible, and maintaining connections between close family members is suggested by the objective articulated in s. 3(*c*).

(b) *International Law*

69 Another indicator of the importance of considering the interests of children when making a compassionate and humanitarian decision is the ratifi-

Afin de décider si la démarche de l'agent d'immigration respectait les limites imposées par le libellé de la loi et les valeurs du droit administratif, une analyse contextuelle est requise comme l'exige en général l'interprétation des lois: voir *R. c. Gladue*, [1999] 1 R.C.S. 688; *Rizzo & Rizzo Shoes Ltd. (Re)*, [1998] 1 R.C.S. 27, aux par. 20 à 23. À mon avis, l'exercice raisonnable du pouvoir conféré par l'article exige que soit prêtée une attention minutieuse aux intérêts et aux besoins des enfants. Les droits des enfants, et la considération de leurs intérêts, sont des valeurs d'ordre humanitaire centrales dans la société canadienne. Une indication que l'intérêt des enfants est une considération importante dans l'exercice des pouvoirs en matière humanitaire se trouve, par exemple, dans les objectifs de la Loi, dans les instruments internationaux, et dans les lignes directrices régissant les décisions d'ordre humanitaire publiées par le ministre lui-même.

a) *Les objectifs de la Loi*

Un des objectifs de la Loi est notamment, selon l'al. 3*c*):

de faciliter la réunion au Canada des citoyens canadiens et résidents permanents avec leurs proches parents de l'étranger;

Bien que cette disposition traite de l'objectif du Parlement de réunir des citoyens et des résidents permanents avec leurs proches parents de l'étranger, elle permet, à mon avis, en utilisant une interprétation large et libérale des valeurs sous-jacentes à cette loi et à son objet, de présumer que le Parlement estime important également de garder ensemble des citoyens et des résidents permanents avec leurs proches parents qui sont déjà au Canada. L'objectif à l'al. 3*c*) énonce l'obligation d'accorder une grande importance au maintien des enfants en contact avec leurs deux parents, si cela est possible, et au maintien du lien entre les membres d'une proche famille.

b) *Le droit international*

Un autre indice de l'importance de tenir compte de l'intérêt des enfants dans une décision d'ordre humanitaire est la ratification par le Canada de la

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cation by Canada of the *Convention on the Rights of the Child*, and the recognition of the importance of children's rights and the best interests of children in other international instruments ratified by Canada. International treaties and conventions are not part of Canadian law unless they have been implemented by statute: *Francis v. The Queen*, [1956] S.C.R. 618, at p. 621; *Capital Cities Communications Inc. v. Canadian Radio-Television Commission*, [1978] 2 S.C.R. 141, at pp. 172-73. I agree with the respondent and the Court of Appeal that the Convention has not been implemented by Parliament. Its provisions therefore have no direct application within Canadian law.

Nevertheless, the values reflected in international human rights law may help inform the contextual approach to statutory interpretation and judicial review. As stated in R. Sullivan, *Driedger on the Construction of Statutes* (3rd ed. 1994), at p. 330:

> [T]he legislature is presumed to respect the values and principles enshrined in international law, both customary and conventional. These constitute a part of the legal context in which legislation is enacted and read. In so far as possible, therefore, interpretations that reflect these values and principles are preferred. [Emphasis added.]

The important role of international human rights law as an aid in interpreting domestic law has also been emphasized in other common law countries: see, for example, *Tavita v. Minister of Immigration*, [1994] 2 N.Z.L.R. 257 (C.A.), at p. 266; *Vishaka v. Rajasthan*, [1997] 3 L.R.C. 361 (S.C. India), at p. 367. It is also a critical influence on the interpretation of the scope of the rights included in the *Charter*: *Slaight Communications*, *supra*; *R. v. Keegstra*, [1990] 3 S.C.R. 697.

The values and principles of the Convention recognize the importance of being attentive to the rights and best interests of children when decisions are made that relate to and affect their future. In addition, the preamble, recalling the *Universal Declaration of Human Rights*, recognizes that "childhood is entitled to special care and assis-

Convention relative aux droits de l'enfant, et la reconnaissance de l'importance des droits des enfants et de l'intérêt supérieur des enfants dans d'autres instruments internationaux ratifiés par le Canada. Les conventions et les traités internationaux ne font pas partie du droit canadien à moins d'être rendus applicables par la loi: *Francis c. The Queen*, [1956] R.C.S. 618, à la p. 621; *Capital Cities Communications Inc. c. Conseil de la Radio-Télévision canadienne*, [1978] 2 R.C.S. 141, aux pp. 172 et 173. Je suis d'accord avec l'intimé et la Cour d'appel que la Convention n'a pas été mise en vigueur par le Parlement. Ses dispositions n'ont donc aucune application directe au Canada.

70 Les valeurs exprimées dans le droit international des droits de la personne peuvent, toutefois, être prises en compte dans l'approche contextuelle de l'interprétation des lois et en matière de contrôle judiciaire. Comme le dit R. Sullivan, *Driedger on the Construction of Statutes* (3e éd. 1994), à la p. 330:

> [TRADUCTION] [L]a législature est présumée respecter les valeurs et les principes contenus dans le droit international, coutumier et conventionnel. Ces principes font partie du cadre juridique au sein duquel une loi est adoptée et interprétée. Par conséquent, dans la mesure du possible, il est préférable d'adopter des interprétations qui correspondent à ces valeurs et à ces principes. [Je souligne.]

D'autres pays de common law ont aussi mis en relief le rôle important du droit international des droits de la personne dans l'interprétation du droit interne: voir, par exemple, *Tavita c. Minister of Immigration*, [1994] 2 N.Z.L.R. 257 (C.A.), à la p. 266; *Vishaka c. Rajasthan*, [1997] 3 L.R.C. 361 (C.S. Inde), à la p. 367. Il a également une incidence cruciale sur l'interprétation de l'étendue des droits garantis par la *Charte*: *Slaight Communications*, précité; *R. c. Keegstra*, [1990] 3 R.C.S. 697.

71 Les valeurs et les principes de la Convention reconnaissent l'importance d'être attentif aux droits des enfants et à leur intérêt supérieur dans les décisions qui ont une incidence sur leur avenir. En outre, le préambule, rappelant la *Déclaration universelle des droits de l'homme*, reconnaît que «l'enfance a droit à une aide et à une assistance

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tance". A similar emphasis on the importance of placing considerable value on the protection of children and their needs and interests is also contained in other international instruments. The United Nations *Declaration of the Rights of the Child* (1959), in its preamble, states that the child "needs special safeguards and care". The principles of the Convention and other international instruments place special importance on protections for children and childhood, and on particular consideration of their interests, needs, and rights. They help show the values that are central in determining whether this decision was a reasonable exercise of the H & C power.

spéciales». D'autres instruments internationaux mettent également l'accent sur la grande valeur à accorder à la protection des enfants, à leurs besoins et à leurs intérêts. La *Déclaration des droits de l'enfant* (1959) de l'Organisation des Nations Unies, dans son préambule, dit que l'enfant «a besoin d'une protection spéciale et de soins spéciaux». Les principes de la Convention et d'autres instruments internationaux accordent une importance spéciale à la protection des enfants et de l'enfance, et à l'attention particulière que méritent leurs intérêts, besoins et droits. Ils aident à démontrer les valeurs qui sont essentielles pour déterminer si la décision en l'espèce constituait un exercice raisonnable du pouvoir en matière humanitaire.

(c) *The Ministerial Guidelines*

c) *Les lignes directrices ministérielles*

72 Third, the guidelines issued by the Minister to immigration officers recognize and reflect the values and approach discussed above and articulated in the Convention. As described above, immigration officers are expected to make the decision that a reasonable person would make, with special consideration of humanitarian values such as keeping connections between family members and avoiding hardship by sending people to places where they no longer have connections. The guidelines show what the Minister considers a humanitarian and compassionate decision, and they are of great assistance to the Court in determining whether the reasons of Officer Lorenz are supportable. They emphasize that the decision-maker should be alert to possible humanitarian grounds, should consider the hardship that a negative decision would impose upon the claimant or close family members, and should consider as an important factor the connections between family members. The guidelines are a useful indicator of what constitutes a reasonable interpretation of the power conferred by the section, and the fact that this decision was contrary to their directives is of great help in assessing whether the decision was an unreasonable exercise of the H & C power.

Troisièmement, les directives données par le ministre aux agents d'immigration reconnaissent et révèlent les valeurs et la démarche qui sont décrites ci-dessus et qui sont énoncées dans la Convention. Comme il est dit plus haut, les agents d'immigration sont censés rendre la décision qu'une personne raisonnable rendrait, en portant une attention particulière à des considérations humanitaires comme maintenir des liens entre les membres d'une famille et éviter de renvoyer des gens à des endroits où ils n'ont plus d'attaches. Les directives révèlent ce que le ministre considère comme une décision d'ordre humanitaire, et elles sont très utiles à notre Cour pour décider si les motifs de l'agent Lorenz sont valables. Elles soulignent que le décideur devrait être conscient des considérations humanitaires possibles, devrait tenir compte des difficultés qu'une décision défavorable imposerait au demandeur ou aux membres de sa famille proche, et devrait considérer comme un facteur important les liens entre les membres d'une famille. Les directives sont une indication utile de ce qui constitue une interprétation raisonnable du pouvoir conféré par l'article, et le fait que cette décision était contraire aux directives est d'une grande utilité pour évaluer si la décision constituait un exercice déraisonnable du pouvoir en matière humanitaire.

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The above factors indicate that emphasis on the rights, interests, and needs of children and special attention to childhood are important values that should be considered in reasonably interpreting the "humanitarian" and "compassionate" considerations that guide the exercise of the discretion. I conclude that because the reasons for this decision do not indicate that it was made in a manner which was alive, attentive, or sensitive to the interests of Ms. Baker's children, and did not consider them as an important factor in making the decision, it was an unreasonable exercise of the power conferred by the legislation, and must, therefore, be overturned. In addition, the reasons for decision failed to give sufficient weight or consideration to the hardship that a return to Jamaica might cause Ms. Baker, given the fact that she had been in Canada for 12 years, was ill and might not be able to obtain treatment in Jamaica, and would necessarily be separated from at least some of her children.

73 Les facteurs susmentionnés montrent que les droits, les intérêts, et les besoins des enfants, et l'attention particulière à prêter à l'enfance sont des valeurs importantes à considérer pour interpréter de façon raisonnable les raisons d'ordre humanitaire qui guident l'exercice du pouvoir discrétionnaire. Je conclus qu'étant donné que les motifs de la décision n'indiquent pas qu'elle a été rendue d'une manière réceptive, attentive ou sensible à l'intérêt des enfants de M^me^ Baker, ni que leur intérêt ait été considéré comme un facteur décisionnel important, elle constituait un exercice déraisonnable du pouvoir conféré par la loi et doit donc être infirmée. En outre, les motifs de la décision n'accordent pas suffisamment d'importance ou de poids aux difficultés qu'un retour en Jamaïque pouvait susciter pour M^me^ Baker, alors qu'elle avait passé 12 ans au Canada, qu'elle était malade et n'était pas assurée de pouvoir suivre un traitement en Jamaïque, et qu'elle serait forcément séparée d'au moins certains de ses enfants.

It follows that I disagree with the Federal Court of Appeal's holding in *Shah*, *supra*, at p. 239, that a s. 114(2) decision is "wholly a matter of judgment and discretion" (emphasis added). The wording of s. 114(2) and of the Regulations shows that the discretion granted is confined within certain boundaries. While I agree with the Court of Appeal that the Act gives the applicant no right to a particular outcome or to the application of a particular legal test, and that the doctrine of legitimate expectations does not mandate a result consistent with the wording of any international instruments, the decision must be made following an approach that respects humanitarian and compassionate values. Therefore, attentiveness and sensitivity to the importance of the rights of children, to their best interests, and to the hardship that may be caused to them by a negative decision is essential for an H & C decision to be made in a reasonable manner. While deference should be given to immigration officers on s. 114(2) judicial review applications, decisions cannot stand when the manner in which the decision was made and the approach taken are in conflict with humanitarian and compassionate values. The Minister's guidelines them-

74 Il en résulte que je ne suis pas d'accord avec la conclusion de la Cour d'appel fédérale dans l'arrêt *Shah*, précité, à la p. 239, qu'une décision en vertu du par. 114(2) «relève entièrement [du] jugement et [du] pouvoir discrétionnaire» (je souligne). Le libellé du par. 114(2) et du règlement montre que le pouvoir discrétionnaire conféré est assorti de limites. Bien que je sois d'accord avec la Cour d'appel que la Loi ne donne au demandeur aucun droit à un résultat précis ou à l'application d'un critère juridique particulier, et que la doctrine de l'attente légitime ne commande pas un résultat conforme au libellé d'instruments internationaux, la décision doit être prise suivant une démarche qui respecte les valeurs humanitaires. Par conséquent, l'attention et la sensibilité à l'importance des droits des enfants, de leur intérêt supérieur, et de l'épreuve qui pourrait leur être infligée par une décision défavorable sont essentielles pour qu'une décision d'ordre humanitaire soit raisonnable. Même s'il faut faire preuve de retenue dans le contrôle judiciaire de décisions rendues par les agents d'immigration en vertu du par. 114(2), ces décisions ne doivent pas être maintenues quand elles résultent d'une démarche ou sont elles-mêmes en

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selves reflect this approach. However, the decision here was inconsistent with it.

75 The certified question asks whether the best interests of children must be a primary consideration when assessing an applicant under s. 114(2) and the Regulations. The principles discussed above indicate that, for the exercise of the discretion to fall within the standard of reasonableness, the decision-maker should consider children's best interests as an important factor, give them substantial weight, and be alert, alive and sensitive to them. That is not to say that children's best interests must always outweigh other considerations, or that there will not be other reasons for denying an H & C claim even when children's interests are given this consideration. However, where the interests of children are minimized, in a manner inconsistent with Canada's humanitarian and compassionate tradition and the Minister's guidelines, the decision will be unreasonable.

E. *Conclusions and Disposition*

76 Therefore, both because there was a violation of the principles of procedural fairness owing to a reasonable apprehension of bias, and because the exercise of the H & C discretion was unreasonable, I would allow this appeal.

77 The appellant requested that solicitor-client costs be awarded to her if she were successful in her appeal. The majority of this Court held as follows in *Young v. Young*, [1993] 4 S.C.R. 3, at p. 134:

> Solicitor-client costs are generally awarded only where there has been reprehensible, scandalous or outrageous conduct on the part of one of the parties.

There has been no such conduct on the part of the Minister shown during this litigation, and I do not believe that this is one of the exceptional cases where solicitor-client costs should be awarded. I would allow the appeal, and set aside the decision of Officer Caden of April 18, 1994, with party-

conflit avec des valeurs humanitaires. Les directives du ministre elles-mêmes soutiennent cette approche. Toutefois, la décision en l'espèce était incompatible avec cette approche.

La question certifiée demande s'il faut considérer l'intérêt supérieur des enfants comme une considération primordiale dans l'examen du cas d'un demandeur sous le régime du par. 114(2) et du règlement. Les principes susmentionnés montrent que, pour que l'exercice du pouvoir discrétionnaire respecte la norme du caractère raisonnable, le décideur devrait considérer l'intérêt supérieur des enfants comme un facteur important, lui accorder un poids considérable, et être réceptif, attentif et sensible à cet intérêt. Cela ne veut pas dire que l'intérêt supérieur des enfants l'emportera toujours sur d'autres considérations, ni qu'il n'y aura pas d'autres raisons de rejeter une demande d'ordre humanitaire même en tenant compte de l'intérêt des enfants. Toutefois, quand l'intérêt des enfants est minimisé, d'une manière incompatible avec la tradition humanitaire du Canada et les directives du ministre, la décision est déraisonnable.

E. *Conclusions et dispositif*

En conséquence, parce qu'il y a eu manquement aux principes d'équité procédurale en raison d'une crainte raisonnable de partialité, et parce que l'exercice du pouvoir en matière humanitaire était déraisonnable, je suis d'avis d'accueillir le présent pourvoi.

L'appelante a demandé que lui soient adjugés les dépens comme entre procureur et client si elle avait gain de cause dans son pourvoi. Notre Cour a conclu à la majorité dans l'arrêt *Young c. Young*, [1993] 4 R.C.S. 3, à la p. 134:

> Les dépens comme entre procureur et client ne sont généralement accordés que s'il y a eu conduite répréhensible, scandaleuse ou outrageante d'une des parties.

Il n'a pas été démontré que le ministre a eu une telle conduite au cours du présent litige, et je ne crois pas qu'il s'agisse d'un des cas exceptionnels où les dépens devraient être adjugés comme entre procureur et client. Je suis d'avis d'accueillir le pourvoi, et d'annuler la décision de l'agent Caden

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and-party costs throughout. The matter will be returned to the Minister for redetermination by a different immigration officer.

The reasons of Cory and Iacobucci JJ. were delivered by

IACOBUCCI J. — I agree with L'Heureux-Dubé J.'s reasons and disposition of this appeal, except to the extent that my colleague addresses the effect of international law on the exercise of ministerial discretion pursuant to s. 114(2) of the *Immigration Act*, R.S.C., 1985, c. I-2. The certified question at issue in this appeal concerns whether federal immigration authorities must treat the best interests of the child as a primary consideration in assessing an application for humanitarian and compassionate consideration under s. 114(2) of the Act, given that the legislation does not implement the provisions contained in the *Convention on the Rights of the Child*, Can. T.S. 1992 No. 3, a multilateral convention to which Canada is party. In my opinion, the certified question should be answered in the negative.

It is a matter of well-settled law that an international convention ratified by the executive branch of government is of no force or effect within the Canadian legal system until such time as its provisions have been incorporated into domestic law by way of implementing legislation: *Capital Cities Communications Inc. v. Canadian Radio-Television Commission*, [1978] 2 S.C.R. 141. I do not agree with the approach adopted by my colleague, wherein reference is made to the underlying values of an unimplemented international treaty in the course of the contextual approach to statutory interpretation and administrative law, because such an approach is not in accordance with the Court's jurisprudence concerning the status of international law within the domestic legal system.

In my view, one should proceed with caution in deciding matters of this nature, lest we adversely affect the balance maintained by our Parliamentary tradition, or inadvertently grant the executive the

en date du 18 avril 1994, avec les dépens entre parties dans toutes les cours. L'affaire sera renvoyée au ministre pour qu'un agent d'immigration différent rende une nouvelle décision.

Version française des motifs des juges Cory et Iacobucci rendus par

LE JUGE IACOBUCCI — Je souscris aux motifs du 78
juge L'Heureux-Dubé et au dispositif qu'elle propose dans le présent pourvoi, sauf pour la question de l'effet du droit international sur l'exercice du pouvoir discrétionnaire conféré au ministre par le par. 114(2) de la *Loi sur l'immigration*, L.R.C. (1985), ch. I-2. La question certifiée en l'espèce vise à déterminer si les autorités d'immigration fédérales doivent traiter l'intérêt supérieur de l'enfant comme une considération primordiale dans l'examen d'une demande fondée sur des raisons d'ordre humanitaire en vertu du par. 114(2) de la Loi, alors que cette loi ne donne pas effet aux dispositions de la *Convention relative aux droits de l'enfant*, R.T. Can. 1992 nº 3, une convention multilatérale dont le Canada est signataire. À mon avis, la question certifiée devrait recevoir une réponse négative.

Il est bien établi qu'une convention internationale ratifiée par le pouvoir exécutif n'a aucun effet 79
en droit canadien tant que ses dispositions ne sont pas incorporées dans le droit interne par une loi les rendant applicables: *Capital Cities Communications Inc. c. Conseil de la Radio-Télévision canadienne*, [1978] 2 R.C.S. 141. Je ne suis pas d'accord avec l'analyse de ma collègue lorsqu'elle se réfère aux valeurs sous-jacentes à un traité international non-applicable dans une approche contextuelle de l'interprétation des lois et du droit administratif, parce qu'une telle approche n'est pas conforme à la jurisprudence de la Cour sur la question du statut du droit international dans le système juridique interne.

À mon avis, il faut aborder avec prudence des 80
décisions de ce genre, sous peine de rompre l'équilibre établi par notre tradition parlementaire ou de conférer par inadvertance à l'exécutif le pouvoir de

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power to bind citizens without the necessity of involving the legislative branch. I do not share my colleague's confidence that the Court's precedent in *Capital Cities*, *supra*, survives intact following the adoption of a principle of law which permits reference to an unincorporated convention during the process of statutory interpretation. Instead, the result will be that the appellant is able to achieve indirectly what cannot be achieved directly, namely, to give force and effect within the domestic legal system to international obligations undertaken by the executive alone that have yet to be subject to the democratic will of Parliament.

lier les administrés sans la participation du pouvoir législatif. Je ne partage pas la certitude de ma collègue que le précédent établi par notre Cour dans *Capital Cities*, précité, peut survivre intact après l'adoption d'un principe de droit qui autorise le recours, dans le processus d'interprétation des lois, aux dispositions d'une convention qui n'a pas été intégrée dans la législation. Au lieu de cela, le résultat sera que l'appelante pourra parvenir indirectement à ce qu'elle ne peut faire directement, c'est-à-dire donner effet dans le système juridique interne à des obligations internationales assumées par le pouvoir exécutif seul et qui n'ont pas encore été soumises à la volonté démocratique du Parlement.

81 The primacy accorded to the rights of children in the Convention, assuming for the sake of argument that the factual circumstances of this appeal are included within the scope of the relevant provisions, is irrelevant unless and until such provisions are the subject of legislation enacted by Parliament. In answering the certified question in the negative, I am mindful that the result may well have been different had my colleague concluded that the appellant's claim fell within the ambit of rights protected by the *Canadian Charter of Rights and Freedoms*. Had this been the case, the Court would have had an opportunity to consider the application of the interpretive presumption, established by the Court's decision in *Slaight Communications Inc. v. Davidson*, [1989] 1 S.C.R. 1038, and confirmed in subsequent jurisprudence, that administrative discretion involving *Charter* rights be exercised in accordance with similar international human rights norms.

La primauté donnée aux droits des enfants dans la Convention — à supposer pour les fins de la discussion que les faits du pourvoi ressortissent aux dispositions pertinentes — est sans effet tant et aussi longtemps que ces dispositions n'ont pas été incorporées par une loi adoptée par le Parlement. En donnant une réponse négative à la question certifiée, je suis conscient du fait que le résultat aurait pu être différent si ma collègue avait conclu que la demande de l'appelante relevait de l'application des droits garantis par la *Charte canadienne des droits et libertés*. Si cela avait été le cas, la Cour aurait eu la possibilité d'envisager l'application de la présomption interprétative établie par notre Cour dans l'arrêt *Slaight Communications Inc. c. Davidson*, [1989] 1 R.C.S. 1038, et confirmée dans la jurisprudence qui a suivi, selon laquelle le pouvoir administratif discrétionnaire touchant des droits garantis par la *Charte* doit être exercé en conformité avec des normes internationales similaires en matière de droits de la personne.

Appeal allowed with costs.

Pourvoi accueilli avec dépens.

Solicitors for the appellant: Roger Rowe and Rocco Galati, North York.

Procureurs de l'appelante: Roger Rowe et Rocco Galati, North York.

Solicitor for the respondent: The Deputy Attorney General of Canada, Toronto.

Procureur de l'intimé: Le sous-procureur général du Canada, Toronto.

Solicitor for the interveners the Canadian Foundation for Children, Youth and the Law, the Defence for Children International-Canada, and

Procureur des intervenants la Canadian Foundation for Children, Youth and the Law, la Défense des enfants-International-Canada et le

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the Canadian Council for Refugees: The Canadian Foundation for Children, Youth and the Law, Toronto.

Solicitors for the intervener the Charter Committee on Poverty Issues: Tory, Tory, DesLauriers & Binnington, Toronto.

Solicitors for the intervener the Canadian Council of Churches: Jackman and Associates, Toronto.

Conseil canadien pour les réfugiés: La Canadian Foundation for Children, Youth and the Law, Toronto.

Procureurs de l'intervenant le Comité de la Charte et des questions de pauvreté: Tory, Tory, DesLauriers & Binnington, Toronto.

Procureurs de l'intervenant le Conseil canadien des églises: Jackman and Associates, Toronto.

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Minister of Citizenship and Immigration *Appellant*

v.

Alexander Vavilov *Respondent*

and

Attorney General of Ontario,
Attorney General of Quebec,
Attorney General of British Columbia,
Attorney General of Saskatchewan,
Canadian Council for Refugees,
Advocacy Centre for Tenants Ontario - Tenant Duty Counsel Program,
Ontario Securities Commission,
British Columbia Securities Commission,
Alberta Securities Commission,
Ecojustice Canada Society,
Workplace Safety and Insurance Appeals Tribunal (Ontario),
Workers' Compensation Appeals Tribunal (Northwest Territories and Nunavut),
Workers' Compensation Appeals Tribunal (Nova Scotia),
Appeals Commission for Alberta Workers' Compensation,
Workers' Compensation Appeals Tribunal (New Brunswick),
British Columbia International Commercial Arbitration Centre Foundation,
Council of Canadian Administrative Tribunals,
National Academy of Arbitrators,
Ontario Labour-Management Arbitrators' Association,
Conférence des arbitres du Québec,
Canadian Labour Congress,
National Association of Pharmacy Regulatory Authorities,
Queen's Prison Law Clinic,
Advocates for the Rule of Law,
Parkdale Community Legal Services,
Cambridge Comparative Administrative Law Forum,

Ministre de la Citoyenneté et de l'Immigration *Appelant*

c.

Alexander Vavilov *Intimé*

et

Procureur général de l'Ontario,
procureure générale du Québec,
procureur général de la Colombie-Britannique,
procureur général de la Saskatchewan,
Conseil canadien pour les réfugiés,
Centre ontarien de défense des droits des locataires - Programme d'avocats de service en droit du logement,
Commission des valeurs mobilières de l'Ontario,
British Columbia Securities Commission,
Alberta Securities Commission,
Ecojustice Canada Society,
Tribunal d'appel de la sécurité professionnelle et de l'assurance contre les accidents du travail (Ontario),
Workers' Compensation Appeals Tribunal (Territoires du Nord-Ouest et Nunavut),
Tribunal d'appel des décisions de la Commission des accidents du travail de la Nouvelle-Écosse,
Appeals Commission for Alberta Workers' Compensation,
Tribunal d'appel des accidents au travail (Nouveau-Brunswick),
British Columbia International Commercial Arbitration Centre Foundation,
Conseil des tribunaux administratifs canadiens,
National Academy of Arbitrators,
Ontario Labour-Management Arbitrators' Association,
Conférence des arbitres du Québec,
Congrès du travail du Canada,
Association nationale des organismes de réglementation de la pharmacie,
Queen's Prison Law Clinic,
Advocates for the Rule of Law,

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Samuelson-Glushko Canadian Internet Policy and Public Interest Clinic, Canadian Bar Association, Canadian Association of Refugee Lawyers, Community & Legal Aid Services Programme, Association québécoise des avocats et avocates en droit de l'immigration and First Nations Child & Family Caring Society of Canada *Interveners*

Parkdale Community Legal Services, Cambridge Comparative Administrative Law Forum, Clinique d'intérêt public et de politique d'internet du Canada Samuelson-Glushko, Association du Barreau canadien, Association canadienne des avocats et avocates en droit des réfugiés, Community & Legal Aid Services Programme, Association québécoise des avocats et avocates en droit de l'immigration et Société de soutien à l'enfance et à la famille des Premières Nations du Canada *Intervenants*

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INDEXED AS: CANADA (MINISTER OF CITIZENSHIP AND IMMIGRATION) *v.* VAVILOV

2019 SCC 65

File No.: 37748.

2018: December 4, 5, 6; 2019: December 19.

Present: Wagner C.J. and Abella, Moldaver, Karakatsanis, Gascon, Côté, Brown, Rowe and Martin JJ.

RÉPERTORIÉ : CANADA (MINISTRE DE LA CITOYENNETÉ ET DE L'IMMIGRATION) *c.* VAVILOV

2019 CSC 65

N° du greffe : 37748.

2018 : 4, 5, 6 décembre; 2019 : 19 décembre.

Présents : Le juge en chef Wagner et les juges Abella, Moldaver, Karakatsanis, Gascon, Côté, Brown, Rowe et Martin.

ON APPEAL FROM THE FEDERAL COURT OF APPEAL

Administrative law — Judicial review — Standard of review — Proper approach to judicial review of administrative decisions — Proper approach to reasonableness review.

Citizenship — Canadian citizens — Registrar of Citizenship cancelling certificate of Canadian citizenship issued to Canadian-born son of parents later revealed to be Russian spies — Decision of Registrar based on interpretation of statutory exception to general rule that person born in Canada is Canadian citizen — Exception stating that Canadian-born child is not citizen if either parent was representative or employee in Canada of foreign government at time of child's birth — Whether Registrar's decision to cancel certificate of citizenship was reasonable — Citizenship Act, R.S.C. 1985, c. C-29, s. 3(2)(a).

EN APPEL DE LA COUR D'APPEL FÉDÉRALE

Droit administratif — Contrôle judiciaire — Norme de contrôle — Démarche appropriée pour le contrôle judiciaire des décisions administratives — Démarche appropriée pour l'application de la norme de la décision raisonnable.

Citoyenneté — Citoyens canadiens — Annulation par la greffière de la citoyenneté du certificat de citoyenneté canadienne délivré au fils né au Canada de parents qui se sont plus tard révélés être des espions russes — Décision rendue par la greffière sur son interprétation de l'exception prévue par la loi à l'égard de la règle générale suivant laquelle les personnes nées au Canada ont la citoyenneté canadienne — Exception précisant qu'un enfant né au Canada n'est pas citoyen canadien si, au moment de sa naissance, son père ou sa mère était représentant ou au service au Canada d'un gouvernement étranger — La décision de la greffière d'annuler le certificat de citoyenneté était-elle raisonnable? — Loi sur la citoyenneté, L.R.C. 1985, c. C-29, art. 3(2)a).

V was born in Toronto in 1994. At the time of his birth, his parents were posing as Canadians under assumed names. In reality, they were foreign nationals working on assignment for the Russian foreign intelligence service. V did not know that his parents were not who they claimed to be. He believed that he was a Canadian citizen by birth, he lived and identified as a Canadian, and he held a Canadian passport. In 2010, V's parents were arrested in the United States and charged with espionage. They pled guilty and were returned to Russia. Following their arrest, V's attempts to renew his Canadian passport proved unsuccessful. However, in 2013, he was issued a certificate of Canadian citizenship.

Then, in 2014, the Canadian Registrar of Citizenship cancelled V's certificate on the basis of her interpretation of s. 3(2)(a) of the *Citizenship Act*. This provision exempts children of "a diplomatic or consular officer or other representative or employee in Canada of a foreign government" from the general rule that individuals born in Canada acquire Canadian citizenship by birth. The Registrar concluded that because V's parents were employees or representatives of Russia at the time of V's birth, the exception to the rule of citizenship by birth in s. 3(2)(a), as she interpreted it, applied to V, who therefore was not, and had never been, entitled to citizenship. V's application for judicial review of the Registrar's decision was dismissed by the Federal Court. The Court of Appeal allowed V's appeal and quashed the Registrar's decision because it was unreasonable. The Minister of Citizenship and Immigration appeals.

Held: The appeal should be dismissed.

Per Wagner C.J. and Moldaver, Gascon, Côté, Brown, Rowe and Martin JJ.: The Registrar's decision to cancel V's certificate of citizenship was unreasonable, and the Court of Appeal's decision to quash it should be upheld. It was not reasonable for the Registrar to interpret s. 3(2)(a) of the *Citizenship Act* as applying to children of individuals who have not been granted diplomatic privileges and immunities at the time of the children's birth.

More generally, this appeal and its companion cases (*Bell Canada v. Canada (Attorney General)*, 2019 SCC 66, [2019] 4 S.C.R. 845) provide an opportunity to consider and clarify the law applicable to the judicial review of administrative decisions as addressed in *Dunsmuir v. New Brunswick*, 2008 SCC 9, [2008] 1 S.C.R. 190, and subsequent cases. The submissions presented to the Court

V est né à Toronto en 1994. Au moment de sa naissance, ses parents se font passer pour des Canadiens en utilisant des noms d'emprunt. En fait, ils sont des étrangers en mission pour le service des renseignements étrangers de la Russie. V ne sait pas que ses parents ne sont pas ceux qu'ils prétendent être. Il croit être citoyen canadien de naissance, il vit et s'identifie comme un Canadien, et il détient un passeport canadien. En 2010, les parents de V sont arrêtés aux États-Unis et accusés d'espionnage. Ils plaident coupables et sont renvoyés en Russie. Après leur arrestation, V tente en vain de renouveler son passeport canadien. On lui décerne toutefois en 2013 un certificat de citoyenneté canadienne.

Puis, en 2014, la greffière de la citoyenneté canadienne annule le certificat de V en se fondant sur son interprétation de l'al. 3(2)a) de la *Loi sur la citoyenneté*. Cette disposition exempte les enfants d'un « agent diplomatique ou consulaire, représentant à un autre titre ou au service au Canada d'un gouvernement étranger » de l'application de la règle générale selon laquelle les personnes nées au Canada ont la citoyenneté canadienne de naissance. La greffière conclut que, comme les parents de V étaient des employés ou représentants de la Russie au moment de la naissance de V, et selon l'interprétation qu'elle donne de l'exception prévue à l'al. 3(2)a) à l'égard de la règle de citoyenneté par la naissance, cette exception s'applique à V, qui n'a donc pas droit à la citoyenneté et n'y a jamais eu droit. La demande de contrôle judiciaire présentée par V à l'encontre de la décision de la greffière est rejetée par la Cour fédérale. La Cour d'appel accueille l'appel interjeté par V et casse la décision de la greffière parce qu'elle était déraisonnable. Le ministre de la Citoyenneté et de l'Immigration se pourvoit en appel.

Arrêt : Le pourvoi est rejeté.

Le juge en chef Wagner et les juges Moldaver, Gascon, Côté, Brown, Rowe et Martin : La décision de la greffière d'annuler le certificat de citoyenneté de V était déraisonnable, et il y a lieu de confirmer l'arrêt par lequel la Cour d'appel fédérale l'a cassée. La greffière ne pouvait raisonnablement interpréter l'al. 3(2)a) de la *Loi sur la citoyenneté* comme s'appliquant à un enfant dont les parents, au moment de sa naissance, ne s'étaient pas vu accorder des privilèges et immunités diplomatiques.

De façon plus générale, le présent pourvoi et les pourvois connexes (*Bell Canada c. Canada (Procureur général)*, 2019 CSC 66, [2019] 4 R.C.S. 845) donnent l'occasion d'analyser et de clarifier le droit applicable au contrôle judiciaire des décisions administratives tel que traité dans l'arrêt *Dunsmuir c. Nouveau-Brunswick*, 2008 CSC 9, [2008] 1 R.C.S. 190, et les arrêts subséquents. Les

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have highlighted two aspects of the current framework which need clarification. The first aspect is the analysis for determining the standard of review. The second aspect is the need for better guidance from this Court on the proper application of the reasonableness standard.

It has become clear that *Dunsmuir*'s promise of simplicity and predictability has not been fully realized. Certain aspects of the current standard of review framework are unclear and unduly complex. The former contextual analysis has proven to be unwieldy and offers limited practical guidance for courts attempting to determine the standard of review. The practical effect is that courts struggle in conducting the analysis, and debates surrounding the appropriate standard and its application continue to overshadow the review on the merits, thereby undermining access to justice. A reconsideration of the Court's approach is therefore necessary in order to bring greater coherence and predictability to this area of law. A revised framework to determine the standard of review where a court reviews the merits of an administrative decision is needed.

In setting out a revised framework, this decision departs from the Court's existing jurisprudence on standard of review in certain respects. Any reconsideration of past precedents can be justified only by compelling circumstances and requires carefully weighing the impact on legal certainty and predictability against the costs of continuing to follow a flawed approach. Although adhering to the established jurisprudence will generally promote certainty and predictability, in some instances doing so will create or perpetuate uncertainty. In such circumstances, following a prior decision would be contrary to the underlying values of clarity and certainty in the law.

The revised standard of review analysis begins with a presumption that reasonableness is the applicable standard in all cases. Where a legislature has created an administrative decision maker for the specific purpose of administering a statutory scheme, it must be presumed that the legislature also intended that decision maker to fulfill its mandate and interpret the law applicable to all issues that come before it. Where a legislature has not explicitly provided that a court is to have a more involved role in reviewing the decisions of that decision maker, it can safely

observations présentées à la Cour ont mis en relief deux aspects du cadre d'analyse actuel qu'il est nécessaire de clarifier. Le premier aspect concerne l'analyse visant à déterminer la norme de contrôle applicable. Le deuxième aspect concerne la nécessité d'indications plus précises de la Cour sur l'application appropriée de la norme de contrôle de la décision raisonnable.

Il est devenu évident que la promesse de simplicité et de prévisibilité formulée à cet égard dans l'arrêt *Dunsmuir* ne s'est pas pleinement réalisée. Certains aspects du cadre d'analyse actuel de la norme de contrôle ne sont pas clairs et sont indûment complexes. L'ancienne analyse contextuelle s'est révélée complexe et d'utilité limitée pour donner une orientation pratique aux cours de justice qui tentent de déterminer la norme de contrôle applicable. Ce manque de clarté a pour effet pratique que les cours de justice ont parfois de la difficulté à effectuer l'analyse relative à la norme de contrôle, et des débats entourant la norme appropriée et son application continuent d'éclipser le contrôle sur le fond, ce qui mine l'accès à la justice. Il est donc nécessaire de revoir l'approche de la Cour afin d'apporter une cohérence et une prévisibilité accrues à ce domaine du droit. Un cadre d'analyse révisé servant à déterminer la norme de contrôle applicable lorsqu'une cour de justice se penche sur le fond d'une décision administrative s'impose.

En exposant un cadre d'analyse révisé, la présente décision s'écarte à certains égards de la jurisprudence actuelle de la Cour sur la norme de contrôle. Seules des circonstances convaincantes peuvent justifier un réexamen des précédents antérieurs et il faut soupeser soigneusement l'incidence de ce réexamen sur la certitude et la prévisibilité juridiques par rapport aux coûts liés au fait de continuer à souscrire à une approche erronée. Si le respect de la jurisprudence établie favorise généralement la certitude et la prévisibilité, dans certains cas, ce respect crée ou perpétue l'incertitude du droit. Dans ces circonstances, en suivant l'arrêt antérieur, on se trouve à aller à l'encontre des valeurs fondamentales de la clarté et de la certitude du droit.

Le cadre d'analyse révisé de la norme de contrôle repose sur la présomption voulant que la norme de la décision raisonnable soit la norme applicable dans tous les cas. Si le législateur a constitué un décideur administratif dans le but précis d'administrer un régime législatif, il faut présumer que le législateur a également voulu que ce décideur soit en mesure d'accomplir son mandat et d'interpréter la loi qui s'applique à toutes les questions qui lui sont soumises. Si le législateur n'a pas prescrit expressément que les cours de justice ont un rôle plus actif à jouer dans

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be assumed that the legislature intended a minimum of judicial interference. Respect for these institutional design choices requires a reviewing court to adopt a posture of restraint. Thus, whenever a court reviews an administrative decision, it should start with the presumption that the applicable standard of review for all aspects of that decision will be reasonableness. As a result, it is no longer necessary for courts to engage in a contextual inquiry in order to identify the appropriate standard. Conclusively closing the door on the application of a contextual analysis to determine the applicable standard streamlines and simplifies the standard of review framework. As well, with the presumptive application of the reasonableness standard, the relative expertise of administrative decision makers is no longer relevant to a determination of the standard of review. It is simply folded into the new starting point. Relative expertise remains, however, a relevant consideration in conducting reasonableness review.

The presumption of reasonableness review can be rebutted in two types of situations. The first is where the legislature has indicated that it intends a different standard to apply. This will be the case where it has explicitly prescribed the applicable standard of review. Any framework rooted in legislative intent must respect clear statutory language. The legislature may also direct that derogation from the presumption is appropriate by providing for a statutory appeal mechanism from an administrative decision to a court, thereby signalling the legislature's intent that appellate standards apply when a court reviews the decision. Where a legislature has provided a statutory appeal mechanism, it has subjected the administrative regime to appellate oversight and it expects the court to scrutinize such administrative decisions on an appellate basis. The applicable standard is therefore to be determined with reference to the nature of the question and to the jurisprudence on appellate standards of review. Where, for example, a court hears an appeal from an administrative decision, it would apply the standard of correctness to questions of law, including on statutory interpretation and the scope of a decision maker's authority. Where the scope of the statutory appeal includes questions of fact or questions of mixed fact and law, the standard is palpable and overriding error for such questions.

le contrôle des décisions de ce décideur, on peut aisément présumer que le législateur a voulu que celui-ci puisse fonctionner en faisant le moins possible l'objet d'une intervention judiciaire. Le respect de ces choix d'organisation institutionnelle oblige la cour de révision à adopter une attitude de retenue. Donc, chaque fois qu'une cour examine une décision administrative, elle doit partir de la présomption que la norme de contrôle applicable à l'égard de tous les aspects de cette décision est celle de la décision raisonnable. En conséquence, les cours de justice ne sont plus tenues de recourir à une analyse contextuelle pour établir la norme de contrôle appropriée. Fermer de manière définitive la porte au recours à l'analyse contextuelle pour déterminer la norme de contrôle applicable a pour effet d'alléger et de simplifier le cadre d'analyse applicable à la norme de contrôle. De plus, étant donné la présomption d'application de la norme de la décision raisonnable, l'expertise relative des décideurs administratifs n'est plus pertinente pour déterminer la norme de contrôle applicable. Elle est tout simplement incorporée au nouveau point de départ. L'expertise relative demeure cependant pertinente lors de l'exercice du contrôle judiciaire selon la norme de la décision raisonnable.

La présomption d'application de la norme de la décision raisonnable peut être réfutée dans deux types de situations. La première est celle où le législateur a indiqué qu'il souhaite l'application d'une norme différente. C'est le cas lorsque le législateur a prescrit expressément la norme de contrôle applicable. Tout cadre d'analyse fondé sur l'intention du législateur doit respecter les dispositions législatives claires. Le législateur peut également indiquer qu'une dérogation à la présomption est de mise en prévoyant un mécanisme d'appel à l'encontre d'une décision administrative devant une cour de justice, indiquant ainsi son intention que les cours de justice recourent, en matière de contrôle, aux normes applicables en appel. Lorsqu'il prévoit dans la loi un mécanisme d'appel, le législateur assujettit le régime administratif à une compétence d'appel et indique qu'il s'attend à ce que la cour vérifie attentivement une telle décision administrative par voie d'appel. La norme de contrôle applicable doit donc être déterminée eu égard à la nature de la question et à la jurisprudence sur les normes de contrôle applicables en appel. Par exemple, lorsqu'une cour de justice entend l'appel d'une décision administrative, elle appliquera la norme de la décision correcte aux questions de droit, touchant notamment à l'interprétation législative et à la portée de la compétence du décideur. Si l'appel prévu par la loi porte notamment sur des questions de fait ou des questions mixtes de fait et de droit, la norme de contrôle applicable à ces questions sera celle de l'erreur manifeste et déterminante.

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Giving effect to statutory appeal mechanisms in this way departs from the Court's recent jurisprudence. This shift is necessary in order to bring coherence and conceptual balance to the standard of review analysis and is justified by weighing the values of certainty and correctness. First, there has been significant and valid judicial and academic criticism of the Court's recent approach to statutory appeal rights and of the inconsistency inherent in a standard of review framework based on legislative intent that otherwise declines to give meaning to an express statutory right of appeal. Second, there is no satisfactory justification for the recent trend in the Court's jurisprudence to give no effect to statutory rights of appeal in the standard of review analysis, absent exceptional wording. More generally, there is no convincing reason to presume that legislatures mean something entirely different when they use the word "appeal" in an administrative law statute. Accepting that the legislature intends an appellate standard of review to be applied also helps to explain why many statutes provide for both appeal and judicial review mechanisms, thereby indicating two roles for reviewing courts. Finally, because the presumption of reasonableness review is no longer premised upon notions of relative expertise and is now based on respect for the legislature's institutional design choice, departing from the presumption of reasonableness review in the context of a statutory appeal respects this legislative choice.

Donner un tel sens aux mécanismes d'appel prévus par la loi s'écarte de la jurisprudence récente de la Cour. Ce virage s'impose afin d'apporter uniformité et équilibre conceptuel à l'analyse relative à la norme de contrôle et il se justifie par la mise en balance des valeurs de la certitude et de la justesse. D'abord, d'importantes et valables critiques judiciaires et doctrinales ont été formulées au sujet de la conception que la Cour s'est faite des droits d'appel prévus par la loi et de l'incohérence inhérente à un cadre d'analyse de la norme de contrôle fondé sur l'intention du législateur qui refuse par ailleurs de donner un sens à un droit d'appel conféré expressément par la loi. Ensuite, rien ne justifie de façon satisfaisante la tendance récente de la Cour de ne pas tenir compte des droits d'appels conférés par la loi sauf en présence d'un libellé exceptionnel. De façon plus générale, il n'y a aucune raison convaincante de présumer que le législateur voulait que le mot « appel » revête un sens tout à fait différent dans une loi à caractère administratif. Accepter que le législateur souhaite le recours à une norme de contrôle applicable en appel permet également d'expliquer pourquoi bon nombre de textes législatifs prévoient à la fois des mécanismes d'appel et de contrôle judiciaire, conférant ainsi deux rôles possibles aux cours de révision. Enfin, puisque la présomption d'application de la norme de la décision raisonnable en cas de contrôle judiciaire n'est plus fondée sur la notion d'expertise relative et repose maintenant sur le respect du choix d'organisation institutionnelle de la part du législateur, la dérogation à la présomption de contrôle selon la décision raisonnable dans le cas d'un appel prévu par la loi respecte ce choix du législateur.

The second situation in which the presumption of reasonableness review will be rebutted is where the rule of law requires that the standard of correctness be applied. This will be the case for certain categories of legal questions, namely constitutional questions, general questions of law of central importance to the legal system as a whole and questions related to the jurisdictional boundaries between two or more administrative bodies. First, questions regarding the division of powers between Parliament and the provinces, the relationship between the legislature and the other branches of the state, the scope of Aboriginal and treaty rights under s. 35 of the *Constitution Act, 1982*, and other constitutional matters require a final and determinate answer from the courts. Second, the rule of law requires courts to have the final word with regard to general questions of law that are of central importance to the legal system as a whole because they require uniform and consistent answers. Third, the rule of law requires courts to intervene where one administrative body has interpreted the scope of its authority in a manner that is incompatible with the jurisdiction of another since the rule of law cannot

La deuxième situation où la présomption d'application de la norme de la décision raisonnable est réfutée est celle où la primauté du droit commande l'application de la norme de la décision correcte. C'est le cas pour certaines catégories de questions de droit, soit les questions constitutionnelles, les questions de droit générales d'importance capitale pour le système juridique dans son ensemble et les questions liées aux délimitations des compétences respectives d'organismes administratifs. Premièrement, les questions touchant au partage des compétences entre le Parlement et les provinces, au rapport entre le législateur et les autres organes de l'État, et à la portée des droits ancestraux et issus de traités reconnus à l'art. 35 de la *Loi constitutionnelle de 1982*, et d'autres questions de droit constitutionnel nécessitent une réponse décisive et définitive des cours de justice. Deuxièmement, la primauté du droit exige que les cours de justice tranchent de manière définitive les questions de droit générales qui sont d'importance capitale pour le système juridique dans son ensemble parce qu'elles requièrent des réponses uniformes et cohérentes. Troisièmement, la primauté du droit

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tolerate conflicting orders and proceedings where they result in a true operational conflict between two administrative bodies. The application of the correctness standard for such questions therefore respects the unique role of the judiciary in interpreting the Constitution and ensures that courts are able to provide the last word on questions for which the rule of law requires consistency and for which a final and determinate answer is necessary.

The general rule of reasonableness review, when coupled with these limited exceptions, offers a comprehensive approach to determining the applicable standard of review. The possibility that another category could be recognized as requiring a derogation from the presumption of reasonableness review in a future case is not definitively foreclosed. However, any new basis for correctness review would be exceptional and would need to be consistent with this framework and the overarching principles set out in this decision. Any new correctness category based on legislative intent would require a signal of legislative intent as strong and compelling as a legislated standard of review or a statutory appeal mechanism. Similarly, a new correctness category based on the rule of law would be justified only where failure to apply correctness review would undermine the rule of law and jeopardize the proper functioning of the justice system in a manner analogous to the three situations described in this decision.

For example, the Court is not persuaded that it should recognize a distinct correctness category for legal questions on which there is persistent discord within an administrative body. A lack of unanimity within an administrative tribunal is the price to pay for decision-making freedom and independence. While discord can lead to legal incoherence, a more robust form of reasonableness review is capable of guarding against such threats to the rule of law. As well, jurisdictional questions should no longer be recognized as a distinct category subject to correctness review; there are no clear markers to distinguish such questions from other questions related to interpreting an administrative

commande l'intervention des cours de justice lorsqu'un organisme administratif interprète l'étendue de ses pouvoirs d'une manière qui est incompatible avec la compétence d'un autre organisme administratif, car la primauté du droit ne saurait tolérer des ordonnances et des procédures qui entraînent un véritable conflit opérationnel entre deux organismes administratifs. L'application de la norme de la décision correcte à l'égard de ces questions s'accorde donc avec le rôle unique du pouvoir judiciaire dans l'interprétation de la Constitution, et fait en sorte que les cours de justice puissent avoir le dernier mot sur des questions à l'égard desquelles la primauté du droit exige une cohérence et une réponse décisive et définitive s'impose.

Conjuguée à ces exceptions limitées, la règle générale qui prévoit l'application de la norme de la décision raisonnable met en place une méthode complète pour déterminer la norme de contrôle applicable. On ne ferme pas définitivement la porte à la possibilité qu'une autre catégorie puisse ultérieurement être reconnue comme appelant une dérogation à la présomption de contrôle selon la norme de la décision raisonnable. Cependant, la reconnaissance de tout nouveau fondement pour l'application de la norme de la décision correcte devrait revêtir un caractère exceptionnel et devrait respecter ce cadre d'analyse et les principes prépondérants énoncés dans la présente décision. Toute nouvelle catégorie de questions qui commandent l'application de la norme de la décision correcte sur le fondement de l'intention du législateur devrait comporter une indication de cette volonté tout aussi solide et convaincante qu'une norme de contrôle établie par voie législative ou un mécanisme d'appel prévu par la loi. De la même manière, la reconnaissance d'une nouvelle catégorie de questions appelant la norme de la décision correcte sur le fondement de la primauté du droit ne serait justifiée que dans le cas où le défaut d'appliquer la norme de la décision correcte risquerait d'ébranler la primauté du droit et mettrait en péril le bon fonctionnement du système de justice d'une façon analogue aux trois situations décrites dans la présente décision.

Par exemple, la Cour n'est pas convaincue qu'elle devrait reconnaître l'existence d'une catégorie distincte de questions de droit qui appellent la norme de la décision correcte dans le cas où ces questions sèment constamment la discorde au sein d'un organisme administratif. L'absence d'unanimité parmi les membres d'un tribunal administratif est le prix à payer pour la liberté et l'indépendance décisionnelle. Bien que la discorde puisse mener à l'incohérence du droit, un cadre d'application plus rigoureux de la norme de la décision raisonnable permet de se prémunir face à ces menaces à la primauté du droit. En outre, les questions de compétence ne devraient plus

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decision maker's enabling statute. A proper application of the reasonableness standard will enable courts to ensure that administrative bodies have acted within the scope of their lawful authority without having to conduct a preliminary assessment on jurisdictional issues and without having to apply the correctness standard.

Going forward, a court seeking to determine what standard of review is appropriate should look to this decision first in order to determine how the general framework applies. Doing so may require the court to resolve subsidiary questions on which past precedents will often continue to provide helpful guidance and will continue to apply essentially without modification, such as cases concerning general questions of law of central importance to the legal system as a whole or those relating to jurisdictional boundaries between administrative bodies. On other issues, such as the effect of statutory appeal mechanisms, true questions of jurisdiction or the former contextual analysis, certain cases will necessarily have less precedential force.

There is also a need for better guidance from the Court on the proper application of the reasonableness standard, what that standard entails and how it should be applied in practice. Reasonableness review is meant to ensure that courts intervene in administrative matters only where it is truly necessary to do so in order to safeguard the legality, rationality and fairness of the administrative process. Its starting point lies in the principle of judicial restraint and in demonstrating respect for the distinct role of administrative decision makers. However, it is not a "rubber-stamping" process or a means of sheltering decision makers from accountability. While courts must recognize the legitimacy and authority of administrative decision makers and adopt a posture of respect, administrative decision makers must adopt a culture of justification and demonstrate that their exercise of delegated public power can be justified. In conducting reasonableness review, a court must consider the outcome of the administrative decision in light of its underlying rationale, to ensure that the decision as a whole is transparent, intelligible and justified. Judicial review is concerned with both the outcome of the decision and the reasoning process that led to that outcome. To accept otherwise would undermine, rather than demonstrate respect

être reconnues comme une catégorie distincte devant faire l'objet d'un contrôle selon la norme de la décision correcte; il n'existe aucune balise claire qui permet de distinguer ces questions de celles touchant à l'interprétation de sa loi habilitante par un décideur administratif. En appliquant adéquatement la norme de la décision raisonnable, les cours de justice sont en mesure de veiller à ce que les organismes administratifs agissent dans les limites des pouvoirs qui leur sont conférés sans qu'il soit nécessaire de procéder à un examen préliminaire des questions de compétence et sans avoir à recourir à la norme de la décision correcte.

À l'avenir, la cour de justice qui cherche à arrêter la norme de contrôle applicable devrait d'abord s'en remettre à la présente décision pour savoir comment s'applique le cadre général. Il est ainsi possible que la cour soit appelée à trancher des questions subsidiaires à l'égard desquelles la jurisprudence continue de donner des indications utiles et continue de s'appliquer essentiellement telle quelle, comme les affaires portant sur des questions de droit générales d'importance capitale pour le système de justice dans son ensemble ou sur des questions liées aux délimitations des compétences respectives d'organismes administratifs. Pour d'autres catégories de questions, certains arrêts, dont ceux portant sur l'effet des mécanismes d'appel prévus par la loi, sur des questions touchant véritablement à la compétence ou sur l'ancienne analyse contextuelle, auront forcément une valeur de précédent moindre.

En outre, la Cour doit donner des indications plus précises sur l'application appropriée de la norme de contrôle de la décision raisonnable, ce que signifie cette norme et comment elle devrait être appliquée en pratique. Le contrôle selon la norme de la décision raisonnable est une approche visant à faire en sorte que les cours de justice interviennent dans les affaires administratives uniquement lorsque cela est vraiment nécessaire pour préserver la légitimité, la rationalité et l'équité du processus administratif. Il tire son origine du principe de la retenue judiciaire et témoigne d'un respect envers le rôle distinct des décideurs administratifs. Toutefois, il ne s'agit pas d'une « simple formalité » ni d'un moyen visant à soustraire les décideurs administratifs à leur obligation de rendre des comptes. Bien que les cours de justice doivent reconnaître la légitimité et la compétence des décideurs administratifs et adopter une attitude de respect, les décideurs administratifs doivent adhérer à une culture de la justification et démontrer que l'exercice du pouvoir public qui leur est délégué peut être justifié. Lorsqu'elle effectue un contrôle selon la norme de la décision raisonnable, la cour de révision doit tenir compte du résultat de la décision administrative eu égard au raisonnement sous-jacent à celle-ci afin de

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toward, the institutional role of the administrative decision maker.

Reasonableness review is methodologically distinct from correctness review. The court conducting a reasonableness review must focus on the decision the administrative decision maker actually made, including the justification offered for it. A court applying the reasonableness standard does not ask what decision it would have made in place of the administrative decision maker, attempt to ascertain the range of possible conclusions, conduct a new analysis or seek to determine the correct solution to the problem. Instead, the reviewing court must consider only whether the decision made by the decision maker, including both the rationale for the decision and the outcome to which it led, was unreasonable.

In cases where reasons are required, they are the starting point for reasonableness review, as they are the primary mechanism by which decision makers show that their decisions are reasonable. Reasons are the means by which the decision maker communicates the rationale for its decision: they explain how and why a decision was made, help to show affected parties that their arguments have been considered and that the decision was made in a fair and lawful manner, and shield against arbitrariness. A principled approach to reasonableness review is therefore one which puts those reasons first. This enables a reviewing court to assess whether the decision as a whole is reasonable. Attention to the decision maker's reasons is part of how courts demonstrate respect for the decision-making process.

In many cases, formal reasons for a decision will not be given or required. Even without reasons, it is possible for the record and the context to reveal that a decision was made on the basis of an improper motive or for another impermissible reason. There will nonetheless be situations in which neither the record nor the larger context sheds light on the basis for the decision. In such cases, the reviewing court must still examine the decision in light of the relevant

s'assurer que la décision dans son ensemble est transparente, intelligible et justifiée. Le contrôle judiciaire porte à la fois sur le résultat et sur le raisonnement à l'origine de ce résultat. Une approche différente compromettrait le rôle institutionnel du décideur administratif plutôt que de le respecter.

Le contrôle selon la norme de la décision raisonnable est méthodologiquement distinct du contrôle selon la norme de la décision correcte. La cour de justice effectuant un contrôle selon la norme de la décision raisonnable doit centrer son attention sur la décision même qu'a rendue le décideur administratif, notamment sur sa justification. Une cour de justice qui applique la norme de contrôle de la décision raisonnable ne se demande donc pas quelle décision elle aurait rendue à la place du décideur administratif, ne tente pas de prendre en compte l'éventail des conclusions qu'aurait pu tirer le décideur, ne se livre pas à une analyse *de novo*, et ne cherche pas à déterminer la solution correcte au problème. La cour de révision n'est plutôt appelée qu'à décider du caractère raisonnable de la décision rendue par le décideur administratif — ce qui inclut à la fois le raisonnement suivi et le résultat obtenu.

Dans les cas où des motifs sont requis, ceux-ci constituent le point de départ du contrôle selon la norme de la décision raisonnable, car ils sont le mécanisme principal par lequel les décideurs administratifs démontrent le caractère raisonnable de leurs décisions. Les motifs sont le moyen par lequel le décideur communique la justification de sa décision : ils servent à expliquer le processus décisionnel et la raison d'être de la décision en cause, permettent de montrer aux parties concernées que leurs arguments ont été pris en compte et démontrent que la décision a été rendue de manière équitable et licite, en plus de servir de bouclier contre l'arbitraire. Toute méthode raisonnée de contrôle selon la norme de la décision raisonnable s'intéresse donc avant tout aux motifs de la décision. Cela permet à la cour de révision de déterminer si la décision dans son ensemble est raisonnable. L'attention accordée aux motifs formulés par le décideur est une manifestation de l'attitude de respect dont font preuve les cours de justice envers le processus décisionnel.

Dans de nombreux cas, les motifs écrits d'une décision ne sont ni présentés, ni nécessaires. Même en l'absence de motifs, il se peut que le dossier et le contexte révèlent qu'une décision repose sur un mobile irrégulier ou sur un autre motif inacceptable. Il existe néanmoins des situations dans lesquelles ni le dossier ni le contexte général ne permettent de discerner le fondement de la décision en cause. En pareil cas, la cour de révision doit tout de même

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factual and legal constraints on the decision maker in order to determine whether the decision is reasonable.

It is conceptually useful to consider two types of fundamental flaws that tend to render a decision unreasonable. The first is a failure of rationality internal to the reasoning process. To be reasonable, a decision must be based on an internally coherent reasoning that is both rational and logical. A failure in this respect may lead a reviewing court to conclude that a decision must be set aside. Reasonableness review is not a line-by-line treasure hunt for error. However, the reviewing court must be able to trace the decision maker's reasoning without encountering any fatal flaws in its overarching logic. Because formal reasons should be read in light of the record and with due sensitivity to the administrative regime in which they were given, a decision will be unreasonable if the reasons for it, read holistically, fail to reveal a rational chain of analysis or if they reveal that the decision was based on an irrational chain of analysis. A decision will also be unreasonable where the conclusion reached cannot follow from the analysis undertaken or if the reasons read in conjunction with the record do not make it possible to understand the decision maker's reasoning on a critical point. Similarly, the internal rationality of a decision may be called into question if the reasons exhibit clear logical fallacies.

The second type of fundamental flaw arises when a decision is in some respect untenable in light of the relevant factual and legal constraints that bear on it. Although reasonableness is a single standard that already accounts for context, and elements of a decision's context should not modulate the standard or the degree of scrutiny by the reviewing court, what is reasonable in a given situation will always depend on the constraints imposed by the legal and factual context of the particular decision under review. These contextual constraints dictate the limits and contours of the space in which the decision maker may act and the types of solutions it may adopt. The governing statutory scheme, other relevant statutory or common law, the principles of statutory interpretation, the evidence before the decision maker and facts of which the decision maker may take notice, the submissions of the parties, the past practices and decisions of the administrative body, and the potential impact of the decision on the individual to whom it applies, are all elements that will generally be relevant in evaluating whether a given decision is reasonable. Such elements are not a checklist; they may vary in significance

examiner la décision à la lumière des contraintes factuelles et juridiques imposées au décideur afin de déterminer s'il s'agit d'une décision raisonnable.

Il est utile, d'un point de vue conceptuel, de s'arrêter à deux catégories de lacunes fondamentales qui tendent à rendre une décision déraisonnable. La première est le manque de logique interne du raisonnement. Pour être raisonnable, une décision doit être fondée sur un raisonnement intrinsèquement cohérent qui est à la fois rationnel et logique. Un manquement à cet égard peut amener la cour de révision à conclure qu'il y a lieu d'infirmer la décision. Le contrôle selon la norme de la décision raisonnable n'est pas une chasse au trésor, phrase par phrase, à la recherche d'une erreur. Cependant, la cour de révision doit être en mesure de suivre le raisonnement du décideur sans buter sur une faille décisive dans la logique globale. Puisqu'il faut interpréter les motifs écrits eu égard au dossier et en tenant dûment compte du régime administratif dans lequel ils sont donnés, une décision sera déraisonnable lorsque, lus dans leur ensemble, les motifs ne font pas état d'une analyse rationnelle ou montrent que la décision est fondée sur une analyse irrationnelle. Une décision sera également déraisonnable si la conclusion tirée ne peut prendre sa source dans l'analyse effectuée ou qu'il est impossible de comprendre, lorsqu'on lit les motifs en corrélation avec le dossier, le raisonnement du décideur sur un point central. De même, la logique interne d'une décision peut également être remise en question lorsque les motifs sont entachés d'erreurs manifestes sur le plan rationnel.

La seconde catégorie de lacune fondamentale se présente dans le cas d'une décision indéfendable sous certains rapports compte tenu des contraintes factuelles et juridiques pertinentes qui ont une incidence sur la décision. Même si la norme de la décision raisonnable est une norme unique qui tient déjà compte du contexte, et les éléments du contexte entourant une décision ne doivent pas altérer cette norme ou le degré d'examen que doit appliquer une cour de révision, ce qui est raisonnable dans un cas donné dépend toujours des contraintes juridiques et factuelles propres au contexte de la décision particulière sous examen. Ces contraintes d'ordre contextuel cernent les limites et les contours de l'espace à l'intérieur duquel le décideur peut agir, ainsi que les types de solution qu'il peut retenir. Le régime législatif applicable, tout autre principe législatif ou principe de common law pertinent, les principes d'interprétation des lois, la preuve portée à la connaissance du décideur et les faits dont le décideur peut prendre connaissance d'office, les observations des parties, les pratiques et décisions antérieures de l'organisme administratif et

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depending on the context and will necessarily interact with one another.

Accordingly, a reviewing court may find that a decision is unreasonable when examined against these contextual considerations. Because administrative decision makers receive their powers by statute, the governing statutory scheme is likely to be the most salient aspect of the legal context relevant to a particular decision. A proper application of the reasonableness standard is capable of allaying the concern that an administrative decision maker might interpret the scope of its own authority beyond what the legislature intended. Whether an interpretation is justified will depend on the context, including the language chosen by the legislature in describing the limits and contours of the decision maker's authority.

Both statutory and common law will also impose constraints on how and what an administrative decision maker can lawfully decide. Any precedents on the issue before the administrative decision maker or on a similar issue, as well as international law in some administrative decision making contexts, will act as a constraint on what the decision maker can reasonably decide. Whether an administrative decision maker has acted reasonably in adapting a legal or equitable doctrine involves a highly context-specific determination.

Matters of statutory interpretation are not treated uniquely and, as with other questions of law, may be evaluated on a reasonableness standard. Where this is the applicable standard, the reviewing court does not undertake a *de novo* analysis of the question or ask itself what the correct decision would have been. But an approach to reasonableness review that respects legislative intent must assume that those who interpret the law, whether courts or administrative decision makers, will do so in a manner consistent with the modern principle of statutory interpretation. Administrative decision makers are not required to engage in a formalistic statutory interpretation exercise in every case. But whatever form the interpretive exercise takes, the merits of an administrative decision maker's interpretation of a statutory provision must be consistent with the text, context and purpose of the provision.

l'impact potentiel de la décision sur l'individu qui en fait l'objet sont tous des éléments qui sont généralement utiles pour déterminer si une décision est raisonnable. Ces éléments ne doivent pas servir de liste de vérification; leur importance peut varier selon le contexte et ils interagissent forcément entre eux.

En conséquence, il se peut que la cour de révision estime qu'une décision est déraisonnable au regard de ces considérations contextuelles. Comme les décideurs administratifs tiennent leurs pouvoirs d'une loi, le régime législatif applicable est probablement l'aspect le plus important du contexte juridique d'une décision donnée. L'application appropriée de la norme de la décision raisonnable permet de dissiper la crainte que le décideur administratif puisse interpréter la portée de sa propre compétence de manière à étendre ses pouvoirs au-delà de ce que voulait le législateur. La question de savoir si une interprétation est justifiée dépendra du contexte, notamment des mots choisis par le législateur pour décrire les limites et les contours du pouvoir du décideur.

Le droit — tant la loi que la common law — limitera lui aussi l'éventail des options qui s'offrent légalement au décideur administratif chargé de trancher un cas particulier. Tout précédent sur la question soumise au décideur administratif ou sur une question semblable, ainsi que le droit international dans certains domaines du processus décisionnel administratif, aura pour effet de circonscrire l'éventail des issues raisonnables. La question de savoir si le décideur administratif a agi raisonnablement en adaptant une règle de droit ou d'equity appelle un examen fondé dans une très large mesure sur le contexte.

Les questions d'interprétation de la loi ne reçoivent pas un traitement exceptionnel. Comme toute autre question de droit, on peut les évaluer en appliquant la norme de la décision raisonnable. S'il s'agit de la norme applicable, la cour de révision ne procède pas à une analyse *de novo* de la question soulevée ni ne se demande ce qu'aurait été la décision correcte. Mais une méthode de contrôle selon la norme de la décision raisonnable qui respecte l'intention du législateur doit tenir pour acquis que les instances chargées d'interpréter la loi — qu'il s'agisse des cours de justice ou des décideurs administratifs — effectueront cet exercice conformément au principe moderne en matière d'interprétation des lois. Les décideurs administratifs ne sont pas tenus dans tous les cas de procéder à une interprétation formaliste de la loi. Or, quelle que soit la forme que prend l'opération d'interprétation d'une disposition législative, le fond de l'interprétation de celle-ci par le décideur administratif doit être conforme à son texte, à son contexte et à son objet.

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Furthermore, the decision maker must take the evidentiary record and the general factual matrix that bears on its decision into account, and its decision must be reasonable in light of them. The reasonableness of a decision may be jeopardized where the decision maker has fundamentally misapprehended or failed to account for the evidence before it. The reasons must also meaningfully account for the central issues and concerns raised by the parties, even though reviewing courts cannot expect administrative decision makers to respond to every argument or line of possible analysis.

While administrative decision makers are not bound by their previous decisions, they must be concerned with the general consistency of administrative decisions. Therefore, whether a particular decision is consistent with the administrative body's past decisions is also a constraint that the reviewing court should consider when determining whether an administrative decision is reasonable. Finally, individuals are entitled to greater procedural protection when the decision in question involves the potential for significant personal impact or harm. Where the impact of a decision on an individual's rights and interests is severe, the reasons provided to that individual must reflect the stakes. The principle of responsive justification means that if a decision has particularly harsh consequences for the affected individual, the decision maker must explain why its decision best reflects the legislature's intention.

The question of the appropriate remedy — specifically, whether a court that quashes an unreasonable decision should exercise its discretion to remit the matter to the decision maker for reconsideration with the benefit of the court's reasons — is multi-faceted. The choice of remedy must be guided by the rationale for applying the reasonableness standard to begin with, including the recognition by the reviewing court that the legislature has entrusted the matter to the administrative decision maker, and not to the court, concerns related to the proper administration of the justice system, the need to ensure access to justice and the goal of expedient and cost-efficient decision making. Giving effect to these principles in the remedial context means that where a decision reviewed by applying the reasonableness standard cannot be upheld, it will most often be appropriate to remit the matter to the decision maker for reconsideration with the benefit of the court's reasons. However, there are limited scenarios in which remitting the matter would stymie the timely and effective resolution of matters in a manner that no legislature could have intended. An intention that the administrative

Qui plus est, le décideur doit prendre en considération la preuve versée au dossier et la trame factuelle générale qui a une incidence sur sa décision et celle-ci doit être raisonnable au regard de ces éléments. Le caractère raisonnable d'une décision peut être compromis si le décideur s'est fondamentalement mépris sur la preuve qui lui a été soumise ou n'en a pas tenu compte. Les motifs doivent aussi tenir valablement compte des questions et préoccupations centrales soulevées par les parties, même si les cours de révision ne peuvent s'attendre à ce que les décideurs administratifs répondent à tous les arguments ou modes possibles d'analyse.

Bien que les décideurs administratifs ne soient pas liés par leurs décisions antérieures, ils doivent se soucier de l'uniformité générale des décisions administratives. La question de savoir si une décision en particulier est conforme à la jurisprudence de l'organisme administratif est donc elle aussi une contrainte dont devrait tenir compte la cour de révision au moment de décider si cette décision est raisonnable. Enfin, les individus ont droit à une plus grande protection procédurale lorsque la décision sous examen est susceptible d'avoir des répercussions personnelles importantes ou de leur causer un grave préjudice. Lorsque la décision a des répercussions sévères sur les droits et intérêts de l'individu visé, les motifs fournis à ce dernier doivent refléter ces enjeux. Le principe de la justification adaptée aux questions et préoccupations soulevées veut que, si les conséquences sont particulièrement graves pour l'individu concerné, le décideur explique pourquoi sa décision reflète le mieux l'intention du législateur.

La question de la réparation qu'il convient d'accorder — en l'occurrence celle de savoir si la cour qui casse une décision déraisonnable devrait exercer son pouvoir discrétionnaire de renvoyer l'affaire pour réexamen à la lumière des motifs donnés par la cour — revêt de multiples facettes. Le choix de la réparation doit être guidé par la raison d'être de l'application de cette norme, y compris le fait pour la cour de révision de reconnaître que le législateur a confié le règlement de l'affaire à un décideur administratif, et non à une cour, les préoccupations liées à la bonne administration du système de justice, à la nécessité d'assurer l'accès à la justice et à la volonté de mettre sur pied un processus décisionnel à la fois rapide et économique. Donner effet à ces principes dans le contexte de la réparation signifie que, lorsque la décision contrôlée selon la norme de la décision raisonnable ne peut être confirmée, il conviendra le plus souvent de renvoyer l'affaire au décideur pour réexamen à la lumière des motifs donnés par la cour. Cependant, il y a des situations limitées dans lesquelles le renvoi de l'affaire pour nouvel examen fait échec au souci de résolution rapide et efficace d'une

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decision maker decide the matter at first instance cannot give rise to endless judicial reviews and subsequent reconsiderations. Declining to remit a matter to the decision maker may be appropriate where it becomes evident that a particular outcome is inevitable and that remitting the case would therefore serve no useful purpose. Elements like concern for delay, fairness to the parties, urgency of providing a resolution to the dispute, the nature of the particular regulatory regime, whether the administrative decision maker had a genuine opportunity to weigh in on the issue in question, costs to the parties, and efficient use of public resources may also influence the exercise of a court's discretion to remit the matter.

In the case at bar, there is no basis for departing from the presumption of reasonableness review. The Registrar's decision has come before the courts by way of judicial review, not by way of a statutory appeal. Given that Parliament has not prescribed the standard to be applied, there is no indication that the legislature intended a standard of review other than reasonableness. The Registrar's decision does not give rise to any constitutional questions, general questions of law of central importance to the legal system as a whole or questions regarding the jurisdictional boundaries between administrative bodies. As a result, the standard to be applied in reviewing the Registrar's decision is reasonableness.

The Registrar's decision was unreasonable. She failed to justify her interpretation of s. 3(2)(a) in light of the constraints imposed by s. 3 considered as a whole, by international treaties that inform its purpose, by the jurisprudence on the interpretation of s. 3(2)(a), and by the potential consequences of her interpretation. Each of these elements — viewed individually and cumulatively — strongly supports the conclusion that s. 3(2)(a) was not intended to apply to children of foreign government representatives or employees who have not been granted diplomatic privileges and immunities. Though V had raised many of these considerations, the Registrar failed to address those submissions in her reasons and did not do more than conduct a cursory review of the legislative history of s. 3(2)(a) and conclude that her interpretation was not explicitly precluded by its text.

First, the Registrar failed to address the immediate statutory context of s. 3(2)(a), which provides clear support

manière telle qu'aucune législature n'aurait pu souhaiter. L'intention que le décideur administratif tranche l'affaire en première instance ne saurait donner lieu à un va-et-vient interminable de contrôles judiciaires et de nouveaux examens. Le refus de renvoyer l'affaire au décideur peut s'avérer indiqué lorsqu'il devient évident qu'un résultat donné est inévitable, si bien que le renvoi de l'affaire ne servirait à rien. Les préoccupations concernant les délais, l'équité envers les parties, le besoin urgent de régler le différend, la nature du régime de réglementation donné, la possibilité réelle ou non pour le décideur administratif de se pencher sur la question en litige, les coûts pour les parties et l'utilisation efficace des ressources publiques peuvent aussi influer sur l'exercice par la cour de son pouvoir discrétionnaire de renvoyer l'affaire.

Rien ne permet de s'écarter de la présomption de contrôle selon la norme de la décision raisonnable en l'espèce. La décision de la greffière a été soumise aux cours de justice par voie de contrôle judiciaire et non par voie d'appel prévu par la loi. Étant donné que le Parlement n'a pas prescrit la norme à appliquer, rien n'indique que le législateur voulait qu'une autre norme que celle de la décision raisonnable soit appliquée. La décision de la greffière ne soulève pas de questions constitutionnelles, de questions de droit générales d'importance capitale pour le système juridique dans son ensemble ou de questions liées aux délimitations des compétences respectives d'organismes administratifs. En conséquence, la décision de la greffière doit être examinée selon la norme de la décision raisonnable.

La décision de la greffière est déraisonnable. Elle n'a pas justifié son interprétation de l'al. 3(2)a) à la lumière des contraintes qu'imposent l'art. 3 pris dans son ensemble, les traités internationaux qui éclairent l'objet de cette disposition, la jurisprudence relative à l'interprétation de l'al. 3(2)a), et les conséquences possibles de son interprétation. Chacun de ces éléments — pris individuellement ainsi que dans leur ensemble — appuie fortement la conclusion selon laquelle l'al. 3(2)a) n'est pas censé s'appliquer aux enfants de représentants ou d'employés au service d'un gouvernement étranger à qui on n'avait pas accordé de privilèges et d'immunités diplomatiques. Bien que V ait soulevé bon nombre de ces considérations, la greffière n'a pas traité de ces arguments dans ses motifs et n'a pas fait davantage que se livrer à un examen superficiel de l'historique législatif de l'al. 3(2)a) et conclure que le libellé de celui-ci n'excluait pas explicitement son interprétation.

En premier lieu, la greffière n'a pas examiné le contexte législatif qui entoure l'al. 3(2)a), lequel étaye clairement la

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for the conclusion that all of the persons contemplated by s. 3(2)(a) must have been granted diplomatic privileges and immunities in some form for the exception to apply. Second, the Registrar disregarded compelling submissions that s. 3(2) is a narrow exception consistent with established principles of international law and with the leading international treaties that extend diplomatic privileges and immunities to employees and representatives of foreign governments. Third, it was a significant omission to ignore the relevant cases that were before the Registrar which suggest that s. 3(2)(a) was intended to apply only to those individuals whose parents have been granted diplomatic privileges and immunities. Finally, there is no evidence that the Registrar considered the potential consequences of expanding her interpretation of s. 3(2)(a) to include all individuals who have not been granted diplomatic privileges and immunities. Rules concerning citizenship require a high degree of interpretive consistency in order to shield against arbitrariness. The Registrar's interpretation cannot be limited to the children of spies — its logic would be equally applicable to other scenarios. As well, provisions such as s. 3(2)(a) must be given a narrow interpretation because they potentially take away rights which otherwise benefit from a liberal and broad interpretation. Yet there is no indication that the Registrar considered the potential harsh consequences of her interpretation, or whether, in light of those potential consequences, Parliament would have intended s. 3(2)(a) to apply in this manner. Although the Registrar knew her interpretation was novel, she failed to provide a rationale for her expanded interpretation.

It was therefore unreasonable for the Registrar to find that s. 3(2)(a) can apply to individuals whose parents have not been granted diplomatic privileges and immunities in Canada. It is undisputed that V's parents had not been granted such privileges and immunities. No purpose would therefore be served by remitting this matter to the Registrar. Given that V was born in Canada, his status is governed only by the general rule of citizenship by birth. He is a Canadian citizen.

Per Abella and Karakatsanis JJ.: There is agreement with the majority that the appeal should be dismissed. The Registrar's decision to cancel V's citizenship certificate was unreasonable and was properly quashed by the Court of Appeal.

conclusion selon laquelle toutes les personnes visées par l'al. 3(2)a) doivent s'être vu accorder certains privilèges et immunités diplomatiques pour que l'exception trouve application. En deuxième lieu, la greffière a fait fi des observations convaincantes voulant que la raison d'être du par. 3(2) consiste à instituer une exception étroite conformément aux principes établis du droit international et aux traités internationaux d'importance en vertu desquels les employés et représentants au service d'un gouvernement étranger bénéficient de privilèges et immunités diplomatiques. En troisième lieu, il s'agissait d'une omission importante que d'ignorer les décisions pertinentes portées à la connaissance de la greffière qui tendent à indiquer que l'al. 3(2)a) n'est censé s'appliquer qu'aux personnes dont les parents se sont vu accorder des privilèges et immunités diplomatiques. En dernier lieu, rien n'établit que la greffière a tenu compte des conséquences que peut avoir le fait d'étendre son interprétation de l'al. 3(2)a) à l'ensemble des personnes à qui on n'a pas accordé de privilèges et d'immunités diplomatiques. Les règles concernant la citoyenneté commandent une grande uniformité en matière d'interprétation pour se prémunir contre la perception d'arbitraire. L'interprétation de la greffière ne saurait se limiter aux enfants d'espions; sa logique vaudrait tout autant dans d'autres cas. En outre, il faut donner aux dispositions telles que l'al. 3(2)a) une interprétation étroite puisqu'elles refusent ou risquent d'enlever des droits qui autrement recevraient une interprétation large et libérale. Néanmoins, rien n'indique que la greffière a pris en compte les possibles conséquences sévères de son interprétation ou que, compte tenu de ces conséquences éventuelles, elle s'est demandée si le Parlement aurait voulu que l'al. 3(2)a) s'applique de cette manière. Même si la greffière était au fait du caractère inédit de son interprétation, elle n'a pas motivé cette interprétation élargie.

Il était donc déraisonnable de la part de la greffière de décider que l'al. 3(2)a) peut s'appliquer aux personnes dont les parents ne se sont pas vu accorder de privilèges et immunités diplomatiques au Canada. Nul ne conteste que les parents de V ne s'étaient pas vu accorder pareils privilèges et immunités. En conséquence, il ne servirait à rien de renvoyer l'affaire à la greffière. En tant que personne née au Canada, V dispose d'un statut régi uniquement par la règle générale de la citoyenneté de naissance. Il est citoyen canadien.

Les juges Abella et Karakatsanis : Il y a accord avec les juges majoritaires pour rejeter le pourvoi. La décision de la greffière d'annuler le certificat de citoyenneté de V était déraisonnable et la Cour d'appel a eu raison de la casser.

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There is also agreement with the majority that there should be a presumption of reasonableness in judicial review. The contextual factors analysis should be eliminated from the standard of review framework, and "true questions of jurisdiction" should be abolished as a separate category of issues subject to correctness review. However, the elimination of these elements does not support the foundational changes to judicial review outlined in the majority's framework that result in expanded correctness review. Rather than confirming a meaningful presumption of deference for administrative decision-makers, the majority strips away deference from hundreds of administrative actors, based on a formalistic approach that ignores the legislature's intention to leave certain legal and policy questions to administrative decision-makers. The majority's presumption of reasonableness review rests on a totally new understanding of legislative intent and the rule of law and prohibits any consideration of well-established foundations for deference. By dramatically expanding the circumstances in which generalist judges will be entitled to substitute their own views for those of specialized decision-makers who apply their mandates on a daily basis, the majority's framework fundamentally reorients the relationship between administrative actors and the judiciary, thus advocating a profoundly different philosophy of administrative law.

The majority's framework rests on a flawed and incomplete conceptual account of judicial review, one that unjustifiably ignores the specialized expertise of administrative decision-makers and reads out the foundations of the modern understanding of legislative intent. Instead of understanding legislative intent as being the intention to leave legal questions within their mandate to specialized decision-makers with expertise, the majority removes expertise from the equation entirely. In so doing, the majority disregards the historically accepted reason why the legislature intended to delegate authority to an administrative actor. In particular, such an approach ignores the possibility that specialization and expertise are embedded into this legislative choice. Post-*Dunsmuir*, the Court has been steadfast in confirming the central role of specialization and expertise, affirming their connection to legislative intent, and recognizing that they give administrative decision-makers the interpretative upper hand on questions of law. Specialized expertise has become the core

Il y a également accord avec la majorité pour dire qu'il doit y avoir présomption d'application de la norme de la décision raisonnable en cas de contrôle judiciaire. L'analyse contextuelle doit être éliminée du cadre d'analyse applicable à la norme de contrôle, et la catégorie des « questions touchant vraiment à la compétence » doit être abolie en tant que catégorie distincte de questions assujetties à la norme de la décision correcte. Toutefois, l'élimination de ces éléments ne justifie pas les modifications fondamentales apportées au contrôle judiciaire qui sont décrites dans le cadre proposé par la majorité et qui entraînent un élargissement du contrôle judiciaire fondé sur la norme de la décision correcte. Au lieu de confirmer l'existence d'une présomption significative de déférence en faveur des décideurs administratifs, la majorité prive de déférence des centaines d'acteurs administratifs, en appliquant une approche formaliste qui néglige la volonté du législateur de laisser à des décideurs administratifs le soin de trancher certaines questions de droit et de politique. La présomption d'application de la norme de la décision raisonnable qu'énonce la majorité repose sur une compréhension totalement nouvelle de l'intention du législateur et de la primauté du droit et interdit toute prise en compte des postulats bien établis du principe de la déférence. En élargissant considérablement les circonstances dans lesquelles les juges généralistes pourront substituer leur propre opinion à celle des décideurs spécialisés qui exercent leur mandat au quotidien, le cadre proposé par la majorité réoriente complètement le rapport entre les acteurs administratifs et la magistrature, et préconise du même coup une philosophie du droit administratif profondément différente.

Le cadre établi par la majorité repose sur une conception du contrôle judiciaire qui est à la fois erronée et incomplète et qui néglige sans raison valable l'expertise spécialisée des décideurs administratifs et fait fi des fondements de la conception moderne de l'intention du législateur. Au lieu de considérer que la volonté du législateur est de confier à des décideurs spécialisés possédant une expertise en la matière le soin de trancher les questions de droit relevant de leur mandat, la majorité fait table rase de l'expertise de ces décideurs. Ce faisant, la majorité ne tient pas compte de la raison historiquement reconnue pour laquelle le législateur souhaitait déléguer des pouvoirs à des acteurs administratifs. En particulier, cette approche ne tient pas compte de la possibilité que la spécialisation et l'expertise fassent partie intégrante de ce choix du législateur. Depuis l'arrêt *Dunsmuir*, la Cour n'a cessé de confirmer le rôle central que jouent la spécialisation et l'expertise, de confirmer le lien entre celles-ci et l'intention du législateur et de reconnaître

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rationale for deference. Giving proper effect to the legislature's choice to delegate authority to an administrative decision-maker requires understanding the advantages that the decision-maker may enjoy in exercising its mandate. Chief among those advantages are the institutional expertise and specialization inherent to administering a particular mandate on a daily basis. In interpreting their enabling statutes, administrative actors may have a particularly astute appreciation for the on-the-ground consequences of particular legal interpretations, of statutory context, of the purposes that a provision or legislative scheme are meant to serve, and of specialized terminology. The advantages stemming from specialization and expertise provide a robust foundation for deference. The majority's approach accords no weight to such institutional advantages and banishes expertise from the standard of review analysis entirely. The removal of the current conceptual basis for deference opens the gates to expanded correctness review.

In the majority's framework, deference gives way whenever the rule of law demands it. This approach, however, flows from a court-centric conception of the rule of law. The rule of law means that administrative decision-makers make legal determinations within their mandate; it does not mean that only judges decide questions of law with an unrestricted license to substitute their opinions for those of administrative actors through correctness review. The majority's approach not only erodes the presumption of deference; it erodes confidence in the fact that law-making and legal interpretation are shared enterprises between courts and administrative decision-makers. Moreover, access to justice is at the heart of the legislative choice to establish a robust system of administrative law. This goal is compromised when a narrow conception of the rule of law is invoked to impose judicial hegemony over administrative decision-makers, which adds unnecessary expense and complexity. Authorizing more incursions into the administrative system by judges and permitting *de novo* review of every legal decision adds to the delay and cost of obtaining a final decision.

The majority's reformulation of "legislative intent" invites courts to apply an irrebuttable presumption of correctness review whenever an administrative scheme

qu'elles confèrent aux décideurs administratifs un privilège en matière d'interprétation sur les questions de droit. L'expertise spécialisée est devenue la principale raison invoquée pour justifier la déférence. Pour donner l'effet voulu à la volonté du législateur de déléguer des pouvoirs aux décideurs administratifs, il faut comprendre les avantages que peut comporter l'exercice, par ces décideurs, de leur mandat. Parmi ces avantages se trouvent, au premier chef, l'expertise institutionnelle et la spécialisation inhérentes à l'exécution quotidienne d'un mandat particulier. Lorsqu'ils interprètent leur loi habilitante, les acteurs administratifs sont particulièrement bien placés pour saisir avec justesse les conséquences concrètes d'interprétations juridiques particulières, le contexte législatif, les objectifs qu'une disposition ou un régime législatifs sont censés viser et la terminologie spécialisée. Les avantages conférés par la spécialisation et l'expertise constituent une raison convaincante de faire preuve de déférence. L'approche préconisée par la majorité n'accorde aucun poids à de tels avantages institutionnels et évacue totalement l'expertise de l'analyse relative à la norme de contrôle. La suppression du fondement conceptuel qui justifie actuellement la déférence ouvre les portes à un contrôle judiciaire élargi fondé sur la norme de la décision correcte.

Selon le cadre proposé par la majorité, la déférence est éclipsée chaque fois que la primauté du droit l'exige. Cette approche découle toutefois d'une conception judiciarisée de la primauté du droit. La primauté du droit signifie que les décideurs administratifs prennent des décisions juridiques dans le cadre de leur mandat; elle ne signifie pas que seuls les juges peuvent trancher des questions de droit et ont carte blanche pour substituer leur opinion à celle des acteurs administratifs par le biais d'un contrôle selon la norme de la décision correcte. L'approche de la majorité à la fois affaiblit la présomption de déférence, et mine la confiance dans le fait que l'élaboration et l'interprétation du droit relèvent de la participation commune des tribunaux judiciaires et des décideurs administratifs. De plus, l'accès à la justice est au cœur du choix du législateur d'instaurer un système de droit administratif solide. Cet objectif est compromis lorsqu'on invoque une conception étroite de la primauté du droit pour imposer l'hégémonie judiciaire aux décideurs administratifs, ce qui augmente inutilement les coûts et la complexité. Permettre aux juges de s'immiscer encore plus dans la justice administrative et permettre un examen *de novo* de chaque décision juridique allonge les délais et augmente les frais engagés pour obtenir une décision définitive.

La reformulation de la notion de « l'intention du législateur » proposée par la majorité invite les cours à appliquer une présomption irréfragable d'application de la

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includes a right of appeal. Elevating appeal clauses to indicators of correctness review creates a two-tier system that defers to the expertise of administrative decision-makers only where there is no appeal clause. Yet appeal rights do not represent a different institutional structure that requires a more searching form of review. The mere fact that a statute contemplates an appeal says nothing about the degree of deference required in the review process. The majority's position hinges almost entirely on a textualist argument — i.e., that the presence of the word "appeal" indicates a legislative intent that courts apply the same standards of review found in civil appellate jurisprudence. This disregards long-accepted institutional distinctions between courts and administrative decision-makers. The continued use by legislatures of the term "appeal" cannot be imbued with the intent that the majority ascribes to it. The idea that appellate standards of review must be applied to every right of appeal is entirely unsupported by the jurisprudence. For at least 25 years, the Court has not treated statutory rights of appeal as a determinative reflection of legislative intent, and such clauses have played little or no role in the standard of review analysis. Moreover, pre-*Dunsmuir*, statutory rights of appeal were still seen as only one factor and not as unequivocal indicators of correctness review. Absent exceptional circumstances, a statutory right of appeal does not displace the presumption of reasonableness.

The majority's disregard for precedent and *stare decisis* has the potential to undermine both the integrity of the Court's decisions, and public confidence in the stability of the law. *Stare decisis* places significant limits on the Court's ability to overturn its precedents. The doctrine promotes the predictable and consistent development of legal principles, fosters reliance on judicial decisions, and contributes to the integrity of the judicial process. Respect for precedent also safeguards the Court's institutional legitimacy. The precedential value of a judgment does not expire with the tenure of the panel of judges that decided it. When the Court does choose to overrule its own precedents, it should do so carefully, with moderation, and with due regard for all the important considerations

norme de la décision correcte lorsqu'un régime administratif prévoit un droit d'appel. En élevant des dispositions créant un droit d'appel au rang d'indicateurs d'un contrôle assujetti à la norme de la décision correcte, on crée un système de droit administratif à deux vitesses dans lequel les juges s'en remettent à l'expertise des décideurs administratifs seulement lorsqu'il n'existe pas de disposition d'appel. Cependant, l'existence de droits d'appel ne crée pas un régime institutionnel différent qui commanderait un contrôle plus fouillé. Le simple fait qu'une loi envisage la possibilité d'un appel ne permet pas de tirer de conclusions quant au degré de déférence requis lors du contrôle en question. La position de la majorité repose presque exclusivement sur un argument textuel suivant lequel la présence du mot « appel » indique que le législateur voulait que les cours de révision appliquent les mêmes normes de contrôle que celles que les cours d'appel appliquent dans leurs arrêts en matière civile. Cela néglige les distinctions institutionnelles qui sont reconnues depuis longtemps entre les tribunaux judiciaires et les décideurs administratifs. L'emploi systématique du terme « appel » par les législatures ne saurait s'expliquer par l'intention que la majorité lui prête. L'idée selon laquelle il faut appliquer les normes de contrôle d'appel à tous les droits d'appel ne trouve aucun appui dans la jurisprudence. Depuis au moins 25 ans, la Cour ne considère pas les droits d'appel accordés par une loi comme une expression déterminante de l'intention du législateur, et de telles dispositions ne sont presque pas ou pas du tout entrées en ligne de compte dans l'analyse relative à la norme de contrôle. De surcroît, avant l'arrêt *Dunsmuir*, les droits d'appel conférés par la loi n'étaient encore perçus que comme un facteur parmi d'autres et non comme des indices sans équivoque d'un contrôle selon la norme de la décision correcte. Sauf en présence de circonstances exceptionnelles, un droit d'appel conféré par la loi n'écarte pas la présomption d'application de la norme de la décision raisonnable.

Le mépris de la majorité pour les précédents et la règle du *stare decisis* risque de compromettre l'intégrité des décisions de la Cour et d'ébranler la confiance du public à l'égard de la stabilité du droit. La règle du *stare decisis* limite considérablement la capacité de la Cour d'infirmer ses propres précédents. La doctrine favorise le développement prévisible et cohérent des principes de droit, favorise la confiance envers les décisions judiciaires et contribue à l'intégrité du processus judiciaire. Le respect des précédents préserve également la légitimité institutionnelle de la Cour. Les décisions de la Cour ne perdent pas leur valeur de précédent avec le départ des juges qui y ont participé. Lorsque la Cour choisit d'écarter ses propres précédents, elle doit le faire avec prudence et modération

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that undergird the doctrine of *stare decisis*. A nuanced balance must be struck between maintaining the stability of the common law and ensuring that the law is flexible and responsive enough to adapt to new circumstances and societal norms. *Stare decisis* plays a critical role in maintaining that balance and upholding the rule of law.

There is no principled justification for departing from the existing jurisprudence and abandoning the Court's long-standing view of how statutory appeal clauses impact the standard of review analysis. In doing so, the majority disregards the high threshold required to overturn the Court's decisions. The unprecedented wholesale rejection of an entire body of jurisprudence is particularly unsettling. The affected cases are numerous and include many decisions conducting deferential review even in the face of a statutory right of appeal and bedrock judgments affirming the relevance of administrative expertise to the standard of review analysis. Overruling these judgments flouts *stare decisis*, which prohibits courts from overturning past decisions that simply represent a choice with which the current bench does not agree. The majority's approach also has the potential to disturb settled interpretations of many statutes that contain a right of appeal; every existing interpretation of such statutes that has been affirmed under a reasonableness standard will be open to fresh challenge. Moreover, if the Court, in its past decisions, misconstrued the purpose of statutory appeal clauses, legislatures were free to clarify this interpretation through legislative amendment. In the absence of legislative correction, the case for overturning decisions is even less compelling.

The Court should offer additional direction on reasonableness review so that judges can provide careful and meaningful oversight of the administrative justice system while respecting its legitimacy and the perspectives of its front-line, specialized decision-makers. However, rather than clarifying the role of reasons and how to review them, the majority revives the kind of search for errors that dominated the Court's prior jurisprudence. The majority's multi-factored, open-ended list of constraints on administrative decision making will encourage reviewing courts to dissect administrative reasons in a line-by-line hunt for error. These constraints may function in practice as a wide-ranging catalogue of hypothetical errors to justify

et en tenant dûment compte de toutes les considérations importantes qui sous-tendent la doctrine du *stare decisis*. On doit trouver un équilibre subtil entre le maintien de la stabilité de la common law et l'assurance que le droit est suffisamment souple et réceptif pour s'adapter à de nouvelles réalités et à l'évolution des normes sociales. La règle du *stare decisis* joue un rôle essentiel pour maintenir cet équilibre et assurer le respect de la primauté du droit.

Il n'existe aucune raison logique justifiant de rompre avec la jurisprudence existante et d'abandonner la conception bien établie de la Cour quant à l'effet des dispositions législatives créant un droit d'appel sur l'analyse de la norme de contrôle. Ce faisant, la majorité ne tient pas compte du critère rigoureux auquel il faut satisfaire pour pouvoir écarter l'une des décisions de la Cour. Le rejet en bloc sans précédent de tout un arsenal jurisprudentiel est particulièrement troublant. Les arrêts touchés sont nombreux et comprennent maintes décisions rendues aux termes d'un contrôle fondé sur la déférence en dépit de l'existence d'un droit d'appel conféré par la loi ainsi que des arrêts fondamentaux confirmant la pertinence de l'expertise administrative pour l'analyse de la norme de contrôle. L'abandon de ces jugements bafoue la règle du *stare decisis* qui interdit aux tribunaux d'écarter des décisions antérieures qui représentent simplement une solution à laquelle la formation actuelle ne souscrit pas. L'approche de la majorité risque également de bousculer les interprétations établies de nombreuses lois prévoyant un droit d'appel; chaque interprétation existante de ces lois qui a été confirmée en appliquant la norme de contrôle de la décision raisonnable sera susceptible d'être remise en question. Par ailleurs, si la Cour s'était, dans ses décisions antérieures, méprise sur l'objet des dispositions d'appel prévues par la loi, il aurait alors été loisible aux législateurs de clarifier cette interprétation au moyen d'une modification législative. En l'absence d'intervention du législateur, les arguments militant en faveur du renversement des décisions antérieures sont encore moins convaincants.

La Cour devrait fournir des balises supplémentaires quant à la façon de procéder à un contrôle judiciaire fondé sur la norme de la décision raisonnable afin que les juges puissent assurer une surveillance minutieuse et concrète du système de justice administrative tout en respectant la légitimité de celui-ci et le point de vue des décideurs spécialisés de première ligne. Toutefois, plutôt que de clarifier le rôle que jouent les motifs et de préciser comment on doit les contrôler, la majorité ressuscite la démarche axée sur la recherche d'erreurs qui occupait une place prépondérante dans l'ancienne jurisprudence de la Cour. La liste multifactorielle et non limitative des contraintes à la prise de décisions administratives dressée par la majorité incitera

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quashing an administrative decision. Structuring reasonableness review in this fashion effectively imposes on administrative decision-makers a higher standard of justification than on trial judges. Such an approach undercuts deference. Reasonableness review should instead focus on the concept of deference to administrative decision-makers and to the legislative intention to confide in them a mandate. Curial deference is the hallmark of reasonableness review, setting it apart from the substitution of opinion permitted under correctness.

Deference imposes three requirements on courts conducting reasonableness review. First, deference is the attitude a reviewing court must adopt towards an administrative decision-maker. Deference mandates respect for the legislative choice to entrust a decision to administrative actors rather than to the courts, for the important role that administrative decision-makers play, and for their specialized expertise and the institutional setting in which they operate. Reviewing courts must pay respectful attention to the reasons offered for an administrative decision, make a genuine effort to understand why the decision was made, and give the decision a fair and generous construction. Second, deference affects how a court frames the question it must answer and the nature of its analysis. A reviewing court does not ask how it would have resolved an issue, but rather whether the answer provided by the decision-maker was unreasonable. Ultimately, whether an administrative decision is reasonable depends on the context, and a reviewing court must be attentive to all relevant circumstances, including the reasons offered to support the decision, the record, the statutory scheme and the particular issues raised, among other factors. Third, deferential review impacts how a reviewing court evaluates challenges to a decision. The party seeking judicial review bears the onus of showing that the decision was unreasonable; the decision-maker does not have to persuade the court that its decision is reasonable.

les cours de révision à disséquer les motifs administratifs et à se lancer dans une chasse au trésor, phrase par phrase, à la recherche d'une erreur. En pratique, ces contraintes risquent de se transformer en un vaste catalogue d'erreurs hypothétiques qui peuvent servir à justifier l'annulation d'une décision administrative. Cette façon de structurer le contrôle selon la norme de la décision raisonnable astreint effectivement les décideurs administratifs à une norme de justification plus exigeante que celle qui s'applique aux juges de première instance. Cette approche sape la déférence. Le contrôle judiciaire selon la norme de la décision raisonnable devrait plutôt être centré sur le principe de la déférence à l'égard des décideurs administratifs et de l'intention du législateur de leur confier un mandat. La retenue judiciaire est la marque distinctive du contrôle selon la norme de la décision raisonnable et ce qui le distingue de la norme de la décision correcte, laquelle permet à la cour de substituer son opinion à celle du décideur administratif.

Le principe de la déférence soumet à trois exigences les tribunaux qui procèdent à un contrôle selon la norme de la décision raisonnable. D'abord, la déférence est l'attitude que la cour de révision doit adopter à l'égard du décideur administratif. Le principe de la déférence commande le respect du choix du législateur de confier à des acteurs administratifs plutôt qu'aux cours de justice le soin de rendre certaines décisions et la reconnaissance du rôle important que jouent les décideurs administratifs, ainsi que de leur expertise spécialisée et du cadre institutionnel dans lequel ils évoluent. Les cours de révision doivent également accorder une attention respectueuse aux motifs donnés à l'appui d'une décision administrative, s'efforcer sincèrement de comprendre la décision et interpréter la décision de façon équitable et généreuse. En deuxième lieu, le principe de la déférence influe sur la façon dont un tribunal formule la question à laquelle il doit répondre et la nature de l'analyse qu'il mènera. La cour de révision ne cherche pas à savoir comment elle aurait résolu la question, mais plutôt si la réponse donnée par le décideur administratif était déraisonnable. En fin de compte, la question de savoir si une décision administrative est raisonnable dépend du contexte, et la cour de révision doit tenir compte de toutes les circonstances pertinentes, y compris les motifs invoqués au soutien de la décision, le dossier, le régime législatif et les questions particulières soulevées par le demandeur, parmi d'autres facteurs. Troisièmement, le contrôle fondé sur le principe de la déférence influence la façon dont la cour de révision évalue la contestation dont fait l'objet la décision. Il incombe à la partie réclamant le contrôle judiciaire de démontrer que la décision en cause est déraisonnable; le décideur n'a pas à convaincre la cour de justice que sa décision est raisonnable.

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The administrative decision itself is the focal point of the review exercise. In all cases, the question remains whether the challenging party has demonstrated that a decision is unreasonable. Where reasons are neither required nor available, reasonableness may be justified by past decisions of the administrative body or in light of the procedural context. Where reasons are provided, they serve as the natural starting point to determine whether the decision-maker acted reasonably. By beginning with the reasons, read in light of the surrounding context and the grounds raised, reviewing courts provide meaningful oversight while respecting the legitimacy of specialized administrative decision making. Reviewing courts should approach the reasons with respect for the specialized decision-makers, their significant role and the institutional context chosen by the legislator. Reviewing courts should not second-guess operational implications, practical challenges and on-the-ground knowledge and must remain alert to specialized concepts or language. Further, a reviewing court is not restricted to the four corners of the written reasons and should, if faced with a gap in the reasons, look to other materials to see if they shed light on the decision, including: the record of any formal proceedings and the materials before the decision-maker, past decisions of the administrative body, and policies or guidelines developed to guide the type of decision under review. These materials may assist a court in understanding the outcome. In these ways, reviewing courts may legitimately supplement written reasons without supplanting the analysis. Reasons must be read together with the outcome to determine whether the result falls within a range of possible outcomes. This approach puts substance over form where the basis for a decision is evident on the record, but not clearly expressed in written reasons.

As well, a court conducting deferential review must view claims of error in context and with caution, cognizant of the need to avoid substituting its opinion for that of those empowered and better equipped to answer the questions at issue. Because judicial substitution is incompatible with deference, reviewing courts must carefully evaluate the challenges raised to ensure they go to the reasonableness of the decision rather than representing a

La décision administrative est en soi le point de mire du contrôle judiciaire. Dans tous les cas, la question à trancher demeure celle de savoir si la partie qui conteste la décision a démontré que celle-ci est déraisonnable. Lorsque le décideur n'est pas tenu de motiver sa décision ou qu'il est impossible d'obtenir les motifs de la décision, le caractère raisonnable de la décision peut être démontré à l'aide de décisions antérieures de l'organisme administratif ou à la lumière du contexte procédural. Pour déterminer si le décideur a agi raisonnablement, la cour de révision doit d'abord, cela va de soi, examiner les motifs, s'il en est, qui ont été exposés. En se penchant d'abord sur les motifs de la décision, à la lumière du contexte qui l'entoure et des arguments invoqués pour la contester, la cour de révision procède à un véritable contrôle tout en respectant la légitimité du processus décisionnel des autorités administratives spécialisées. Les cours de révision devraient aborder les motifs dans un esprit de respect envers les décideurs spécialisés, le rôle important qui leur a été confié et le contexte institutionnel choisi par le législateur. Elles devraient se garder de reconsidérer les incidences concrètes, les difficultés d'ordre pratique de même que les connaissances de terrain, et demeurer attentives aux concepts ou termes spécialisés. De plus, l'examen qu'effectue la cour de révision ne se limite pas à la teneur même des motifs écrits de la décision; lorsqu'elle constate l'existence d'une lacune dans les motifs, la cour doit examiner d'autres documents pour savoir s'ils permettent de mieux comprendre la décision, y compris : le dossier des actes de procédure officiels, les documents portés à l'attention du décideur, les décisions antérieures de l'organisme administratif, ainsi que les politiques ou lignes directrices élaborées pour l'aider dans sa démarche. Ces documents pourraient aider un tribunal à comprendre le résultat. Voilà comment les cours de révision peuvent légitimement compléter les motifs écrits sans supplanter l'analyse. Les motifs doivent être examinés en corrélation avec le résultat afin de savoir si celui-ci fait partie des issues possibles. Cette approche privilégie le fond plutôt que la forme dans les situations où le fondement de la décision est évident au vu du dossier, mais n'est pas exposé clairement dans les motifs écrits.

De plus, lors d'un contrôle fondé sur le principe de la déférence, la cour doit examiner les allégations d'erreur avec prudence, en tenant compte du contexte et de la nécessité d'éviter de substituer son opinion à celle des personnes qui sont habilitées à répondre aux questions en litige et mieux outillées qu'elle pour le faire. Étant donné que le principe de la déférence lui interdit de substituer son opinion à celle du décideur, la cour de révision doit

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mere difference of opinion. Courts must also consider the materiality of any alleged errors. An error that is peripheral to the reasoning process is not sufficient to justify quashing a decision. The same deferential approach must apply with equal force to statutory interpretation cases. In such cases, a court should not assess the decision by determining what, in its own view, would be a reasonable interpretation. Such an approach imperils deference. A *de novo* interpretation of a statute necessarily omits the perspective of the front-line, specialized administrative body that routinely applies the statutory scheme in question. By placing that perspective at the heart of the judicial review inquiry, courts display respect for specialization and expertise, and for the legislative choice to delegate certain questions to non-judicial bodies. Conversely, by imposing their own interpretation of a statute, courts undermine legislative intent.

In the instant case, there is agreement with the majority that the standard of review is reasonableness. The Registrar's reasons failed to respond to V's submission that the objectives of s. 3(2)(a) of the *Citizenship Act* require its terms to be read narrowly. Instead, the Registrar interpreted s. 3(2)(a) broadly, based on a purely textual assessment. This reading was only reasonable if the text is read in isolation from its objective. Nothing in the history of this provision indicates that Parliament intended to widen its scope. Furthermore, the judicial treatment of this provision also points to the need for a narrow interpretation. In addition, the text of s. 3(2)(c) can be seen as undermining the Registrar's interpretation of s. 3(2)(a), because the former denies citizenship to children born to individuals who enjoy diplomatic privileges and immunities equivalent to those granted to persons referred to in the latter. This suggests that s. 3(2)(a) covers only those employees in Canada of a foreign government who have such privileges and immunities, in contrast with V's parents. By ignoring the objectives of s. 3 as a whole, the Registrar's decision was unreasonable.

évaluer avec circonspection les arguments que le demandeur invoque pour contester une décision administrative afin de s'assurer qu'ils concernent le caractère raisonnable de celle-ci et ne relèvent pas d'une simple divergence d'opinions. Les tribunaux doivent également tenir compte de la gravité des erreurs reprochées. Une erreur secondaire au regard du raisonnement ne suffit pas à justifier l'annulation d'une décision. Ils doivent conserver la même attitude de déférence lorsqu'ils interprètent une disposition législative. Dans ce genre de cas, la cour de révision ne devrait pas évaluer la décision en tentant de déterminer l'interprétation qui, à son avis, serait raisonnable. Pareille approche met en péril la déférence. Une interprétation *de novo* d'une loi occulte nécessairement le point de vue de l'organisme administratif spécialisé qui applique régulièrement le régime législatif en question. En plaçant ce point de vue au cœur de leur analyse, les cours de justice témoignent de leur respect à l'endroit des compétences et connaissances spécialisées des organismes administratifs ainsi qu'à l'égard du choix du législateur de déléguer le traitement de certaines questions à des organismes non judiciaires. À l'inverse, en imposant leur propre interprétation d'une loi, les cours de justice dénaturent l'intention du législateur.

En l'espèce, il y a accord avec la majorité sur le fait que la norme de contrôle applicable est celle de la décision raisonnable. La greffière n'a pas répondu à l'argument de V voulant que les objectifs de l'al. 3(2)a) de la *Loi sur la citoyenneté* exigent une interprétation restrictive de ses termes. Au contraire, la greffière a donné une interprétation large à l'al. 3(2)a) en se fondant sur une analyse purement textuelle. Cette interprétation n'était raisonnable que si l'on examinait le texte en faisant abstraction de son objectif. L'historique de la disposition n'indique nullement que le législateur fédéral avait l'intention d'en élargir le champ d'application. De plus, la façon dont les tribunaux ont interprété cette disposition indique elle aussi qu'il faut lui donner une interprétation restrictive. Qui plus est, le texte de l'al. 3(2)c) peut être perçu comme sapant l'interprétation que la greffière donne de l'al. 3(2)a), puisque l'al. 3(2)c) nie le droit à la citoyenneté aux enfants nés de personnes bénéficiant de privilèges et immunités diplomatiques équivalents à ceux dont jouissent les personnes visées par l'al. 3(2)a). Ce texte laisse croire que l'al. 3(2)a) ne vise donc que les personnes au service au Canada d'un gouvernement étranger qui jouissent de tels privilèges et immunités, ce qui n'est pas le cas des parents de V. La décision de la greffière était déraisonnable, vu qu'elle fait fi des objectifs de l'art. 3 dans son ensemble.

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Citée par les juges Abella et Karakatsanis

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Michael H. Morris, *Marianne Zorić* and *John Provart*, for the appellant.

Hadayt Nazami, *Barbara Jackman* and *Sujith Xavier*, for the respondent.

Sara Blake and *Judie Im*, for the intervener the Attorney General of Ontario.

Stéphane Rochette, for the intervener the Attorney General of Quebec.

J. Gareth Morley and *Katie Hamilton*, for the intervener the Attorney General of British Columbia.

Kyle McCreary and *Johnna Van Parys*, for the intervener the Attorney General of Saskatchewan.

Jamie Liew, for the intervener the Canadian Council for Refugees.

Karen Andrews, for the intervener the Advocacy Centre for Tenants Ontario - Tenant Duty Counsel Program.

Matthew Britton and *Jennifer M. Lynch*, for the interveners the Ontario Securities Commission, the British Columbia Securities Commission and the Alberta Securities Commission.

Laura Bowman and *Bronwyn Roe*, for the intervener Ecojustice Canada Society.

David Corbett and *Michelle Alton*, for the interveners the Workplace Safety and Insurance Appeals Tribunal (Ontario), the Workers' Compensation Appeals Tribunal (Northwest Territories and Nunavut),

POURVOI contre un arrêt de la Cour d'appel fédérale (les juges Stratas, Webb et Gleason), 2017 CAF 132, [2018] 3 R.C.F. 75, 52 Imm. L.R. (4th) 1, 30 Admin. L.R. (6th) 1, [2017] A.C.F. nº 638 (QL), 2017 CarswellNat 9490 (WL Can.), qui a infirmé une décision du juge Bell, 2015 CF 960, [2016] 2 R.C.F. 39, 38 Imm. L.R. (4th) 110, [2015] A.C.F. nº 981 (QL), 2015 CarswellNat 4747 (WL Can.). Pourvoi rejeté.

Michael H. Morris, *Marianne Zorić* et *John Provart*, pour l'appelant.

Hadayt Nazami, *Barbara Jackman* et *Sujith Xavier*, pour l'intimé.

Sara Blake et *Judie Im*, pour l'intervenant le procureur général de l'Ontario.

Stéphane Rochette, pour l'intervenante la procureure générale du Québec.

J. Gareth Morley et *Katie Hamilton*, pour l'intervenant le procureur général de la Colombie-Britannique.

Kyle McCreary et *Johnna Van Parys*, pour l'intervenant le procureur général de la Saskatchewan.

Jamie Liew, pour l'intervenant le Conseil canadien pour les réfugiés.

Karen Andrews, pour l'intervenant le Centre ontarien de défense des droits des locataires - Programme d'avocats de service en droit du logement.

Matthew Britton et *Jennifer M. Lynch*, pour les intervenantes la Commission des valeurs mobilières de l'Ontario, British Columbia Securities Commission et Alberta Securities Commission.

Laura Bowman et *Bronwyn Roe*, pour l'intervenante Ecojustice Canada Society.

David Corbett et *Michelle Alton*, pour les intervenants le Tribunal d'appel de la sécurité professionnelle et de l'assurance contre les accidents du travail (Ontario), Workers' Compensation Appeals

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the Workers' Compensation Appeals Tribunal (Nova Scotia), the Appeals Commission for Alberta Workers' Compensation and the Workers' Compensation Appeals Tribunal (New Brunswick).

Written submissions only by *Gavin R. Cameron* and *Tom Posyniak*, for the intervener the British Columbia International Commercial Arbitration Centre Foundation.

Terrence J. O'Sullivan and *Paul Michell*, for the intervener the Council of Canadian Administrative Tribunals.

Written submissions only by *Susan L. Stewart*, *Linda R. Rothstein*, *Michael Fenrick*, *Angela E. Rae* and *Anne Marie Heenan*, for the interveners the National Academy of Arbitrators, the Ontario Labour-Management Arbitrators' Association and Conférence des arbitres du Québec.

Steven Barrett, for the intervener the Canadian Labour Congress.

Written submissions only by *William W. Shores*, *Q.C.*, and *Kirk N. Lambrecht*, *Q.C.*, for the intervener the National Association of Pharmacy Regulatory Authorities.

Brendan Van Niejenhuis and *Andrea Gonsalves*, for the intervener Queen's Prison Law Clinic.

Adam Goldenberg, for the intervener Advocates for the Rule of Law.

Toni Schweitzer, for the intervener Parkdale Community Legal Services.

Paul Warchuk and *Francis Lévesque*, for the intervener the Cambridge Comparative Administrative Law Forum.

James Plotkin and *Alyssa Tomkins*, for the intervener the Samuelson-Glushko Canadian Internet Policy and Public Interest Clinic.

Tribunal (Territoires du Nord-Ouest et Nunavut), le Tribunal d'appel des décisions de la Commission des accidents du travail de la Nouvelle-Écosse, Appeals Commission for Alberta Workers' Compensation et le Tribunal d'appel des accidents au travail (Nouveau-Brunswick).

Argumentation écrite seulement par *Gavin R. Cameron* et *Tom Posyniak*, pour l'intervenante British Columbia International Commercial Arbitration Centre Foundation.

Terrence J. O'Sullivan et *Paul Michell*, pour l'intervenant le Conseil des tribunaux administratifs canadiens.

Argumentation écrite seulement par *Susan L. Stewart*, *Linda R. Rothstein*, *Michael Fenrick*, *Angela E. Rae* et *Anne Marie Heenan*, pour les intervenantes National Academy of Arbitrators, Ontario Labour-Management Arbitrators' Association et la Conférence des arbitres du Québec.

Steven Barrett, pour l'intervenant le Congrès du travail du Canada.

Argumentation écrite seulement par *William W. Shores*, *c.r.*, et *Kirk N. Lambrecht*, *c.r.*, pour l'intervenante l'Association nationale des organismes de réglementation de la pharmacie.

Brendan Van Niejenhuis et *Andrea Gonsalves*, pour l'intervenante Queen's Prison Law Clinic.

Adam Goldenberg, pour l'intervenant Advocates for the Rule of Law.

Toni Schweitzer, pour l'intervenant Parkdale Community Legal Services.

Paul Warchuk et *Francis Lévesque*, pour l'intervenant Cambridge Comparative Administrative Law Forum.

James Plotkin et *Alyssa Tomkins*, pour l'intervenante la Clinique d'intérêt public et de politique d'internet du Canada Samuelson-Glushko.

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Guy Régimbald, for the intervener the Canadian Bar Association.

Audrey Macklin and *Anthony Navaneelan*, for the intervener the Canadian Association of Refugee Lawyers.

Written submissions only by *David Cote* and *Subodh Bharati*, for the intervener the Community & Legal Aid Services Programme.

Guillaume Cliche-Rivard and *Peter Shams*, for the intervener Association québécoise des avocats et avocates en droit de l'immigration.

Nicholas McHaffie, for the intervener the First Nations Child & Family Caring Society of Canada.

Daniel Jutras and *Audrey Boctor*, as *amici curiae*, and *Olga Redko* and *Edward Béchard Torres*.

The following is the judgment delivered by

[1] The Chief Justice and Moldaver, Gascon, Côté, Brown, Rowe and Martin JJ. — This appeal and its companion cases (see *Bell Canada v. Canada (Attorney General)*, 2019 SCC 66, [2019] 4 S.C.R. 845), provide this Court with an opportunity to re-examine its approach to judicial review of administrative decisions.

[2] In these reasons, we will address two key aspects of the current administrative law jurisprudence which require reconsideration and clarification. First, we will chart a new course forward for determining the standard of review that applies when a court reviews the merits of an administrative decision. Second, we will provide additional guidance for reviewing courts to follow when conducting reasonableness review. The revised framework will continue to be guided by the principles underlying judicial review that this Court articulated in *Dunsmuir v. New Brunswick*, 2008 SCC 9, [2008] 1 S.C.R. 190: that judicial review functions to maintain the rule of law while giving effect to legislative intent. We will also affirm the need to develop and

Guy Régimbald, pour l'intervenante l'Association du Barreau canadien.

Audrey Macklin et *Anthony Navaneelan*, pour l'intervenante l'Association canadienne des avocats et avocates en droit des réfugiés.

Argumentation écrite seulement par *David Cote* et *Subodh Bharati*, pour l'intervenant Community & Legal Aid Services Programme.

Guillaume Cliche-Rivard et *Peter Shams*, pour l'intervenante l'Association québécoise des avocats et avocates en droit de l'immigration.

Nicholas McHaffie, pour l'intervenante la Société de soutien à l'enfance et à la famille des Premières Nations du Canada.

Daniel Jutras et *Audrey Boctor*, en qualité d'*amici curiae*, et *Olga Redko* et *Edward Béchard Torres*.

Version française du jugement rendu par

[1] Le juge en chef et les juges Moldaver, Gascon, Côté, Brown, Rowe et Martin — Le présent pourvoi et les pourvois connexes (voir *Bell Canada c. Canada (Procureur général)*, 2019 CSC 66, [2019] 4 R.C.S. 845), donnent à la Cour l'occasion de se pencher de nouveau sur sa façon d'aborder le contrôle judiciaire des décisions administratives.

[2] Dans les présents motifs, nous traitons de deux aspects clés de la jurisprudence actuelle en droit administratif qu'il est nécessaire de réexaminer et de clarifier. D'abord, nous traçons la nouvelle voie à suivre pour déterminer la norme de contrôle applicable lorsqu'une cour de justice contrôle une décision administrative au fond. Ensuite, nous donnons des indications additionnelles aux cours de révision qui procèdent au contrôle selon la norme de la décision raisonnable. Le cadre d'analyse révisé est encore guidé par les principes en matière de contrôle judiciaire qu'a énoncés la Cour dans l'arrêt *Dunsmuir c. Nouveau-Brunswick*, 2008 CSC 9, [2008] 1 R.C.S. 190 : le contrôle judiciaire a pour fonction de préserver la primauté du droit tout en

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strengthen a culture of justification in administrative decision making.

[3] We will then address the merits of the case at bar, which relates to an application for judicial review of a decision by the Canadian Registrar of Citizenship concerning Alexander Vavilov, who was born in Canada and whose parents were later revealed to be Russian spies. The Registrar found on the basis of an interpretation of s. 3(2)(a) of the *Citizenship Act*, R.S.C. 1985, c. C-29, that Mr. Vavilov was not a Canadian citizen and cancelled his certificate of citizenship under s. 26(3) of the *Citizenship Regulations*, SOR/93-246. In our view, the standard of review to be applied to the Registrar's decision is reasonableness, and the Registrar's decision was unreasonable. We would therefore uphold the Federal Court of Appeal's decision to quash it, and would dismiss the Minister of Citizenship and Immigration's appeal.

I. Need for Clarification and Simplification of the Law of Judicial Review

[4] Over the past decades, the law relating to judicial review of administrative decisions in Canada has been characterized by continuously evolving jurisprudence and vigorous academic debate. This area of the law concerns matters which are fundamental to our legal and constitutional order, and seeks to navigate the proper relationship between administrative decision makers, the courts and individuals in our society. In parallel with the law, the role of administrative decision making in Canada has also evolved. Today, the administration of countless public bodies and regulatory regimes has been entrusted to statutory delegates with decision-making power. The number, diversity and importance of the matters that come before such delegates has made administrative decision making one of the principal manifestations of state power in the lives of Canadians.

[5] Given the ubiquity and practical importance of administrative decision making, it is essential

donnant effet à la volonté du législateur. Nous insistons également sur la nécessité de développer et de renforcer une culture de la justification au sein du processus décisionnel administratif.

[3] Nous examinons ensuite le fond de l'affaire en l'espèce, qui porte sur une demande de contrôle judiciaire d'une décision rendue par la greffière de la citoyenneté canadienne concernant M. Alexander Vavilov, né au Canada de parents qui se sont plus tard révélés être des espions russes. Se fondant sur une interprétation de l'al. 3(2)a) de la *Loi sur la citoyenneté*, L.R.C. 1985, c. C-29, la greffière a conclu que M. Vavilov n'était pas un citoyen canadien et a annulé son certificat de citoyenneté en application du par. 26(3) du *Règlement sur la citoyenneté*, DORS/93-246. Selon nous, la norme de contrôle applicable est celle de la décision raisonnable et la décision de la greffière était déraisonnable. Nous sommes donc d'avis de confirmer l'arrêt par lequel la Cour d'appel fédérale la casse et de rejeter le pourvoi du ministre de la Citoyenneté et de l'Immigration.

I. La nécessité de clarifier et de simplifier le droit relatif au contrôle judiciaire

[4] Au cours des dernières décennies, le droit canadien relatif au contrôle judiciaire des décisions administratives a connu une évolution jurisprudentielle continue et donné lieu à un vigoureux débat doctrinal. Ce domaine du droit touche des questions fondamentales pour notre ordre juridique et constitutionnel et tente d'assurer la bonne marche des rapports entre les décideurs administratifs, les cours de justice et les membres de notre société. Parallèlement au droit, le rôle du processus décisionnel administratif au Canada a connu sa propre évolution. Aujourd'hui, l'administration d'innombrables organismes publics et régimes de réglementation est confiée par la loi à des délégataires ayant un pouvoir décisionnel. Le nombre, la diversité et l'importance des affaires dont sont saisis ces délégataires font du processus décisionnel administratif l'une des principales manifestations du pouvoir de l'État dans la vie de la population canadienne.

[5] Vu l'omniprésence du processus décisionnel administratif et son importance pratique, il est essentiel

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that administrative decision makers, those subject to their decisions and courts tasked with reviewing those decisions have clear guidance on how judicial review is to be performed.

[6] In granting leave to appeal in the case at bar and in its companion cases, this Court's leave to appeal judgment made clear that it viewed these appeals as an opportunity to consider the law applicable to the judicial review of administrative decisions as addressed in *Dunsmuir* and subsequent cases. In light of the importance of this issue, the Court appointed two *amici curiae*, invited the parties to devote a substantial portion of their submissions to the standard of review issue, and granted leave to 27 interveners, comprising 4 attorneys general and numerous organizations representing the breadth of the Canadian administrative law landscape. We have, as a result, received a wealth of helpful submissions on this issue. Despite this Court's review of the subject in *Dunsmuir*, some aspects of the law remain challenging. In particular, the submissions presented to the Court have highlighted two aspects of the current framework which need clarification.

[7] The first aspect is the analysis for determining the standard of review. It has become clear that *Dunsmuir*'s promise of simplicity and predictability in this respect has not been fully realized. In *Dunsmuir*, a majority of the Court merged the standards of "patent unreasonableness" and "reasonableness *simpliciter*" into a single "reasonableness" standard, thus reducing the number of standards of review from three to two: paras. 34-50. It also sought to simplify the analysis for determining the applicable standard of review: paras. 51-64. Since *Dunsmuir*, the jurisprudence has evolved to recognize that reasonableness will be the applicable standard for most categories of questions on judicial review, including, presumptively, when a decision maker interprets its enabling statute: see, e.g., *Alberta (Information and Privacy Commissioner) v. Alberta Teachers' Association*, 2011 SCC 61, [2011] 3 S.C.R. 654; *Mouvement laïque québécois v. Saguenay (City)*, 2015 SCC 16, [2015] 2 S.C.R. 3, at para. 46; *Canadian National Railway Co. v. Canada (Attorney General)*, 2014 SCC 40, [2014] 2 S.C.R. 135, at para. 55; *Canadian*

que les décideurs administratifs, les personnes visées par leurs décisions et les tribunaux chargés de contrôler ces décisions disposent d'indications claires sur la façon dont le contrôle judiciaire doit être exercé.

[6] Dans son jugement qui accorde l'autorisation de pourvoi dans la présente affaire et les affaires connexes, la Cour a clairement indiqué qu'elle considère les présents pourvois comme une occasion de se pencher sur le droit applicable au contrôle judiciaire des décisions administratives tel que traité dans l'arrêt *Dunsmuir* et les arrêts subséquents. Vu l'importance de cet enjeu, la Cour a nommé deux *amici curiae*, invité les parties à consacrer une bonne partie de leurs arguments à la question de la norme de contrôle et accordé l'autorisation d'intervenir à 27 intervenants, dont 4 procureurs généraux et de nombreuses organisations représentatives de tout l'éventail du droit administratif canadien. Nous avons en conséquence reçu une grande quantité d'observations utiles sur ce sujet. Bien que la Cour ait examiné la question dans l'arrêt *Dunsmuir*, certains aspects du droit demeurent épineux. Les observations présentées à la Cour ont mis en relief deux aspects du cadre d'analyse actuel qu'il est nécessaire de clarifier.

[7] Le premier aspect concerne l'analyse visant à déterminer la norme de contrôle applicable. Il est devenu évident que la promesse de simplicité et de prévisibilité formulée à cet égard dans l'arrêt *Dunsmuir* ne s'est pas pleinement réalisée. Dans l'arrêt *Dunsmuir*, les juges majoritaires de la Cour ont fusionné la norme de la décision « manifestement déraisonnable » et la norme de la décision « raisonnable *simpliciter* » en une seule norme de la décision « raisonnable », en ramenant ainsi les normes de contrôle de trois à deux : par. 34-50. En outre, la Cour a voulu simplifier l'analyse relative à la norme de contrôle : par. 51-64. Depuis cet arrêt, la jurisprudence a évolué et reconnaît dorénavant que la norme de la décision raisonnable est la norme qui s'applique à la plupart des catégories de questions qui se posent dans le cadre d'un contrôle judiciaire; notamment, son application se présume lorsque le décideur interprète sa loi habilitante : voir, p. ex., *Alberta (Information and Privacy Commissioner) c. Alberta Teachers' Association*, 2011 CSC 61, [2011] 3 R.C.S. 654; *Mouvement laïque québécois c. Saguenay (Ville)*,

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Artists' Representation v. National Gallery of Canada, 2014 SCC 42, [2014] 2 S.C.R. 197, at para. 13; *Smith v. Alliance Pipeline Ltd.*, 2011 SCC 7, [2011] 1 S.C.R. 160, at paras. 26 and 28; *Canada (Citizenship and Immigration) v. Khosa*, 2009 SCC 12, [2009] 1 S.C.R. 339, at para. 25; *Dunsmuir*, at para. 54. The Court has indicated that this presumption may be rebutted by showing the issue on review falls within a category of questions attracting correctness review: see *McLean v. British Columbia (Securities Commission)*, 2013 SCC 67, [2013] 3 S.C.R. 895, at para. 22. It may also be rebutted by showing that the context indicates that the legislature intended the standard of review to be correctness: *McLean*, at para. 22; *Edmonton (City) v. Edmonton East (Capilano) Shopping Centres Ltd.*, 2016 SCC 47, [2016] 2 S.C.R. 293, at para. 32; *Canada (Canadian Human Rights Commission) v. Canada (Attorney General)*, 2018 SCC 31, [2018] 2 S.C.R. 230 ("*CHRC*"), at paras. 45-46. However, uncertainty about when the contextual analysis remains appropriate and debate surrounding the scope of the correctness categories have sometimes caused confusion and made the analysis unwieldy: see, e.g., P. Daly, "Struggling Towards Coherence in Canadian Administrative Law? Recent Cases on Standard of Review and Reasonableness" (2016), 62 *McGill L.J.* 527.

[8] In addition, this analysis has in some respects departed from the theoretical foundations underpinning judicial review. While the application of the reasonableness standard is grounded, in part, in the necessity of avoiding "undue interference" in the face of the legislature's intention to leave certain questions with administrative bodies rather than with the courts (see *Dunsmuir*, at para. 27), that standard has come to be routinely applied even where the legislature has provided for a different institutional structure through a statutory appeal mechanism.

2015 CSC 16, [2015] 2 R.C.S. 3, par. 46; *Compagnie des chemins de fer nationaux du Canada c. Canada (Procureur général)*, 2014 CSC 40, [2014] 2 R.C.S. 135, par. 55; *Front des artistes canadiens c. Musée des beaux-arts du Canada*, 2014 CSC 42, [2014] 2 R.C.S. 197, par. 13; *Smith c. Alliance Pipeline Ltd.*, 2011 CSC 7, [2011] 1 R.C.S. 160, par. 26 et 28; *Canada (Citoyenneté et Immigration) c. Khosa*, 2009 CSC 12, [2009] 1 R.C.S. 339, par. 25; *Dunsmuir*, par. 54. La Cour a par ailleurs précisé que cette présomption peut être réfutée en établissant que la question sous examen appartient à une catégorie de questions qui sont assujetties à la norme de la décision correcte : voir *McLean c. Colombie-Britannique (Securities Commission)*, 2013 CSC 67, [2013] 3 R.C.S. 895, par. 22. Elle peut aussi être réfutée en établissant que, d'après le contexte, le législateur a voulu que la norme de contrôle applicable soit celle de la décision correcte : *McLean*, par. 22; *Edmonton (Ville) c. Edmonton East (Capilano) Shopping Centres Ltd.*, 2016 CSC 47, [2016] 2 R.C.S. 293, par. 32; *Canada (Commission canadienne des droits de la personne) c. Canada (Procureur général)*, 2018 CSC 31, [2018] 2 R.C.S. 230 (« *CCDP* »), par. 45-46. Cependant, l'incertitude quant à savoir dans quel cas l'analyse contextuelle demeure indiquée, ainsi que le débat sur la portée des catégories de questions auxquelles s'applique la norme de la décision correcte ont parfois semé la confusion et compliqué l'analyse : voir, p. ex., P. Daly, « Struggling Towards Coherence in Canadian Administrative Law? Recent Cases on Standard of Review and Reasonableness » (2016), 62 *R.D. McGill* 527.

[8] En outre, cette analyse s'est à certains égards écartée des fondements théoriques du contrôle judiciaire. Si l'application de la norme de la décision raisonnable est fondée en partie sur la nécessité pour les cours de justice d'éviter « toute immixtion injustifiée » compte tenu de la volonté du législateur de laisser aux organismes administratifs, plutôt qu'à elles, le soin de trancher certaines questions (voir *Dunsmuir*, par. 27), son application générale s'est imposée même lorsque le législateur a instauré un régime institutionnel différent en créant un mécanisme d'appel par voie législative.

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[9] The uncertainty that has followed *Dunsmuir* has been highlighted by judicial and academic criticism, litigants who have come before this Court, and organizations that represent Canadians who interact with administrative decision makers. These are not light critiques or theoretical challenges. They go to the core of the coherence of our administrative law jurisprudence and to the practical implications of this lack of coherence. This Court, too, has taken note. In *Wilson v. Atomic Energy of Canada Ltd.*, 2016 SCC 29, [2016] 1 S.C.R. 770, at para. 19, Abella J. expressed the need to "simplify the standard of review labyrinth we currently find ourselves in" and offered suggestions with a view to beginning a necessary conversation on the way forward. It is in this context that the Court decided to grant leave to hear this case and the companion cases jointly.

[9] L'incertitude qui a suivi l'arrêt *Dunsmuir* a été mise en évidence par des critiques judiciaires et doctrinales, des plaideurs qui ont comparu devant notre Cour et des organisations représentant des Canadiens et des Canadiennes qui interagissent avec des décideurs administratifs. Il ne s'agit pas de critiques sans importance ou de difficultés théoriques. Ces critiques touchent au cœur de la cohérence de notre jurisprudence en droit administratif et aux ramifications pratiques de ce manque de cohérence. Notre Cour en a pris note elle aussi. Dans l'arrêt *Wilson c. Énergie Atomique du Canada Ltée*, 2016 CSC 29, [2016] 1 R.C.S. 770, par. 19, la juge Abella a exprimé le besoin de « simplifier le labyrinthe actuel de la norme de contrôle applicable » et a donné des suggestions dans le but d'amorcer un dialogue nécessaire sur la voie à suivre. C'est dans ce contexte que la Cour a décidé d'accorder l'autorisation d'appel pour instruire ensemble la présente affaire et les affaires connexes.

[10] This process has led us to conclude that a reconsideration of this Court's approach is necessary in order to bring greater coherence and predictability to this area of law. We have therefore adopted a revised framework for determining the standard of review where a court reviews the merits of an administrative decision. The analysis begins with a presumption that reasonableness is the applicable standard in all cases. Reviewing courts should derogate from this presumption only where required by a clear indication of legislative intent or by the rule of law.

[10] Ce cheminement nous amène à conclure qu'il est nécessaire de revoir l'approche de la Cour afin d'apporter une cohérence et une prévisibilité accrues à ce domaine du droit. Nous adoptons donc un cadre d'analyse révisé permettant de déterminer la norme de contrôle applicable lorsqu'une cour de justice se penche sur le fond d'une décision administrative. Ce cadre d'analyse repose sur la présomption voulant que la norme de la décision raisonnable soit la norme applicable dans tous les cas. Les cours de révision ne devraient déroger à cette présomption que lorsqu'une indication claire de l'intention du législateur ou la primauté du droit l'exige.

[11] The second aspect is the need for better guidance from this Court on the proper application of the reasonableness standard. The Court has heard concerns that reasonableness review is sometimes perceived as advancing a two-tiered justice system in which those subject to administrative decisions are entitled only to an outcome somewhere between "good enough" and "not quite wrong". These concerns have been echoed by some members of the legal profession, civil society organizations and legal clinics. The Court has an obligation to take these perspectives seriously and to ensure that the framework it adopts accommodates all types of administrative

[11] Le deuxième aspect concerne la nécessité d'indications plus précises de la Cour sur l'application appropriée de la norme de contrôle de la décision raisonnable. La Cour a entendu les préoccupations exprimées au sujet de la norme de la décision raisonnable qui est parfois perçue comme favorisant un système de justice à deux vitesses où les personnes visées par des décisions administratives n'ont droit qu'à un résultat se situant entre une solution « assez bonne » et une solution « pas trop mauvaise ». Ces préoccupations ont été reprises par des membres de la profession juridique, des organisations de la société civile et des cliniques juridiques. La Cour se

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decision making, in areas that range from immigration, prison administration and social security entitlements to labour relations, securities regulation and energy policy.

[12] These concerns regarding the application of the reasonableness standard speak to the need for this Court to more clearly articulate what that standard entails and how it should be applied in practice. Reasonableness review is methodologically distinct from correctness review. It is informed by the need to respect the legislature's choice to delegate decision-making authority to the administrative decision maker rather than to the reviewing court. In order to fulfill *Dunsmuir*'s promise to protect "the legality, the reasonableness and the fairness of the administrative process and its outcomes", reasonableness review must entail a sensitive and respectful, but robust, evaluation of administrative decisions: para. 28.

[13] Reasonableness review is an approach meant to ensure that courts intervene in administrative matters only where it is truly necessary to do so in order to safeguard the legality, rationality and fairness of the administrative process. It finds its starting point in the principle of judicial restraint and demonstrates a respect for the distinct role of administrative decision makers. However, it is not a "rubber-stamping" process or a means of sheltering administrative decision makers from accountability. It remains a robust form of review.

[14] On the one hand, courts must recognize the legitimacy and authority of administrative decision makers within their proper spheres and adopt an appropriate posture of respect. On the other hand, administrative decision makers must adopt a culture of justification and demonstrate that their exercise of delegated public power can be "justified to citizens in terms of rationality and fairness": the Rt.

doit de prendre ces points de vue au sérieux et de voir à ce que le cadre d'analyse qu'elle retient s'adapte à tous les types de décisions administratives, qui vont de l'immigration, de l'administration carcérale et des programmes de sécurité sociale aux relations de travail, à la réglementation des valeurs mobilières et à la politique énergétique.

[12] Ces préoccupations sur l'application de la norme de la décision raisonnable témoignent de la nécessité d'expliquer plus clairement ce que signifie cette norme et comment elle devrait être appliquée en pratique. Le contrôle selon la norme de la décision raisonnable est méthodologiquement distinct du contrôle selon la norme de la décision correcte. Il tient compte de la nécessité de respecter le choix du législateur de déléguer le pouvoir décisionnel à un décideur administratif plutôt qu'à une cour de révision. Afin de remplir la promesse formulée dans l'arrêt *Dunsmuir* d'assurer « la légalité, la rationalité et l'équité du processus administratif et de la décision rendue », le contrôle selon la norme de la décision raisonnable doit comporter une évaluation sensible et respectueuse, mais aussi rigoureuse, des décisions administratives : par. 28.

[13] Le contrôle selon la norme de la décision raisonnable est une approche visant à faire en sorte que les cours de justice interviennent dans les affaires administratives uniquement lorsque cela est vraiment nécessaire pour préserver la légitimité, la rationalité et l'équité du processus administratif. Il tire son origine du principe de la retenue judiciaire et témoigne d'un respect envers le rôle distinct des décideurs administratifs. Toutefois, il ne s'agit pas d'une « simple formalité » ni d'un moyen visant à soustraire les décideurs administratifs à leur obligation de rendre des comptes. Ce type de contrôle demeure rigoureux.

[14] D'une part, les cours de justice doivent reconnaître la légitimité et la compétence des décideurs administratifs dans leur propre domaine et adopter une attitude de respect. D'autre part, les décideurs administratifs doivent adhérer à une culture de la justification et démontrer que l'exercice du pouvoir public qui leur est délégué peut être [TRADUCTION] « justifié aux yeux des citoyens et citoyennes sur

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Hon. B. McLachlin, "The Roles of Administrative Tribunals and Courts in Maintaining the Rule of Law" (1998), 12 *C.J.A.L.P.* 171, at p. 174 (emphasis deleted); see also M. Cohen-Eliya and I. Porat, "Proportionality and Justification" (2014), 64 *U.T.L.J.* 458, at pp. 467-70.

[15] In conducting a reasonableness review, a court must consider the outcome of the administrative decision in light of its underlying rationale in order to ensure that the decision as a whole is transparent, intelligible and justified. What distinguishes reasonableness review from correctness review is that the court conducting a reasonableness review must focus on the decision the administrative decision maker actually made, including the justification offered for it, and not on the conclusion the court itself would have reached in the administrative decision maker's place.

II. Determining the Applicable Standard of Review

[16] In the following sections, we set out a revised framework for determining the standard of review a court should apply when the merits of an administrative decision are challenged. It starts with a presumption that reasonableness is the applicable standard whenever a court reviews administrative decisions.

[17] The presumption of reasonableness review can be rebutted in two types of situations. The first is where the legislature has indicated that it intends a different standard or set of standards to apply. This will be the case where the legislature explicitly prescribes the applicable standard of review. It will also be the case where the legislature has provided a statutory appeal mechanism from an administrative decision to a court, thereby signalling the legislature's intent that appellate standards apply when a court reviews the decision. The second situation in which the presumption of reasonableness review will be rebutted is where the rule of law requires that

les plans de la rationalité et de l'équité » : la très honorable B. McLachlin, « The Roles of Administrative Tribunals and Courts in Maintaining the Rule of Law » (1998), 12 *R.C.D.A.P.* 171, p. 174 (italique omis); voir également M. Cohen-Eliya et I. Porat, « Proportionality and Justification » (2014), 64 *U.T.L.J.* 458, p. 467-470.

[15] Lorsqu'elle effectue un contrôle selon la norme de la décision raisonnable, la cour de révision doit tenir compte du résultat de la décision administrative eu égard au raisonnement sous-jacent à celle-ci afin de s'assurer que la décision dans son ensemble est transparente, intelligible et justifiée. Ce qui distingue le contrôle selon la norme de la décision raisonnable du contrôle selon la norme de la décision correcte tient au fait que la cour de justice effectuant le premier type de contrôle doit centrer son attention sur la décision même qu'a rendue le décideur administratif, notamment sur sa justification, et non sur la conclusion à laquelle elle serait parvenue à la place du décideur administratif.

II. La détermination de la norme de contrôle applicable

[16] Dans les sections qui suivent, nous exposons un cadre d'analyse révisé permettant à une cour de justice de déterminer la norme de contrôle applicable en cas de contestation qui porte sur le fond d'une décision administrative. Ce cadre d'analyse repose sur la présomption voulant que la norme de la décision raisonnable soit la norme applicable chaque fois qu'une cour contrôle une décision administrative.

[17] La présomption d'application de la norme de la décision raisonnable peut être réfutée dans deux types de situations. La première est celle où le législateur a indiqué qu'il souhaite l'application d'une norme différente ou d'un ensemble de normes différentes. C'est le cas lorsque le législateur a prescrit expressément la norme de contrôle applicable. C'est aussi le cas lorsque le législateur a prévu un mécanisme d'appel d'une décision administrative devant une cour, indiquant ainsi son intention que les cours de justice recourent, en matière de contrôle, aux normes applicables en appel. La deuxième situation où la présomption d'application de la norme

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the standard of correctness be applied. This will be the case for certain categories of questions, namely constitutional questions, general questions of law of central importance to the legal system as a whole and questions related to the jurisdictional boundaries between two or more administrative bodies. The general rule of reasonableness review, when coupled with these limited exceptions, offers a comprehensive approach to determining the applicable standard of review. As a result, it is no longer necessary for courts to engage in a "contextual inquiry" (*CHRC*, at paras. 45-47; see also *Dunsmuir*, at paras. 62-64; *McLean*, at para. 22) in order to identify the appropriate standard.

[18] Before setting out the framework for determining the standard of review in greater detail, we wish to acknowledge that these reasons depart from the Court's existing jurisprudence on standard of review in certain respects. Any reconsideration such as this can be justified only by compelling circumstances, and we do not take this decision lightly. A decision to adjust course will always require the Court to carefully weigh the impact on legal certainty and predictability against the costs of continuing to follow a flawed approach: see *Canada (Attorney General) v. Bedford*, 2013 SCC 72, [2013] 3 S.C.R. 1101, at para. 47; *Canada v. Craig*, 2012 SCC 43, [2012] 2 S.C.R. 489, at paras. 24-27; *Ontario (Attorney General) v. Fraser*, 2011 SCC 20, [2011] 2 S.C.R. 3, at paras. 56-57, 129-31 and 139; *R. v. Henry*, 2005 SCC 76, [2005] 3 S.C.R. 609, at paras. 43-44; *R. v. Bernard*, [1988] 2 S.C.R. 833, at pp. 849-50.

[19] On this point, we recall the observation of Gibbs J. in *Queensland v. Commonwealth* (1977), 139 C.L.R. 585 (H.C.A.), which this Court endorsed in *Craig*, at para. 26:

No Justice is entitled to ignore the decisions and reasoning of his predecessors, and to arrive at his own judgment as though the pages of the law reports were blank, or as though the authority of a decision did not survive beyond

de la décision raisonnable est réfutée est celle où la primauté du droit commande l'application de la norme de la décision correcte. C'est le cas pour certaines catégories de questions, soit les questions constitutionnelles, les questions de droit générales d'importance capitale pour le système juridique dans son ensemble et les questions liées aux délimitations des compétences respectives d'organismes administratifs. Conjuguée à ces exceptions limitées, la règle générale qui prévoit l'application de la norme de la décision raisonnable met en place une méthode complète pour déterminer la norme de contrôle applicable. En conséquence, les cours de justice ne sont plus tenues de recourir à une « analyse contextuelle » (*CCDP*, par. 45-47; voir aussi *Dunsmuir*, par. 62-64; *McLean*, par. 22) pour établir la bonne norme de contrôle.

[18] Avant d'exposer plus en détail le cadre d'analyse permettant de déterminer la norme de contrôle applicable, nous tenons à reconnaître que les présents motifs s'écartent à certains égards de la jurisprudence actuelle de la Cour en la matière. Seules des circonstances convaincantes peuvent justifier un réexamen comme celui effectué en l'espèce. Nous ne prenons pas cette décision à la légère. La décision d'opérer un changement de cap oblige toujours la Cour à soupeser soigneusement l'incidence de cette décision sur la certitude et la prévisibilité juridiques par rapport aux coûts liés au fait de continuer à souscrire à une approche erronée : voir *Canada (Procureur général) c. Bedford*, 2013 CSC 72, [2013] 3 R.C.S. 1101, par. 47; *Canada c. Craig*, 2012 CSC 43, [2012] 2 R.C.S. 489, par. 24-27; *Ontario (Procureur général) c. Fraser*, 2011 CSC 20, [2011] 2 R.C.S. 3, par. 56-57, 129-131 et 139; *R. c. Henry*, 2005 CSC 76, [2005] 3 R.C.S. 609, par. 43-44; *R. c. Bernard*, [1988] 2 R.C.S. 833, p. 849-850.

[19] À cet égard, nous rappelons les propos du juge Gibbs dans *Queensland c. Commonwealth* (1977), 139 C.L.R. 585 (H.C.A.), auxquels notre Cour a souscrit dans l'arrêt *Craig*, par. 26 :

[TRADUCTION] Nul juge ne peut ignorer les décisions et le raisonnement de ses prédécesseurs et arriver à ses propres conclusions comme si la jurisprudence n'existait pas, ou qu'une décision cessait d'être opposable dès l'ajournement

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the rising of the Court. A Justice, unlike a legislator, cannot introduce a programme of reform which sets at nought decisions formerly made and principles formerly established. It is only after the most careful and respectful consideration of the earlier decision, and after giving due weight to all the circumstances, that a Justice may give effect to his own opinions in preference to an earlier decision of the Court.

[20] Nonetheless, this Court has in the past revisited precedents that were determined to be unsound in principle, that had proven to be unworkable and unnecessarily complex to apply, or that had attracted significant and valid judicial, academic and other criticism: *Craig*, at paras. 28-30; *Henry*, at paras. 45-47; *Fraser*, at para. 135 (per Rothstein J., concurring in the result); *Bernard*, at pp. 858-59. Although adhering to the established jurisprudence will generally promote certainty and predictability, in some instances doing so will create or perpetuate uncertainty in the law: *Minister of Indian Affairs and Northern Development v. Ranville*, [1982] 2 S.C.R. 518, at p. 528; *Bernard*, at p. 858; *R. v. B. (K.G.)*, [1993] 1 S.C.R. 740, at p. 778. In such circumstances, "following the prior decision because of *stare decisis* would be contrary to the underlying value behind that doctrine, namely, clarity and certainty in the law": *Bernard*, at p. 858. These considerations apply here.

[21] Certain aspects of the current framework are unclear and unduly complex. The practical effect of this lack of clarity is that courts sometimes struggle in conducting the standard of review analysis, and costly debates surrounding the appropriate standard and its application continue to overshadow the review on the merits in many cases, thereby undermining access to justice. The words of Binnie J. in his concurring reasons in *Dunsmuir*, at para. 133, are still apt:

> . . . judicial review is burdened with undue cost and delay. Litigants understandably hesitate to go to court to seek redress for a perceived administrative injustice if their lawyers cannot predict with confidence even what standard of review will be applied. . . . If litigants do take the plunge, they may find the court's attention focussed not on their complaints, or the government's response, but on lengthy and arcane discussions of something they are told

d'une session. Contrairement au législateur, le juge ne peut entreprendre une réforme qui réduit à néant les décisions antérieures et les principes établis précédemment. Ce n'est qu'après avoir examiné la décision antérieure de la cour le plus attentivement et le plus respectueusement possible, et après avoir dûment considéré toutes les circonstances, que le juge peut faire primer sa propre opinion sur elle.

[20] Néanmoins, la Cour a revu des précédents qui avaient été jugés non fondés en principe, dont il a été démontré qu'ils étaient inapplicables et indûment complexes, ou qui s'étaient attirés d'importantes critiques valables, notamment judiciaires et doctrinales : *Craig*, par. 28-30; *Henry*, par. 45-47; *Fraser*, par. 135 (le juge Rothstein, motifs concordants quant au résultat); *Bernard*, p. 858-859. Si le respect de la jurisprudence établie favorise généralement la certitude et la prévisibilité, dans certains cas, ce respect crée ou perpétue l'incertitude du droit : *Ministre des Affaires indiennes et du Nord canadien c. Ranville*, [1982] 2 R.C.S. 518, p. 528; *Bernard*, p. 858; *R. c. B. (K.G.)*, [1993] 1 R.C.S. 740, p. 778. Dans ces circonstances, « en [. . .] suivant simplement [l'arrêt antérieur] par respect pour le principe du *stare decisis*, on se [trouve à] aller à l'encontre de la valeur fondamentale sous-tendant ce principe, c'est-à-dire celle de la clarté et de la certitude du droit » : *Bernard*, p. 858. Ces considérations s'appliquent en l'espèce.

[21] Certains aspects du cadre d'analyse actuel ne sont pas clairs et sont indûment complexes. Ce manque de clarté a pour effet pratique que les cours de justice ont parfois de la difficulté à effectuer l'analyse relative à la norme de contrôle. De coûteux débats entourant la norme appropriée et son application continuent d'éclipser le contrôle sur le fond dans bien des cas, ce qui mine l'accès à la justice. Les propos du juge Binnie dans ses motifs concordants dans l'arrêt *Dunsmuir*, par. 133, sont toujours pertinents :

> . . . le contrôle judiciaire est à la fois trop coûteux et trop long. On comprend le justiciable d'hésiter à s'adresser aux tribunaux pour obtenir réparation à l'égard de ce qu'il considère comme une injustice administrative lorsque son avocat ne peut même pas prévoir avec certitude quelle norme de contrôle s'appliquera. [. . .] Le justiciable qui va de l'avant constate que la cour ne met pas l'accent sur sa prétention ou sur la mesure prise par l'État, mais qu'elle

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is [the choice of standard analysis]. . . . A victory before the reviewing court may be overturned on appeal because the wrong "standard of review" was selected. A small business denied a licence or a professional person who wants to challenge disciplinary action should be able to seek judicial review without betting the store or the house on the outcome.

Regrettably, we find ourselves in a similar position following *Dunsmuir*. As Karakatsanis J. observed in *Edmonton East*, at para. 35, "[t]he contextual approach can generate uncertainty and endless litigation concerning the standard of review". While counsel and courts attempt to work through the complexities of determining the standard of review and its proper application, litigants "still find the merits waiting in the wings for their chance to be seen and reviewed": *Wilson*, at para. 25, per Abella J.

[22] As noted in *CHRC*, this Court "has for years attempted to simplify the standard of review analysis in order to 'get the parties away from arguing about the tests and back to arguing about the substantive merits of their case'": para. 27, quoting *Alberta Teachers*, at para. 36, citing *Dunsmuir*, at para. 145, per Binnie J. The principled changes set out below seek to promote the values underlying *stare decisis* and to make the law on the standard of review more certain, coherent and workable going forward.

A. *Presumption That Reasonableness Is the Applicable Standard*

[23] Where a court reviews the merits of an administrative decision (i.e., judicial review of an administrative decision other than a review related to a breach of natural justice and/or the duty of procedural fairness), the standard of review it applies must reflect the legislature's intent with respect to the role of the reviewing court, except where giving effect to that intent is precluded by the rule of law.

arbitre plutôt un long et mystérieux débat sur [l'analyse du choix de la norme]. [. . .] La décision favorable rendue par la cour de révision peut être infirmée en appel au motif que la bonne « norme de contrôle » n'a pas été appliquée. La petite entreprise à qui on refuse un permis ou le professionnel qui fait l'objet d'une mesure disciplinaire devrait pouvoir demander le contrôle judiciaire de la décision sans miser son commerce ou sa maison sur l'issue de l'instance.

Malheureusement, nous nous retrouvons dans une situation semblable depuis l'arrêt *Dunsmuir*. Comme l'a fait remarquer la juge Karakatsanis dans l'arrêt *Edmonton East*, au par. 35, « [l]e recours à une analyse contextuelle peut être source d'incertitude et d'interminables litiges au sujet de la norme de contrôle applicable ». Bien que les avocats et les cours de justice tentent de surmonter la difficulté de déterminer la norme de contrôle et la bonne façon de l'appliquer, les plaideurs prennent note que, « [p]endant ce temps, l'analyse au fond attend en coulisses » : *Wilson*, par. 25, la juge Abella.

[22] Comme il a été souligné dans l'arrêt *CCDP*, « [d]epuis plusieurs années, notre Cour tente de simplifier l'analyse relative à la norme de contrôle applicable, afin de "faire en sorte que les parties cessent de débattre des critères applicables et fassent plutôt valoir leurs prétentions sur le fond" » : par. 27, citant *Alberta Teachers*, par. 36, citant *Dunsmuir*, par. 145, le juge Binnie. Les changements de principe exposés ci-dessous visent à promouvoir les valeurs qui sous-tendent la règle du *stare decisis* et à rendre le droit applicable en matière de norme de contrôle plus certain, cohérent et facile à appliquer à l'avenir.

A. *La présomption selon laquelle la norme applicable est celle de la décision raisonnable*

[23] Lorsqu'une cour examine une décision administrative sur le fond (c.-à-d. le contrôle judiciaire d'une mesure administrative qui ne comporte pas d'examen d'un manquement à la justice naturelle ou à l'obligation d'équité procédurale), la norme de contrôle qu'elle applique doit refléter l'intention du législateur sur le rôle de la cour de révision, sauf dans les cas où la primauté du droit empêche de donner

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The starting point for the analysis is a presumption that the legislature intended the standard of review to be reasonableness.

[24] Parliament and the provincial legislatures are constitutionally empowered to create administrative bodies and to endow them with broad statutory powers: *Dunsmuir*, at para. 27. Where a legislature has created an administrative decision maker for the specific purpose of administering a statutory scheme, it must be presumed that the legislature also intended that decision maker to be able to fulfill its mandate and interpret the law as applicable to all issues that come before it. Where a legislature has not explicitly prescribed that a court is to have a role in reviewing the decisions of that decision maker, it can safely be assumed that the legislature intended the administrative decision maker to function with a minimum of judicial interference. However, because judicial review is protected by s. 96 of the *Constitution Act, 1867*, legislatures cannot shield administrative decision making from curial scrutiny entirely: *Dunsmuir*, at para. 31; *Crevier v. Attorney General of Quebec*, [1981] 2 S.C.R. 220, at pp. 236-37; *U.E.S., Local 298 v. Bibeault*, [1988] 2 S.C.R. 1048, at p. 1090. Nevertheless, respect for these institutional design choices made by the legislature requires a reviewing court to adopt a posture of restraint on review.

[25] For years, this Court's jurisprudence has moved toward a recognition that the reasonableness standard should be the starting point for a court's review of an administrative decision. Indeed, a presumption of reasonableness review is already a well-established feature of the standard of review analysis in cases in which administrative decision makers interpret their home statutes: see *Alberta Teachers*, at para. 30; *Saguenay*, at para. 46; *Edmonton East*, at para. 22. In our view, it is now appropriate to hold that whenever a court reviews an administrative decision, it should start with the presumption that the applicable standard of review for all aspects of that decision will be reasonableness. While this presumption applies to the administrative decision maker's interpretation of its enabling statute, the

effet à cette intention. L'analyse a donc comme point de départ une présomption selon laquelle le législateur a voulu que la norme de contrôle applicable soit celle de la décision raisonnable.

[24] Le Parlement et les législatures provinciales sont habilités par la Constitution à créer des organismes administratifs et à les investir de larges pouvoirs légaux : *Dunsmuir*, par. 27. Si le législateur a constitué un décideur administratif dans le but précis d'administrer un régime législatif, il faut présumer que le législateur a également voulu que ce décideur soit en mesure d'accomplir son mandat et d'interpréter la loi qui s'applique à toutes les questions qui lui sont soumises. Si le législateur n'a pas prescrit expressément que les cours de justice ont un rôle à jouer dans le contrôle des décisions de ce décideur, on peut aisément présumer que le législateur a voulu que celui-ci puisse fonctionner en faisant le moins possible l'objet d'une intervention judiciaire. Toutefois, étant donné que le contrôle judiciaire bénéficie de la protection de l'art. 96 de la *Loi constitutionnelle de 1867*, le législateur ne peut soustraire le processus décisionnel administratif à tout examen judiciaire : *Dunsmuir*, par. 31; *Crevier c. Procureur général du Québec*, [1981] 2 R.C.S. 220, p. 236-237; *U.E.S., Local 298 c. Bibeault*, [1988] 2 R.C.S. 1048, p. 1090. Il n'en demeure pas moins que le respect de ces choix d'organisation institutionnelle de la part du législateur oblige la cour de révision à adopter une attitude de retenue lors du contrôle judiciaire.

[25] Depuis plusieurs années, la jurisprudence de notre Cour évolue vers une reconnaissance du fait que la norme de la décision raisonnable devrait être le point de départ du contrôle judiciaire d'une décision administrative. En effet, la présomption d'application de la norme de la décision raisonnable est déjà une caractéristique bien établie de l'analyse relative à la norme de contrôle applicable dans les cas où le décideur administratif interprète sa loi constitutive : voir *Alberta Teachers*, par. 30; *Saguenay*, par. 46; *Edmonton East*, par. 22. À notre avis, il y a maintenant lieu d'affirmer que chaque fois qu'une cour examine une décision administrative, elle doit partir de la présomption que la norme de contrôle applicable à l'égard de tous les aspects de cette décision est celle de la décision raisonnable. Si cette

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presumption also applies more broadly to other aspects of its decision.

[26] Before turning to an explanation of how the presumption of reasonableness review may be rebutted, we believe it is desirable to clarify one aspect of the conceptual basis for this presumption. Since *Canadian Union of Public Employees, Local 963 v. New Brunswick Liquor Corp.*, [1979] 2 S.C.R. 227 ("*C.U.P.E.*"), the central rationale for applying a deferential standard of review in administrative law has been a respect for the legislature's institutional design choice to delegate certain matters to non-judicial decision makers through statute: *C.U.P.E.*, at pp. 235-36. However, this Court has subsequently identified a number of other justifications for applying the reasonableness standard, some of which have taken on influential roles in the standard of review analysis at various times.

[27] In particular, the Court has described one rationale for applying the reasonableness standard as being the relative expertise of administrative decision makers with respect to the questions before them: see, e.g., *C.U.P.E.*, at p. 236; *Pushpanathan v. Canada (Minister of Citizenship and Immigration)*, [1998] 1 S.C.R. 982, at paras. 32-35; *Pezim v. British Columbia (Superintendent of Brokers)*, [1994] 2 S.C.R. 557, at pp. 591-92; *Canada (Director of Investigation and Research) v. Southam Inc.*, [1997] 1 S.C.R. 748, at paras. 50-53; *Dunsmuir*, at para. 49, quoting D. J. Mullan, "Establishing the Standard of Review: The Struggle for Complexity?" (2004), 17 *C.J.A.L.P.* 59, at p. 93; see also *Dunsmuir*, at para. 68. However, this Court's jurisprudence has sometimes been deeply divided on the question of what expertise entails in the administrative context, how it should be assessed and how it should inform the standard of review analysis: see, e.g., *Khosa*, at paras. 23-25, per Binnie J. for the majority, compared to paras. 93-96, per Rothstein J., concurring in the result; *Edmonton East*, at para. 33, per Karakatsanis J. for the majority, compared to paras. 81-86, per Côté and Brown JJ., dissenting. In the era of what was known as the "pragmatic and functional" approach,

présomption vise l'interprétation de sa loi habilitante par le décideur administratif, elle s'applique aussi de façon plus générale aux autres aspects de sa décision.

[26] Avant d'expliquer comment la présomption d'application de la norme de la décision raisonnable peut être réfutée, nous estimons qu'il est souhaitable de clarifier un aspect du fondement conceptuel de cette présomption. Depuis l'arrêt *Syndicat canadien de la Fonction publique, section locale 963 c. Société des alcools du Nouveau-Brunswick*, [1979] 2 R.C.S. 227 (« *S.C.F.P.* »), la principale raison d'être de la norme de contrôle fondée sur la déférence en droit administratif est le respect du choix d'organisation institutionnelle du législateur consistant à déléguer certaines questions à des décideurs non judiciaires par voie législative : *S.C.F.P.*, p. 235-236. Toutefois, la Cour a par la suite établi un certain nombre d'autres raisons justifiant l'application de la norme de la décision raisonnable, dont certaines ont influencé l'analyse relative à la norme de contrôle à divers moments.

[27] Plus précisément, la Cour a retenu que l'expertise relative du décideur administratif à l'égard des questions qui lui sont soumises est un motif justifiant l'application de la norme de la décision raisonnable : voir, p. ex., *S.C.F.P.*, p. 236; *Pushpanathan c. Canada (Ministre de la Citoyenneté et de l'Immigration)*, [1998] 1 R.C.S. 982, par. 32-35; *Pezim c. Colombie-Britannique (Superintendent of Brokers)*, [1994] 2 R.C.S. 557, p. 591-592; *Canada (Directeur des enquêtes et recherches) c. Southam Inc.*, [1997] 1 R.C.S. 748, par. 50-53; *Dunsmuir*, par. 49, citant D. J. Mullan, « Establishing the Standard of Review : The Struggle for Complexity? » (2004), 17 *R.C.D.A.P.* 59, p. 93; voir également *Dunsmuir*, par. 68. Mais la jurisprudence de la Cour a parfois souffert de profondes divisions sur l'impact de la notion d'expertise dans le contexte administratif, sur la façon dont elle devrait être appréciée et sur la manière dont elle devrait guider l'analyse relative à la norme de contrôle : voir, p. ex., *Khosa*, par. 23-25, le juge Binnie au nom de la majorité, comparativement aux par. 93-96, le juge Rothstein, motifs concordants quant au résultat; *Edmonton East*, par. 33, la juge Karakatsanis au nom de la majorité, comparativement aux par. 81-86, les juges Côté et Brown, dissidents.

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which was first set out in *Bibeault*, a decision maker's expertise relative to that of the reviewing court was one of the key contextual factors said to indicate legislative intent with respect to the standard of review, but the decision maker was not presumed to have relative expertise. Instead, whether a decision maker had greater expertise than the reviewing court was assessed in relation to the specific question at issue and on the basis of a contextual analysis that could incorporate factors such as the qualification of an administrative body's members, their experience in a particular area and their involvement in policy making: see, e.g., *Pezim*, at pp. 591-92; *Southam*, at paras. 50-53; *Dr. Q v. College of Physicians and Surgeons of British Columbia*, 2003 SCC 19, [2003] 1 S.C.R. 226, at paras. 28-29; *Canada (Deputy Minister of National Revenue) v. Mattel Canada Inc.*, 2001 SCC 36, [2001] 2 S.C.R. 100, at paras. 28-32; *Moreau-Bérubé v. New Brunswick (Judicial Council)*, 2002 SCC 11, [2002] 1 S.C.R. 249, at para. 50.

[28] Unfortunately, this contextual analysis proved to be unwieldy and offered limited practical guidance for courts attempting to assess an administrative decision maker's relative expertise. More recently, the dominant approach in this Court has been to accept that expertise simply inheres in an administrative body by virtue of the specialized function designated for it by the legislature: *Edmonton East*, at para. 33. However, if administrative decision makers are understood to possess specialized expertise on all questions that come before them, the concept of expertise ceases to assist a reviewing court in attempting to distinguish questions for which applying the reasonableness standard is appropriate from those for which it is not.

[29] Of course, the fact that the specialized role of administrative decision makers lends itself to the development of expertise and institutional experience is not the only reason that a legislature may choose to delegate decision-making authority. Over the years, the Court has pointed to a number of other compelling rationales for the legislature to delegate

À l'ère de ce que l'on appelait l'approche « pragmatique et fonctionnelle », énoncée pour la première fois dans l'arrêt *Bibeault*, l'expertise du décideur par rapport à celle de la cour de révision constituait l'un des principaux facteurs contextuels censés indiquer l'intention du législateur concernant la norme de contrôle, mais l'expertise relative du décideur n'était pas présumée. La question de savoir si le décideur avait une plus grande expertise que la cour de révision était plutôt appréciée en fonction de la question précise en litige et d'une analyse contextuelle pouvant incorporer des facteurs comme les compétences des membres de l'organisme administratif, leur expérience dans un domaine particulier et leur participation à l'élaboration des politiques : voir, p. ex., *Pezim*, p. 591-592; *Southam*, par. 50-53; *Dr Q c. College of Physicians and Surgeons of British Columbia*, 2003 CSC 19, [2003] 1 R.C.S. 226, par. 28-29; *Canada (Sous-ministre du Revenu national) c. Mattel Canada Inc.*, 2001 CSC 36, [2001] 2 R.C.S. 100, par. 28-32; *Moreau-Bérubé c. Nouveau-Brunswick (Conseil de la magistrature)*, 2002 CSC 11, [2002] 1 R.C.S. 249, par. 50.

[28] Malheureusement, l'analyse contextuelle s'est révélée complexe et d'utilité limitée pour donner une orientation pratique aux cours de justice qui tentent d'évaluer l'expertise relative du décideur administratif. Plus récemment, la méthode prédominante adoptée par notre Cour a consisté à reconnaître que l'expertise est simplement inhérente à un organisme administratif en raison des fonctions spécialisées que lui a confiées le législateur : *Edmonton East*, par. 33. Or, s'il est dorénavant tenu pour acquis que le décideur administratif possède une expertise spécialisée en ce qui concerne l'ensemble des questions dont il est saisi, la notion d'expertise n'aide plus la cour de révision à distinguer les questions qui commandent l'application de la norme de la décision raisonnable de celles qui ne la commandent pas.

[29] Bien sûr, le rôle spécialisé du décideur administratif qui permet à celui-ci d'approfondir son expertise et son expérience institutionnelle n'est pas la seule raison pour laquelle le législateur peut choisir de lui déléguer un pouvoir décisionnel. Au fil des ans, la Cour a ainsi souligné plusieurs autres raisons convaincantes justifiant la délégation de l'administration d'un régime

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the administration of a statutory scheme to a particular administrative decision maker. These rationales have included the decision maker's proximity and responsiveness to stakeholders, ability to render decisions promptly, flexibly and efficiently, and ability to provide simplified and streamlined proceedings intended to promote access to justice.

[30] While specialized expertise and these other rationales may all be reasons for a legislature to delegate decision-making authority, a reviewing court need not evaluate which of these rationales apply in the case of a particular decision maker in order to determine the standard of review. Instead, in our view, it is the *very fact* that the legislature has chosen to delegate authority which justifies a default position of reasonableness review. The Court has in fact recognized this basis for applying the reasonableness standard to administrative decisions in the past. In *Khosa*, for example, the majority understood *Dunsmuir* to stand for the proposition that "with or without a privative clause, a measure of deference has come to be accepted as appropriate where a particular decision had been allocated to an administrative decision-maker rather than to the courts": para. 25. More recently, in *Edmonton East*, Karakatsanis J. explained that a presumption of reasonableness review "respects the principle of legislative supremacy and the choice made to delegate decision making to a tribunal, rather than the courts": para. 22. And in *CHRC*, Gascon J. explained that "the fact that the legislature has allocated authority to a decision maker other than the courts is itself an indication that the legislature intended deferential review": para. 50. In other words, respect for this institutional design choice and the democratic principle, as well as the need for courts to avoid "undue interference" with the administrative decision maker's discharge of its functions, is what justifies the presumptive application of the reasonableness standard: *Dunsmuir*, at para. 27.

législatif à un décideur en particulier. Mentionnons la proximité des décideurs et des parties intéressées ainsi que la réceptivité envers ces dernières; la capacité des décideurs de trancher de manière rapide, souple et efficace; et leur faculté d'alléger et de simplifier la procédure pour favoriser ainsi l'accès à la justice.

[30] Si l'expertise spécialisée et ces autres considérations peuvent toutes justifier la délégation du pouvoir décisionnel, une cour de révision n'est pas tenue d'établir laquelle de ces considérations s'applique dans le cas d'un décideur donné afin de déterminer la norme de contrôle applicable. Nous sommes plutôt d'avis que c'est *le fait même* que le législateur choisit de déléguer le pouvoir décisionnel qui justifie l'application par défaut de la norme de la décision raisonnable. La Cour a de fait déjà reconnu ce fondement de l'application de la norme de la décision raisonnable aux décisions administratives. Dans l'arrêt *Khosa*, par exemple, les juges majoritaires ont interprété l'arrêt *Dunsmuir* comme appuyant la proposition selon laquelle, « sans égard à l'existence d'une clause privative, il est maintenant admis qu'une certaine déférence s'impose lorsqu'une décision particulière a été confiée à un décideur administratif plutôt qu'aux tribunaux judiciaires » : par. 25. Plus récemment, dans l'arrêt *Edmonton East*, la juge Karakatsanis a expliqué que la présomption de contrôle judiciaire selon la norme de la décision raisonnable « respecte le principe de la suprématie législative et la décision de déléguer le pouvoir décisionnel à un tribunal administratif plutôt qu'aux cours de justice » : par. 22. Qui plus est, dans l'arrêt *CCDP*, le juge Gascon a précisé que « le fait que le législateur a confié certains pouvoirs à un décideur administratif plutôt qu'aux tribunaux judiciaires porte à croire qu'il avait l'intention que la déférence s'impose » : par. 50. Autrement dit, la présomption d'application de la norme de la décision raisonnable se justifie à la fois par le respect de ce choix en matière d'organisation institutionnelle et du principe démocratique, ainsi que par la nécessité que les cours de justice évitent « toute immixtion injustifiée » dans l'exercice par le décideur administratif de ses fonctions : *Dunsmuir*, par. 27.

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[31] We wish to emphasize that because these reasons adopt a presumption of reasonableness as the starting point, expertise is no longer relevant to a determination of the standard of review as it was in the contextual analysis. However, we are not doing away with the role of expertise in administrative decision making. This consideration is simply folded into the new starting point and, as explained below, expertise remains a relevant consideration in conducting reasonableness review.

[32] That being said, our starting position that the applicable standard of review is reasonableness is not incompatible with the rule of law. However, because this approach is grounded in respect for legislative choice, it also requires courts to give effect to clear legislative direction that a different standard was intended. Similarly, a reviewing court must be prepared to derogate from the presumption of reasonableness review where respect for the rule of law requires a singular, determinate and final answer to the question before it. Each of these situations will be discussed in turn below.

B. *Derogation From the Presumption of Reasonableness Review on the Basis of Legislative Intent*

[33] This Court has described respect for legislative intent as the "polar star" of judicial review: *C.U.P.E. v. Ontario (Minister of Labour)*, 2003 SCC 29, [2003] 1 S.C.R. 539, at para. 149. This description remains apt. The presumption of reasonableness review discussed above is intended to give effect to the legislature's choice to leave certain matters with administrative decision makers rather than the courts. It follows that this presumption will be rebutted where a legislature has indicated that a different standard should apply. The legislature can do so in two ways. First, it may explicitly prescribe through statute what standard courts should apply when reviewing decisions of a particular administrative decision maker. Second, it may direct that

[31] Puisque nous retenons dans les présents motifs la présomption d'application de la norme de la décision raisonnable en tant que point de départ, nous tenons à préciser que l'expertise n'est plus pertinente pour déterminer la norme de contrôle applicable, comme c'était le cas dans l'analyse contextuelle. Nous n'enlevons toutefois pas à l'expertise la place qu'elle occupe dans le processus décisionnel administratif. Cette considération est tout simplement incorporée au nouveau point de départ et, comme nous l'expliquons plus loin, l'expertise demeure pertinente lors de l'exercice du contrôle judiciaire selon la norme de la décision raisonnable.

[32] Cela dit, notre position de départ voulant que la norme de contrôle applicable soit celle de la décision raisonnable n'est pas inconciliable avec la primauté du droit. Puisque cette approche repose sur le respect du choix fait par le législateur, les cours de justice doivent aussi donner effet aux indications expresses de ce dernier sur l'application d'une norme de contrôle différente. De la même manière, la cour de révision doit être prête à déroger à la présomption d'application de la norme de la décision raisonnable dans les cas où le respect de la primauté du droit exige une réponse unique, décisive et définitive à la question dont elle est saisie. Nous examinons chacune de ces situations à tour de rôle.

B. *La dérogation à la présomption d'application de la norme de la décision raisonnable compte tenu de l'intention du législateur*

[33] La Cour a écrit que le respect de l'intention du législateur « doit nous guider » en matière de contrôle judiciaire : *S.C.F.P. c. Ontario (Ministre du Travail)*, 2003 CSC 29, [2003] 1 R.C.S. 539, par. 149. Cette position demeure pertinente. La présomption relative à l'application de la norme de la décision raisonnable décrite ci-dessus a pour objet de donner effet à la volonté du législateur de s'en remettre, pour certaines choses, à un décideur administratif plutôt qu'aux cours de justice. Cette présomption peut donc être réfutée si le législateur prévoit l'application d'une norme de contrôle différente, ce qu'il peut faire de deux façons. Premièrement, le législateur peut prescrire expressément, dans une loi, la norme de contrôle applicable aux décisions d'un décideur administratif

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derogation from the presumption of reasonableness review is appropriate by providing for a statutory appeal mechanism from an administrative decision maker to a court, thereby signalling the application of appellate standards.

(1) Legislated Standards of Review

[34] Any framework rooted in legislative intent must, to the extent possible, respect clear statutory language that prescribes the applicable standard of review. This Court has consistently affirmed that legislated standards of review should be given effect: see, e.g., *R. v. Owen*, 2003 SCC 33, [2003] 1 S.C.R. 779, at paras. 31-32; *Khosa*, at paras. 18-19; *British Columbia (Workers' Compensation Board) v. Figliola*, 2011 SCC 52, [2011] 3 S.C.R. 422, at para. 20; *Moore v. British Columbia (Education)*, 2012 SCC 61, [2012] 3 S.C.R. 360, at para. 55; *McCormick v. Fasken Martineau DuMoulin LLP*, 2014 SCC 39, [2014] 2 S.C.R. 108, at para. 16; *British Columbia (Workers' Compensation Appeal Tribunal) v. Fraser Health Authority*, 2016 SCC 25, [2016] 1 S.C.R. 587, at paras. 8 and 29; *British Columbia Human Rights Tribunal v. Schrenk*, 2017 SCC 62, [2017] 2 S.C.R. 795, at para. 28.

[35] It follows that where a legislature has indicated that courts are to apply the standard of correctness in reviewing certain questions, that standard must be applied. In British Columbia, the legislature has established the applicable standard of review for many tribunals by reference to the *Administrative Tribunals Act*, S.B.C. 2004, c. 45: see ss. 58 and 59. For example, it has provided that the standard of review applicable to decisions on questions of statutory interpretation by the B.C. Human Rights Tribunal is to be correctness: *ibid.*, s. 59(1); *Human Rights Code*, R.S.B.C. 1996, c. 210, s. 32. We continue to be of the view that where the legislature has indicated the applicable standard of review, courts are bound to respect that designation, within the limits imposed by the rule of law.

en particulier. Deuxièmement, le législateur peut indiquer qu'une dérogation à la présomption de contrôle selon la norme de la décision raisonnable est de mise en prévoyant un mécanisme d'appel à l'encontre d'un décideur administratif devant une cour de justice, ce qui dénote que les normes générales en matière d'appel trouvent application.

(1) Les normes de contrôle établies par voie législative

[34] Tout cadre d'analyse fondé sur l'intention du législateur doit respecter, dans la mesure du possible, les dispositions législatives claires qui prescrivent la norme de contrôle applicable. Notre Cour a régulièrement affirmé qu'il faut donner effet aux normes de contrôle prescrites par la loi : voir, p. ex., *R. c. Owen*, 2003 CSC 33, [2003] 1 R.C.S. 779, par. 31-32; *Khosa*, par. 18-19; *Colombie-Britannique (Workers' Compensation Board) c. Figliola*, 2011 CSC 52, [2011] 3 R.C.S. 422, par. 20; *Moore c. Colombie-Britannique (Éducation)*, 2012 CSC 61, [2012] 3 R.C.S. 360, par. 55; *McCormick c. Fasken Martineau DuMoulin S.E.N.C.R.L./s.r.l.*, 2014 CSC 39, [2014] 2 R.C.S. 108, par. 16; *Colombie-Britannique (Workers' Compensation Appeal Tribunal) c. Fraser Health Authority*, 2016 CSC 25, [2016] 1 R.C.S. 587, par. 8 et 29; *British Columbia Human Rights Tribunal c. Schrenk*, 2017 CSC 62, [2017] 2 R.C.S. 795, par. 28.

[35] Ainsi, lorsque le législateur indique que les cours de justice ont l'obligation d'appliquer la norme de la décision correcte lors du contrôle de certaines questions, c'est la norme qu'il convient alors d'appliquer. En Colombie-Britannique, la législature a fixé la norme de contrôle applicable pour de nombreux tribunaux administratifs en se fondant sur l'*Administrative Tribunals Act*, S.B.C. 2004, c. 45 : voir art. 58 et 59. Par exemple, elle a prévu que les questions d'interprétation des lois dont est saisi le tribunal des droits de la personne de la Colombie-Britannique doivent être contrôlées selon la norme de la décision correcte : *ibid.*, par. 59(1); *Human Rights Code*, R.S.B.C. 1996, c. 210, art. 32. Nous sommes toujours d'avis que, dans les cas où le législateur énonce la norme de contrôle applicable, les cours de justice sont tenues au respect de celle-ci, dans les limites qu'impose la primauté du droit.

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(2) Statutory Appeal Mechanisms

[36] We have reaffirmed that, to the extent possible, the standard of review analysis requires courts to give effect to the legislature's institutional design choices to delegate authority through statute. In our view, this principled position also requires courts to give effect to the legislature's intent, signalled by the presence of a statutory appeal mechanism from an administrative decision to a court, that the court is to perform an appellate function with respect to that decision. Just as a legislature may, within constitutional limits, insulate administrative decisions from judicial interference, it may also choose to establish a regime "which does not exclude the courts but rather makes them part of the enforcement machinery": *Seneca College of Applied Arts and Technology v. Bhadauria*, [1981] 2 S.C.R. 181, at p. 195. Where a legislature has provided that parties may appeal from an administrative decision to a court, either as of right or with leave, it has subjected the administrative regime to appellate oversight and indicated that it expects the court to scrutinize such administrative decisions on an appellate basis. This expressed intention necessarily rebuts the blanket presumption of reasonableness review, which is premised on giving effect to a legislature's decision to leave certain issues with a body other than a court. This intention should be given effect. As noted by the intervener Attorney General of Quebec in her factum, [TRANSLATION] "[t]he requirement of deference must not sterilize such an appeal mechanism to the point that it changes the nature of the decision-making process the legislature intended to put in place": para. 2.

[37] It should therefore be recognized that, where the legislature has provided for an appeal from an administrative decision to a court, a court hearing such an appeal is to apply appellate standards of review to the decision. This means that the applicable standard is to be determined with reference to the nature of the question and to this Court's jurisprudence on appellate standards of review. Where, for example, a court is hearing an appeal from an administrative

(2) Les mécanismes d'appel prévus par la loi

[36] Nous avons réaffirmé que, dans l'analyse relative à la norme de contrôle, les cours de justice devaient autant que possible respecter les choix d'organisation institutionnelle du législateur consistant à déléguer certaines questions par voie législative. À notre avis, compte tenu de cette position de principe, les cours de justice doivent aussi donner effet à l'intention du législateur qui se manifeste par la présence d'un mécanisme d'appel à l'encontre d'une décision administrative et qui prévoit l'exercice d'une fonction d'appel au regard d'une telle décision. De la même manière que le législateur peut, dans le respect des limites fixées par la Constitution, mettre des décisions administratives à l'abri d'une intervention judiciaire, il peut également choisir d'établir un régime qui, « loin d'exclure les cours, les intègre dans le mécanisme d'application prévu » : *Seneca College of Applied Arts and Technology c. Bhadauria*, [1981] 2 R.C.S. 181, p. 195. Lorsqu'il accorde aux parties la possibilité de porter en appel, de plein droit ou sur autorisation, une décision administrative devant une cour de justice, le législateur assujettit le régime administratif à une compétence d'appel et indique qu'il s'attend à ce que la cour vérifie attentivement cette décision lors d'un processus d'appel. Cette volonté expresse réfute forcément la présomption générale d'application de la norme de la décision raisonnable fondée sur l'intention de respecter le choix du législateur de renvoyer certaines questions à un organisme autre qu'une cour de justice. Il y a lieu de donner effet à cette volonté. Comme le fait observer l'intervenante la procureure générale du Québec dans son mémoire, « [l]'obligation de déférence ne doit pas stériliser un tel mécanisme d'appel, jusqu'à dénaturer le processus décisionnel que le législateur voulait mettre en place » : par. 2.

[37] Il convient donc de reconnaître que, lorsque le législateur prévoit un appel à l'encontre d'une décision administrative devant une cour de justice, la cour saisie de l'appel doit recourir aux normes applicables en appel pour réviser la décision. Ainsi, la norme de contrôle applicable doit être déterminée eu égard à la nature de la question et à la jurisprudence de notre Cour en la matière. Par exemple, lorsqu'une cour de justice entend l'appel d'une décision

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decision, it would, in considering questions of law, including questions of statutory interpretation and those concerning the scope of a decision maker's authority, apply the standard of correctness in accordance with *Housen v. Nikolaisen*, 2002 SCC 33, [2002] 2 S.C.R. 235, at para. 8. Where the scope of the statutory appeal includes questions of fact, the appellate standard of review for those questions is palpable and overriding error (as it is for questions of mixed fact and law where the legal principle is not readily extricable): see *Housen*, at paras. 10, 19 and 26-37. Of course, should a legislature intend that a different standard of review apply in a statutory appeal, it is always free to make that intention known by prescribing the applicable standard through statute.

[38] We acknowledge that giving effect to statutory appeal mechanisms in this way departs from the Court's recent jurisprudence. However, after careful consideration, we are of the view that this shift is necessary in order to bring coherence and conceptual balance to the standard of review analysis and is justified by a weighing of the values of certainty and correctness: *Craig*, at para. 27. Our conclusion is based on the following considerations.

[39] First, there has been significant judicial and academic criticism of this Court's recent approach to statutory appeal rights: see, e.g., Y.-M. Morissette, "What is a 'reasonable decision'?" (2018), 31 *C.J.A.L.P.* 225, at p. 244; the Hon. J. T. Robertson, *Administrative Deference: The Canadian Doctrine that Continues to Disappoint* (April 18, 2018) (online), at p. 8; the Hon. D. Stratas, "The Canadian Law of Judicial Review: A Plea for Doctrinal Coherence and Consistency" (2016), 42 *Queen's L.J.* 27, at p. 33; Daly, at pp. 541-42; *Québec (Procureure générale) v. Montréal (Ville)*, 2016 QCCA 2108, 17 Admin. L.R. (6th) 328, at paras. 36-46; *Bell Canada v. 7262591 Canada Ltd.*, 2018 FCA 174, 428 D.L.R. (4th) 311, at paras. 190-92, per Nadon J.A., concurring, and at paras. 66 and 69-72, per Rennie J.A., dissenting; *Garneau Community League v. Edmonton (City)*, 2017 ABCA 374, 60 Alta. L.R. (6th) 1, at paras. 91 and 93-95, per Slatter J.A., concurring; *Nova Scotia (Attorney General) v. S&D Smith Central*

administrative, elle se prononcera sur des questions de droit, touchant notamment à l'interprétation législative et à la portée de la compétence du décideur, selon la norme de la décision correcte conformément à l'arrêt *Housen c. Nikolaisen*, 2002 CSC 33, [2002] 2 R.C.S. 235, par. 8. Si l'appel prévu par la loi porte notamment sur des questions de fait, la norme de contrôle sera celle de l'erreur manifeste et déterminante (applicable également à l'égard des questions mixtes de fait et de droit en l'absence d'un principe juridique facilement isolable) : voir *Housen*, par. 10, 19 et 26-37. Évidemment, si le législateur entend prévoir l'application en appel d'une autre norme de contrôle, il lui est toujours loisible d'exprimer son intention en énonçant dans la loi la norme de contrôle applicable.

[38] Il est vrai que donner un tel sens aux mécanismes d'appel prévus par la loi s'écarte de la jurisprudence récente de notre Cour. Cependant, après un examen attentif, nous estimons que ce virage s'impose afin d'apporter uniformité et équilibre conceptuel à l'analyse relative à la norme de contrôle. En outre, cette approche est justifiée par la mise en balance des valeurs de la certitude et de la justesse : *Craig*, par. 27. Notre conclusion repose sur les considérations suivantes.

[39] D'abord, d'importantes critiques judiciaires et doctrinales ont été formulées au sujet de cette conception somme toute récente que notre Cour s'est faite des droits d'appel accordés par la loi : voir, p. ex., Y.-M. Morissette, « What is a "reasonable decision"? » (2018), 31 *R.C.D.A.P.* 225, p. 244; l'honorable J. T. Robertson, *Administrative Deference : The Canadian Doctrine that Continues to Disappoint* (18 avril 2018) (en ligne), p. 8; l'honorable D. Stratas, « The Canadian Law of Judicial Review : A Plea for Doctrinal Coherence and Consistency » (2016), 42 *Queen's L.J.* 27, p. 33; Daly, p. 541-542; *Québec (Procureure générale) c. Montréal (Ville)*, 2016 QCCA 2108, 17 Admin. L.R. (6th) 328, par. 36-46; *Bell Canada c. 7262591 Canada Ltd.*, 2018 CAF 174, par. 190-192 (CanLII), motifs concordants du juge Nadon, et par. 66 et 69-72, motifs dissidents du juge Rennie; *Garneau Community League c. Edmonton (City)*, 2017 ABCA 374, 60 Alta. L.R. (6th) 1, par. 91 et 93-95, motifs

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Supplies Limited, 2019 NSCA 22, at paras. 250, 255-64 and 274-302 (CanLII), per Beveridge J.A., dissenting; *Atlantic Mining NS Corp. (D.D.V. Gold Limited) v. Oakley*, 2019 NSCA 14, at paras. 9-14 (CanLII). These critiques seize on the inconsistency inherent in a standard of review framework based on legislative intent that otherwise declines to give meaning to an express statutory right of appeal. This criticism observes that legislative choice is not one-dimensional; rather, it pulls in two directions. While a legislative choice to delegate to an administrative decision maker grounds a presumption of reasonableness on the one hand, a legislative choice to enact a statutory right of appeal signals an intention to ascribe an appellate role to reviewing courts on the other hand.

[40] This Court has in the past held that the existence of significant and valid judicial, academic and other criticism of its jurisprudence may justify reconsideration of a precedent: *Craig*, at para. 29; *R. v. Robinson*, [1996] 1 S.C.R. 683, at paras. 35-41. This consideration applies in the instant case. In particular, the suggestion that the recent treatment of statutory rights of appeal represents a departure from the conceptual basis underpinning the standard of review framework is itself a compelling reason to re-examine the current approach: *Khosa*, at para. 87, per Rothstein J., concurring in the result.

[41] Second, there is no satisfactory justification for the recent trend in this Court's jurisprudence to give no effect to statutory rights of appeal in the standard of review analysis absent exceptional wording: see *Tervita Corp. v. Canada (Commissioner of Competition)*, 2015 SCC 3, [2015] 1 S.C.R. 161, at paras. 35-39. Indeed, this approach is itself a departure from earlier jurisprudence: the Hon. J. T. Robertson, "Judicial Deference to Administrative Tribunals: A Guide to 60 Years of Supreme Court Jurisprudence" (2014), 66 *S.C.L.R.* (2d) 1, at pp. 91-93. Under the former "pragmatic and functional" approach to determining the applicable standard of review, the existence of a privative clause or a statutory right of appeal was one of four contextual factors that a court would

concordants du juge Slatter; *Nova Scotia (Attorney General) c. S&D Smith Central Supplies Limited*, 2019 NSCA 22, par. 250, 255-264 et 274-302 (CanLII), motifs dissidents du juge Beveridge; *Atlantic Mining NS Corp. (D.D.V. Gold Limited) c. Oakley*, 2019 NSCA 14, par. 9-14 (CanLII). Ces critiques insistent sur l'incohérence inhérente à un cadre d'analyse de la norme de contrôle fondé sur l'intention du législateur qui refuse par ailleurs de donner un sens à un droit d'appel conféré expressément par la loi. D'après ces critiques, le choix du législateur n'est pas unidimensionnel; il pointe plutôt vers deux directions opposées. Si, d'un côté, le choix du législateur de déléguer des pouvoirs à un décideur administratif fonde une présomption d'application de la norme de la décision raisonnable, de l'autre côté, son choix de créer dans la loi un droit d'appel manifeste une intention d'attribuer un rôle de tribunal d'appel aux cours de révision.

[40] Notre Cour a déjà jugé que l'existence d'importantes critiques valables, notamment judiciaires et doctrinales, peut justifier le réexamen d'un précédent : *Craig*, par. 29; *R. c. Robinson*, [1996] 1 R.C.S. 683, par. 35-41. Cette considération s'applique en l'espèce. Plus précisément, l'affirmation selon laquelle l'examen des droits d'appel conférés par la loi représente une rupture avec le fondement conceptuel qui sous-tend le cadre d'analyse de la norme de contrôle est en soi une raison convaincante de revoir l'approche actuelle : *Khosa*, par. 87, le juge Rothstein, motifs concordants quant au résultat.

[41] Ensuite, rien ne justifie de façon satisfaisante la tendance récente de notre Cour de ne pas tenir compte des droits d'appel conférés par la loi sauf en présence d'un libellé exceptionnel : voir *Tervita Corp. c. Canada (Commissaire de la concurrence)*, 2015 CSC 3, [2015] 1 R.C.S. 161, par. 35-39. En effet, la Cour rompt ainsi avec la jurisprudence antérieure : l'honorable J. T. Robertson, « Judicial Deference to Administrative Tribunals : A Guide to 60 Years of Supreme Court Jurisprudence » (2014), 66 *S.C.L.R.* (2d) 1, p. 91-93. Selon l'ancienne approche « pragmatique et fonctionnelle » adoptée pour déterminer la norme de contrôle applicable, l'existence d'une clause privative ou d'un droit d'appel prévu par la loi faisait partie des quatre facteurs contextuels

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consider in order to determine the standard that the legislature intended to apply to a particular decision. Although a statutory appeal clause was not determinative, it was understood to be a key factor indicating that the legislature intended that a less deferential standard of review be applied: see, e.g., *Pezim*, at pp. 589-92; *British Columbia Telephone Co. v. Shaw Cable Systems (B.C.) Ltd.*, [1995] 2 S.C.R. 739, at paras. 28-31; *Southam*, at paras. 30-32, 46 and 54-55; *Pushpanathan*, at paras. 30-31; *Dr. Q*, at para. 27; *Mattel*, at paras. 26-27; *Law Society of New Brunswick v. Ryan*, 2003 SCC 20, [2003] 1 S.C.R. 247, at paras. 21 and 27-29; *Barrie Public Utilities v. Canadian Cable Television Assn.*, 2003 SCC 28, [2003] 1 S.C.R. 476, at para. 11; *Monsanto Canada Inc. v. Ontario (Superintendent of Financial Services)*, 2004 SCC 54, [2004] 3 S.C.R. 152, at para. 7.

[42] The Court did indeed sometimes find that, even in a statutory appeal, a deferential standard of review was warranted for the legal findings of a decision maker that lay at the heart of the decision maker's expertise: see, e.g., *Pezim*. In other instances, however, the Court concluded that the existence of a statutory appeal mechanism and the fact that the decision maker did not have greater expertise than a court on the issue being considered indicated that correctness was the appropriate standard, including on matters involving the interpretation of the administrative decision maker's home statute: see, e.g., *Mattel*, at paras. 26-33; *Barrie Public Utilities*, at paras. 9-19; *Monsanto*, at paras. 6-16.

[43] Yet as, in *Dunsmuir*, *Alberta Teachers*, *Edmonton East* and subsequent cases, the standard of review analysis was simplified and shifted from a contextual analysis to an approach more focused on categories, statutory appeal mechanisms ceased to play a role in the analysis. Although this simplification of the standard of review analysis may have been a laudable change, it did not justify ceasing to give *any* effect to statutory appeal mechanisms. *Dunsmuir* itself provides little guidance on the rationale for this change. The majority in *Dunsmuir* was silent on the role of a statutory right of appeal in determining the standard of review, and did not refer to the prior treatment of statutory rights

dont la cour de justice tenait compte pour cerner la norme que le législateur entendait appliquer à une décision particulière. Quoiqu'elle ne constituait pas un facteur déterminant, la disposition législative créant le droit d'appel était considérée comme un facteur clé témoignant de l'intention du législateur que les cours de justice appliquent une norme de contrôle moins déférente : voir, p. ex., *Pezim*, p. 589-592; *British Columbia Telephone Co. c. Shaw Cable Systems (B.C.) Ltd.*, [1995] 2 R.C.S. 739, par. 28-31; *Southam*, par. 30-32, 46 et 54-55; *Pushpanathan*, par. 30-31; *Dr Q*, par. 27; *Mattel*, par. 26-27; *Barreau du Nouveau-Brunswick c. Ryan*, 2003 CSC 20, [2003] 1 R.C.S. 247, par. 21 et 27-29; *Barrie Public Utilities c. Assoc. canadienne de télévision par câble*, 2003 CSC 28, [2003] 1 R.C.S. 476, par. 11; *Monsanto Canada Inc. c. Ontario (Surintendant des services financiers)*, 2004 CSC 54, [2004] 3 R.C.S. 152, par. 7.

[42] La Cour a certes statué parfois que, même dans le cas d'un appel prévu par la loi, les conclusions juridiques qui touchent directement à l'expertise du décideur commandaient une norme de contrôle empreinte de déférence : voir, p. ex., *Pezim*. Cependant, dans d'autres cas, la Cour a conclu que l'existence d'un mécanisme d'appel prévu par la loi et le fait que le décideur n'avait pas une plus grande expertise que les cours à l'égard de la question étudiée indiquaient que la norme de contrôle applicable était celle de la décision correcte, notamment en matière d'interprétation de la loi constitutive du décideur administratif : voir, p. ex., *Mattel*, par. 26-33; *Barrie Public Utilities*, par. 9-19; *Monsanto*, par. 6-16.

[43] Or, dans les arrêts *Dunsmuir*, *Alberta Teachers*, *Edmonton East* et la jurisprudence subséquente, où la Cour a simplifié l'analyse relative à la norme de contrôle pour passer d'une approche contextuelle à une approche davantage orientée vers des catégories, les mécanismes d'appel prévus par la loi ont cessé de jouer un rôle dans l'analyse. Bien qu'elle ait pu s'avérer louable, cette simplification de l'analyse relative à la norme de contrôle ne justifie pas que l'on cesse de donner *quelque* effet que ce soit aux mécanismes d'appel prévus par la loi. L'arrêt *Dunsmuir* lui-même donne peu d'indications sur la raison d'être de ce changement. Les juges majoritaires dans cet arrêt n'ont rien dit sur le rôle

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of appeal under the pragmatic and functional approach.

[44] More generally, there is no convincing reason to presume that legislatures mean something entirely different when they use the word "appeal" in an administrative law statute than they do in, for example, a criminal or commercial law context. Accepting that the word "appeal" refers to the same type of procedure in all these contexts also accords with the presumption of consistent expression, according to which the legislature is presumed to use language such that the same words have the same meaning both within a statute and across statutes: R. Sullivan, *Sullivan on the Construction of Statutes* (6th ed. 2014), at p. 217. Accepting that the legislature intends an appellate standard of review to be applied when it uses the word "appeal" also helps to explain why many statutes provide for *both* appeal and judicial review mechanisms in different contexts, thereby indicating two roles for reviewing courts: see, e.g., *Federal Courts Act*, R.S.C. 1985, c. F-7, ss. 27 and 28. This offers further support for giving effect to statutory rights of appeal. Our colleagues' suggestion that our position in this regard "hinges" on what they call a "textualist argument" (at para. 246) is inaccurate.

[45] That there is no principled rationale for ignoring statutory appeal mechanisms becomes obvious when the broader context of those mechanisms is considered. The existence of a limited right of appeal, such as a right of appeal on questions of law or a right of appeal with leave of a court, does not preclude a court from considering other aspects of a decision in a judicial review proceeding. However, if the same standards of review applied regardless of whether a question was covered by the appeal provision, and regardless of whether an individual subject to an administrative decision was granted leave to appeal or applied for judicial review, the appeal provision would be completely redundant — contrary to the well-established principle that the legislature

que joue le droit d'appel accordé par la loi dans la détermination de la norme de contrôle applicable et n'ont pas parlé du traitement réservé autrefois aux droits d'appel de cette nature par l'approche pragmatique et fonctionnelle.

[44] De façon plus générale, il n'y a aucune raison convaincante de présumer que le législateur voulait que le mot « appel » revête un sens tout à fait différent dans une loi à caractère administratif que, par exemple, dans un contexte du droit criminel ou commercial. Accepter que le mot « appel » porte sur le même type de procédure dans tous ces contextes s'accorde également avec la présomption d'uniformité d'expression, selon laquelle le législateur est présumé employer des mots de telle sorte que les mêmes termes ont le même sens, dans une même loi ainsi que d'une loi à l'autre : R. Sullivan, *Sullivan on the Construction of Statutes* (6e éd. 2014), p. 217. Le fait de tenir pour acquis que le législateur entend par « appel » le recours à une norme de contrôle applicable en appel permet également d'expliquer pourquoi bon nombre de textes législatifs prévoient *à la fois* des mécanismes d'appel et de contrôle judiciaire dans différents contextes, conférant ainsi deux rôles possibles aux cours de révision : voir, p. ex., la *Loi sur les Cours fédérales*, L.R.C. 1985, c. F-7, art. 27 et 28. Cela vient renforcer l'idée qu'il est nécessaire de donner effet aux droits d'appel conférés par la loi. La suggestion de nos collègues que notre position à cet égard « repose » sur ce qu'elles appellent un « argument textuel » (par. 246) est inexacte.

[45] L'examen du contexte général des mécanismes d'appel prévus par la loi fait ressortir l'absence de justification rationnelle au fait de ne pas tenir compte de ceux-ci. Ainsi, l'existence d'un droit d'appel circonscrit, par exemple sur des questions de droit ou sur autorisation judiciaire, ne fait pas obstacle à l'examen d'autres éléments de la décision par voie de contrôle judiciaire. Par contre, si les mêmes normes de contrôle s'appliquaient, que la question en cause soit visée ou non par le droit d'appel ou que la personne faisant l'objet de la décision administrative ait obtenu ou non l'autorisation d'interjeter appel ou ait présenté ou non une demande de contrôle judiciaire, la disposition créant le droit d'appel serait alors tout à fait redondante. Or, cela serait contraire

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does not speak in vain: *Attorney General of Quebec v. Carrières Ste-Thérèse Ltée*, [1985] 1 S.C.R. 831, at p. 838.

[46] Finally, and most crucially, the appeals now before the Court have allowed for a comprehensive and considered examination of the standard of review analysis with the goal of remedying the conceptual and practical difficulties that have made this area of the law challenging for litigants and courts alike. To achieve this goal, the revised framework must, for at least two reasons, give effect to statutory appeal mechanisms. The first reason is conceptual. In the past, this Court has looked past an appeal clause primarily when the decision maker possessed greater relative expertise — what it called the "specialization of duties" principle in *Pezim*, at p. 591. But, as discussed above, the presumption of reasonableness review is no longer premised upon notions of relative expertise. Instead, it is now based on respect for the legislature's institutional design choice, according to which the authority to make a decision is vested in an administrative decision maker rather than in a court. It would be inconsistent with this conceptual basis for the presumption of reasonableness review to disregard clear indications that the legislature has intentionally chosen a more involved role for the courts. Just as recognizing a presumption of reasonableness review on all questions respects a legislature's choice to leave some matters first and foremost to an administrative decision maker, departing from that blanket presumption in the context of a statutory appeal respects the legislature's choice of a more involved role for the courts in supervising administrative decision making.

[47] The second reason is that, building on developments in the case law over the past several years, this decision conclusively closes the door on the application of a contextual analysis to determine

au principe bien établi voulant que le législateur ne parle pas pour ne rien dire : *Procureur général du Québec c. Carrières Ste-Thérèse Ltée*, [1985] 1 R.C.S. 831, p. 838.

[46] Enfin, et ceci est déterminant, les pourvois dont la Cour est saisie ont permis de procéder à un examen exhaustif et fouillé de l'analyse relative à la norme de contrôle afin de remédier aux difficultés conceptuelles et pratiques qui contribuent à rendre ce domaine du droit éprouvant tant pour les justiciables que pour les cours de justice. Pour atteindre cet objectif, le cadre d'analyse révisé doit permettre l'application des mécanismes d'appel prévus par la loi, et ce, pour au moins deux raisons. La première est d'ordre conceptuel. Dans le passé, notre Cour a fait abstraction d'une disposition créant un droit d'appel notamment dans le cas où le décideur possède une expertise relative supérieure — ce que la Cour a appelé le principe de la « spécialisation des fonctions » dans *Pezim*, p. 591. Or, comme nous l'avons mentionné, la présomption d'application de la norme de la décision raisonnable en cas de contrôle judiciaire n'est plus fondée sur la notion d'expertise relative. Elle repose plutôt maintenant sur le respect du choix d'organisation institutionnelle de la part du législateur qui a préféré confier le pouvoir décisionnel à un décideur administratif plutôt qu'à une cour de justice. Il serait incompatible avec ce fondement conceptuel de la présomption d'application de la norme de la décision raisonnable de faire fi d'indications claires que le législateur a délibérément voulu conférer un rôle plus actif aux cours de justice. Tout comme le fait de reconnaître la présomption d'application de la norme de la décision raisonnable à toutes les questions respecte la volonté du législateur de s'en remettre d'abord et avant tout à un décideur administratif pour certaines choses, la dérogation à cette présomption générale dans le cas d'un appel prévu par la loi respecte la volonté du législateur de conférer un rôle plus actif aux cours de justice dans la supervision du processus décisionnel administratif.

[47] La deuxième raison tient à ceci. Tenant compte de l'évolution de la jurisprudence au cours des dernières années, les présents motifs ferment de manière définitive la porte au recours à l'analyse contextuelle

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the applicable standard, and in doing so streamlines and simplifies the standard of review framework. With the elimination of the contextual approach to selecting the standard of review, the need for statutory rights of appeal to play a role becomes clearer. Eliminating the contextual approach means that statutory rights of appeal must now either play no role in administrative law or be accepted as directing a departure from the default position of reasonableness review. The latter must prevail.

[48] Our colleagues agree that the time has come to put the contextual approach espoused in *Dunsmuir* to rest and adopt a presumption of reasonableness review. We part company on the extent to which the departure from the contextual approach requires corresponding modifications to other aspects of the standard of review jurisprudence. We consider that the elimination of the contextual approach represents an incremental yet important adjustment to Canada's judicial review roots. While it is true that this Court has, in the past several years of jurisprudential development, warned that the contextual approach should be applied "sparingly" (*CHRC*, at para. 46), it is incorrect to suggest that our jurisprudence was such that the elimination of the contextual analysis was "all but complete": reasons of Abella and Karakatsanis JJ., at para. 277; see, in this regard, *CHRC*, at paras. 44-54; *Saguenay*, at para. 46; *Tervita*, at para. 35; *McLean*, at para. 22; *Edmonton East*, at para. 32; *Rogers Communications Inc. v. Society of Composers, Authors and Music Publishers of Canada*, 2012 SCC 35, [2012] 2 S.C.R. 283, at para. 15. The contextual analysis was one part of the broader standard of review framework set out in *Dunsmuir*. A departure from this aspect of the *Dunsmuir* framework requires a principled rebalancing of the framework as a whole in order to maintain the equilibrium between the roles of administrative decision makers and reviewing courts that is fundamental to administrative law.

pour déterminer la norme de contrôle applicable, et ce, afin d'alléger et de simplifier le cadre d'analyse applicable à la norme de contrôle. Devant cette mise à l'écart de l'approche contextuelle dans le choix de la norme de contrôle applicable, il devient nécessaire que les droits d'appel prévus par la loi jouent le rôle qui est le leur. L'élimination de l'approche contextuelle fait en sorte que les droits d'appel accordés par la loi doivent maintenant soit ne jouer aucun rôle en droit administratif, soit être reconnus comme indiquant une dérogation à l'application par défaut de la norme de la décision raisonnable. La seconde thèse doit prévaloir.

[48] Nos collègues reconnaissent que le temps est venu d'en finir avec l'approche contextuelle énoncée dans l'arrêt *Dunsmuir* et d'adopter une présomption d'application de la norme de la décision raisonnable. Nous divergeons d'opinion sur la mesure dans laquelle cette rupture avec l'approche contextuelle requiert des modifications correspondantes à d'autres aspects de la jurisprudence en matière de norme de contrôle. Nous considérons que l'élimination de l'approche contextuelle constitue un ajustement progressif mais important aux fondements du contrôle judiciaire canadien. S'il est vrai que la jurisprudence de notre Cour a, au cours des dernières années, précisé que l'approche contextuelle devrait être appliquée « avec parcimonie » (*CCDP*, par. 46), il est inexact de soutenir que l'état de notre jurisprudence est tel que l'élimination de l'analyse contextuelle était « pratiquement achevée » : motifs des juges Abella et Karakatsanis, par. 277; voir, à ce sujet, *CCDP*, par. 44-54; *Saguenay*, par. 46; *Tervita*, par. 35; *McLean*, par. 22; *Edmonton East*, par. 32; *Rogers Communications Inc. c. Société canadienne des auteurs, compositeurs et éditeurs de musique*, 2012 CSC 35, [2012] 2 R.C.S. 283, par. 15. L'analyse contextuelle forme un volet du cadre d'analyse général de la norme de contrôle établi dans l'arrêt *Dunsmuir*. Une rupture avec cet aspect du cadre d'analyse énoncé dans l'arrêt *Dunsmuir* exige un rééquilibrage réfléchi du cadre d'analyse dans son ensemble afin de maintenir l'équilibre, fondamental en droit administratif, entre les rôles des décideurs administratifs et ceux des cours de révision.

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[49] In our view, with the starting position of this presumption of reasonableness review, and in the absence of a searching contextual analysis, legislative intent can only be given effect in this framework if statutory appeal mechanisms, as clear signals of legislative intent with respect to the applicable standard of review, are given effect through the application of appellate standards by reviewing courts. Conversely, in such a framework that is based on a presumption of reasonableness review, contextual factors that courts once looked to as signalling deferential review, such as privative clauses, serve no independent or additional function in identifying the standard of review.

[49] À notre avis, vu le point de départ qui repose sur cette présomption d'application de la norme de la décision raisonnable, et en l'absence d'une analyse contextuelle, le présent cadre d'analyse se doit de donner effet à l'intention du législateur en matière de mécanismes d'appel prévus par la loi. Il s'agit là d'indications claires de la volonté du législateur sur la norme de contrôle applicable, lesquelles imposent aux cours de révision d'appliquer les normes d'intervention qui prévalent en appel. À l'inverse, dans un tel cadre d'analyse qui repose sur la présomption d'application de la norme de la décision raisonnable, les facteurs contextuels que les cours de justice voyaient autrefois comme des signes militant en faveur d'un contrôle empreint de déférence, telles les clauses privatives, ne remplissent dorénavant aucune fonction indépendante ou supplémentaire dans la détermination de la norme de contrôle applicable.

[50] We wish, at this juncture, to make three points regarding how the presence of a statutory appeal mechanism should inform the choice of standard analysis. First, we note that statutory regimes that provide for parties to appeal to a court from an administrative decision may allow them to do so in all cases (that is, as of right) or only with leave of the court. While the existence of a leave requirement will affect whether a court will hear an appeal from a particular decision, it does not affect the standard to be applied if leave is given and the appeal is heard.

[50] Nous apportons ici trois précisions sur le rôle que joue le mécanisme d'appel prévu par la loi dans le choix de la norme de contrôle applicable. Premièrement, nous soulignons que les régimes législatifs peuvent accorder aux parties le droit de porter en appel une décision administrative devant une cour de justice en tout temps (c'est-à-dire, de plein droit) ou sur autorisation. Si l'obligation d'obtenir une autorisation détermine si un appel à l'encontre d'une décision sera instruit, elle n'a aucun impact sur la norme qui prévaut en appel une fois l'autorisation accordée.

[51] Second, we note that not all legislative provisions that contemplate a court reviewing an administrative decision actually provide a right of appeal. Some provisions simply recognize that all administrative decisions are subject to judicial review and address procedural or other similar aspects of judicial review in a particular context. Since these provisions do not give courts an appellate function, they do not authorize the application of appellate standards. Some examples of such provisions are ss. 18 to 18.2, 18.4 and 28 of the *Federal Courts Act*, which confer jurisdiction on the Federal Court and the Federal Court of Appeal to hear and determine applications for judicial review of decisions of federal bodies and grant remedies, and also address procedural aspects of such applications: see *Khosa*, at para. 34. Another example is the current version of s. 470 of

[51] Deuxièmement, nous rappelons que ce ne sont pas toutes les dispositions législatives envisageant la possibilité qu'une cour de justice puisse contrôler une décision administrative qui confèrent dans les faits un droit d'appel. Certaines dispositions reconnaissent simplement que toute décision administrative est susceptible de contrôle judiciaire et traitent de questions de procédure ou d'autres éléments semblables du contrôle judiciaire applicable dans un contexte particulier. Comme elles n'attribuent pas de fonction d'appel aux cours de justice, ces dispositions ne permettent pas de recourir aux normes d'intervention applicables en appel. Parmi ces dispositions figurent les art. 18 à 18.2, 18.4 et 28 de la *Loi sur les Cours fédérales* qui donnent à la Cour fédérale et à la Cour d'appel fédérale compétence pour connaître des demandes de contrôle

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Alberta's *Municipal Government Act*, R.S.A. 2000, c. M-26, which does not provide for an appeal to a court, but addresses procedural considerations and consequences that apply "[w]here a decision of an assessment review board is the subject of an application for judicial review": s. 470(1).

[52] Third, we would note that statutory appeal rights are often circumscribed, as their scope might be limited with reference to the types of questions on which a party may appeal (where, for example, appeals are limited to questions of law) or the types of decisions that may be appealed (where, for example, not every decision of an administrative decision maker may be appealed to a court), or to the party or parties that may bring an appeal. However, the existence of a circumscribed right of appeal in a statutory scheme does not on its own preclude applications for judicial review of decisions, or of aspects of decisions, to which the appeal mechanism does not apply, or by individuals who have no right of appeal. But any such application for judicial review is distinct from an appeal, and the presumption of reasonableness review that applies on judicial review cannot then be rebutted by reference to the statutory appeal mechanism.

C. *The Applicable Standard Is Correctness Where Required by the Rule of Law*

[53] In our view, respect for the rule of law requires courts to apply the standard of correctness for certain types of legal questions: constitutional questions, general questions of law of central importance to the legal system as a whole and questions regarding the jurisdictional boundaries between two or more administrative bodies. The application of the correctness standard for such questions respects the unique role of the judiciary in interpreting the Constitution

judiciaire visant des offices fédéraux, accorder réparation le cas échéant et se prononcer sur les aspects procéduraux de ces demandes : voir *Khosa*, par. 34. Un autre exemple est celui de l'art. 470, dans sa version actuelle, de la *Municipal Government Act*, R.S.A. 2000, c. M-26, de l'Alberta, qui ne prévoit pas de droit d'appel devant une cour de justice, mais porte plutôt sur des considérations et des conséquences procédurales [TRADUCTION] « [d]ans le cas où la décision d'un comité de révision des évaluations fait l'objet d'une demande de contrôle judiciaire » : par. 470(1).

[52] Troisièmement, nous soulignons que les droits d'appel conférés par la loi sont souvent circonscrits : leur portée peut être restreinte en fonction des types de questions sur lesquelles une partie peut interjeter appel (par exemple, lorsque le droit d'appel ne vise que des questions de droit), ou en fonction du type de décision susceptible d'être portée en appel (lorsque, par exemple, certaines décisions d'un décideur administratif sont sans appel devant une cour de justice), ou bien en fonction de la partie ou des parties qui peuvent porter la cause en appel. La présence d'un droit d'appel circonscrit dans le cadre d'un régime législatif ne fait pas obstacle en soi aux demandes de contrôle judiciaire visant des décisions ou des questions qui ne sont pas visées par le mécanisme d'appel, ni aux recours intentés par des personnes qui n'ont aucun droit d'appel. Dans de tels cas, ce contrôle judiciaire diffère toutefois d'un appel, et la présomption d'application de la norme de la décision raisonnable lors du contrôle judiciaire ne sera pas réfutée en invoquant le mécanisme d'appel autrement prévu par la loi.

C. *La norme de la décision correcte s'impose lorsque la primauté du droit l'exige*

[53] À notre avis, le respect de la primauté du droit exige que les cours de justice appliquent la norme de la décision correcte à l'égard de certains types de questions de droit : les questions constitutionnelles, les questions de droit générales d'une importance capitale pour le système juridique dans son ensemble, et les questions liées aux délimitations des compétences respectives d'organismes administratifs. L'application de la norme de la décision

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and ensures that courts are able to provide the last word on questions for which the rule of law requires consistency and for which a final and determinate answer is necessary: *Dunsmuir*, at para. 58.

[54] When applying the correctness standard, the reviewing court may choose either to uphold the administrative decision maker's determination or to substitute its own view: *Dunsmuir*, at para. 50. While it should take the administrative decision maker's reasoning into account — and indeed, it may find that reasoning persuasive and adopt it — the reviewing court is ultimately empowered to come to its own conclusions on the question.

(1) Constitutional Questions

[55] Questions regarding the division of powers between Parliament and the provinces, the relationship between the legislature and the other branches of the state, the scope of Aboriginal and treaty rights under s. 35 of the *Constitution Act, 1982*, and other constitutional matters require a final and determinate answer from the courts. Therefore, the standard of correctness must continue to be applied in reviewing such questions: *Dunsmuir*, at para. 58; *Westcoast Energy Inc. v. Canada (National Energy Board)*, [1998] 1 S.C.R. 322.

[56] The Constitution — both written and unwritten — dictates the limits of all state action. Legislatures and administrative decision makers are bound by the Constitution and must comply with it. A legislature cannot alter the scope of its own constitutional powers through statute. Nor can it alter the constitutional limits of executive power by delegating authority to an administrative body. In other words, although a legislature may choose what powers it delegates to an administrative body, it cannot delegate powers that it does not constitutionally have. The constitutional authority to act must have determinate, defined and consistent limits, which necessitates the application of the correctness standard.

correcte à l'égard de ces questions s'accorde avec le rôle unique du pouvoir judiciaire dans l'interprétation de la Constitution, et fait en sorte que les cours de justice ont le dernier mot sur des questions à l'égard desquelles la primauté du droit exige une cohérence et une réponse décisive et définitive s'impose : *Dunsmuir*, par. 58.

[54] La cour de révision qui applique la norme de la décision correcte peut choisir de confirmer la conclusion du décideur administratif ou de lui substituer sa propre conclusion : *Dunsmuir*, par. 50. S'il est opportun que la cour de révision tienne compte du raisonnement du décideur administratif — et puisse en fait le trouver convaincant et le faire sien — elle est en fin de compte habilitée à tirer ses propres conclusions sur la question en litige.

(1) Les questions constitutionnelles

[55] L'examen des questions touchant au partage des compétences entre le Parlement et les provinces, au rapport entre le législateur et les autres organes de l'État, à la portée des droits ancestraux et droits issus de traités reconnus à l'art. 35 de la *Loi constitutionnelle de 1982*, et à d'autres questions de droit constitutionnel nécessite une réponse décisive et définitive des cours de justice. Il faut donc continuer d'appliquer la norme de la décision correcte au moment d'examiner les questions de cette nature : *Dunsmuir*, par. 58; *Westcoast Energy Inc. c. Canada (Office national de l'énergie)*, [1998] 1 R.C.S. 322.

[56] La Constitution tant écrite que non écrite circonscrit l'ensemble des mesures prises par l'État. Les législateurs et les décideurs administratifs sont tenus de respecter la Constitution. Un législateur ne saurait modifier la portée de ses propres pouvoirs constitutionnels par voie législative. Il ne saurait non plus modifier les limites constitutionnelles de ses pouvoirs exécutifs en déléguant ceux-ci à un organe administratif. En d'autres termes, si un législateur peut choisir les pouvoirs à déléguer à un organisme administratif, il ne peut déléguer des pouvoirs dont la Constitution ne l'investit pas. Le pouvoir constitutionnel d'agir doit comporter des limites définies et uniformes, ce qui commande l'application de la norme de la décision correcte.

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[57] Although the *amici* questioned the approach to the standard of review set out in *Doré v. Barreau du Québec*, 2012 SCC 12, [2012] 1 S.C.R. 395, a reconsideration of that approach is not germane to the issues in this appeal. However, it is important to draw a distinction between cases in which it is alleged that the effect of the administrative decision being reviewed is to unjustifiably limit rights under the *Canadian Charter of Rights and Freedoms* (as was the case in *Doré*) and those in which the issue on review is whether a provision of the decision maker's enabling statute violates the *Charter* (see, e.g., *Nova Scotia (Workers' Compensation Board) v. Martin*, 2003 SCC 54, [2003] 2 S.C.R. 504, at para. 65). Our jurisprudence holds that an administrative decision maker's interpretation of the latter issue should be reviewed for correctness, and that jurisprudence is not displaced by these reasons.

(2) General Questions of Law of Central Importance to the Legal System as a Whole

[58] In *Dunsmuir*, a majority of the Court held that, in addition to constitutional questions, general questions of law which are "both of central importance to the legal system as a whole and outside the adjudicator's specialized area of expertise" will require the application of the correctness standard: para. 60, citing *Toronto (City) v. C.U.P.E., Local 79*, 2003 SCC 63, [2003] 3 S.C.R. 77, at para. 62, per LeBel J., concurring. We remain of the view that the rule of law requires courts to have the final word with regard to general questions of law that are "of central importance to the legal system as a whole". However, a return to first principles reveals that it is not necessary to evaluate the decision maker's specialized expertise in order to determine whether the correctness standard must be applied in cases involving such questions. As indicated above (at para. 31) of the reasons, the consideration of expertise is folded into the new starting point adopted in these reasons, namely the presumption of reasonableness review.

[57] Bien que des *amici curiae* aient remis en question la méthode de détermination de la norme de contrôle établie dans l'arrêt *Doré c. Barreau du Québec*, 2012 CSC 12, [2012] 1 R.C.S. 395, le présent pourvoi ne nécessite pas que nous nous y attardions. Il importe par contre d'établir une distinction entre les cas où il est allégué que la décision administrative sous examen a pour effet de restreindre de façon injustifiable les droits consacrés par la *Charte canadienne des droits et libertés* (comme dans l'arrêt *Doré*) et les cas où le contrôle judiciaire porte sur la question de savoir si l'une des dispositions de la loi habilitante de l'organisme décisionnel viole la *Charte* (voir, p. ex., *Nouvelle-Écosse (Workers' Compensation Board) c. Martin*, 2003 CSC 54, [2003] 2 R.C.S. 504, par. 65). Suivant la jurisprudence de notre Cour, l'interprétation d'un décideur administratif sur ce dernier point doit être contrôlée selon la norme de la décision correcte. Les présents motifs n'ont pas pour effet d'écarter cette jurisprudence.

(2) Les questions de droit générales d'importance capitale pour le système juridique dans son ensemble

[58] Outre les questions constitutionnelles, la Cour a reconnu à la majorité dans l'arrêt *Dunsmuir* qu'une question de droit générale « à la fois, d'une importance capitale pour le système juridique dans son ensemble et étrangère au domaine d'expertise de l'arbitre » commande l'application de la norme de la décision correcte : par. 60, citant *Toronto (Ville) c. S.C.F.P., section locale 79*, 2003 CSC 63, [2003] 3 R.C.S. 77, par. 62, motifs concordants du juge LeBel. Nous demeurons d'avis que la primauté du droit exige que les cours de justice tranchent de manière définitive les questions de droit générales qui sont « d'importance capitale pour le système juridique dans son ensemble ». Toutefois, au regard des principes qui sous-tendent de telles questions, il n'est pas nécessaire d'examiner l'expertise spécialisée du décideur pour déterminer s'il faut appliquer la norme de la décision correcte en pareils cas. Comme l'indique le par. 31 des présents motifs, la prise en compte de l'expertise est incorporée au nouveau point de départ adopté dans les présents motifs, à savoir la présomption d'application de la norme de la décision raisonnable.

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[59] As the majority of the Court recognized in *Dunsmuir*, the key underlying rationale for this category of questions is the reality that certain general questions of law "require uniform and consistent answers" as a result of "their impact on the administration of justice as a whole": *Dunsmuir*, at para. 60. In these cases, correctness review is necessary to resolve general questions of law that are of "fundamental importance and broad applicability", with significant legal consequences for the justice system as a whole or for other institutions of government: see *Toronto (City)*, at para. 70; *Alberta (Information and Privacy Commissioner) v. University of Calgary*, 2016 SCC 53, [2016] 2 S.C.R. 555, at para. 20; *Canadian National Railway*, at para. 60; *Chagnon v. Syndicat de la fonction publique et parapublique du Québec*, 2018 SCC 39, [2018] 2 S.C.R. 687, at para. 17; *Saguenay*, at para. 51; *Canada (Canadian Human Rights Commission) v. Canada (Attorney General)*, 2011 SCC 53, [2011] 3 S.C.R. 471 ("*Mowat*"), at para. 22; *Commission scolaire de Laval v. Syndicat de l'enseignement de la région de Laval*, 2016 SCC 8, [2016] 1 S.C.R. 29, at para. 38. For example, the question in *University of Calgary* could not be resolved by applying the reasonableness standard, because the decision would have had legal implications for a wide variety of other statutes and because the uniform protection of solicitor-client privilege — at issue in that case — is necessary for the proper functioning of the justice system: *University of Calgary*, at paras. 19-26. As this shows, the resolution of general questions of law "of central importance to the legal system as a whole" has implications beyond the decision at hand, hence the need for "uniform and consistent answers".

[60] This Court's jurisprudence continues to provide important guidance regarding what constitutes a general question of law of central importance to the legal system as a whole. For example, the following general questions of law have been held to be of central importance to the legal system as a whole: when an administrative proceeding will be barred by the doctrines of *res judicata* and abuse of

[59] Comme les juges majoritaires de la Cour l'ont reconnu dans l'arrêt *Dunsmuir*, la principale raison d'être de cette catégorie de questions est la nécessité de trancher certaines questions de droit générales « de manière uniforme et cohérente étant donné [leurs] répercussions sur l'administration de la justice dans son ensemble » : *Dunsmuir*, par. 60. Dans ces cas, la norme de contrôle de la décision correcte s'impose à l'égard des questions de droit générales qui sont « d'une importance fondamentale, de grande portée » et susceptibles d'avoir des répercussions juridiques significatives sur le système de justice dans son ensemble ou sur d'autres institutions gouvernementales : voir *Toronto (Ville)*, par. 70; *Alberta (Information and Privacy Commissioner) c. University of Calgary*, 2016 CSC 53, [2016] 2 R.C.S. 555, par. 20; *Compagnie des chemins de fer nationaux du Canada*, par. 60; *Chagnon c. Syndicat de la fonction publique et parapublique du Québec*, 2018 CSC 39, [2018] 2 R.C.S. 687, par. 17; *Saguenay*, par. 51; *Canada (Commission canadienne des droits de la personne) c. Canada (Procureur général)*, 2011 CSC 53, [2011] 3 R.C.S. 471 (« *Mowat* »), par. 22; *Commission scolaire de Laval c. Syndicat de l'enseignement de la région de Laval*, 2016 CSC 8, [2016] 1 R.C.S. 29, par. 38. Par exemple, la question soulevée dans *University of Calgary* ne pouvait pas être tranchée par application de la norme de la décision raisonnable en raison des conséquences juridiques de la décision sur une vaste gamme d'autres régimes législatifs et en raison de la nécessité d'une protection uniforme du secret professionnel de l'avocat — en cause dans cette affaire — pour le bon fonctionnement du système de justice : *University of Calgary*, par. 19-26. Ainsi que le montre cette jurisprudence, résoudre des questions de droit générales « d'importance capitale pour le système juridique dans son ensemble » a des répercussions qui transcendent la décision en cause, d'où le besoin de « réponses uniformes et cohérentes ».

[60] La jurisprudence de notre Cour continue de fournir des indications importantes sur ce qui constitue une question de droit générale d'une importance capitale pour le système juridique dans son ensemble. Par exemple, on a jugé que les questions de droit générales suivantes sont d'importance capitale pour le système juridique dans son ensemble : lorsqu'une procédure administrative est prescrite par

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process (*Toronto (City)*, at para. 15); the scope of the state's duty of religious neutrality (*Saguenay*, at para. 49); the appropriateness of limits on solicitor-client privilege (*University of Calgary*, at para. 20); and the scope of parliamentary privilege (*Chagnon*, at para. 17). We caution, however, that this jurisprudence must be read carefully, given that expertise is no longer a consideration in identifying such questions: see, e.g., *CHRC*, at para. 43.

[61] We would stress that the mere fact that a dispute is "of wider public concern" is not sufficient for a question to fall into this category — nor is the fact that the question, when framed in a general or abstract sense, touches on an important issue: see, e.g., *Communications, Energy and Paperworkers Union of Canada, Local 30 v. Irving Pulp & Paper, Ltd.*, 2013 SCC 34, [2013] 2 S.C.R. 458, at para. 66; *McLean*, at para. 28; *Barreau du Québec v. Quebec (Attorney General)*, 2017 SCC 56, [2017] 2 S.C.R. 488, at para. 18. The case law reveals many examples of questions this Court has concluded are *not* general questions of law of central importance to the legal system as a whole. These include whether a certain tribunal can grant a particular type of compensation (*Mowat*, at para. 25); when estoppel may be applied as an arbitral remedy (*Nor-Man Regional Health Authority Inc. v. Manitoba Association of Health Care Professionals*, 2011 SCC 59, [2011] 3 S.C.R. 616, at paras. 37-38); the interpretation of a statutory provision prescribing timelines for an investigation (*Alberta Teachers*, at para. 32); the scope of a management rights clause in a collective agreement (*Irving Pulp & Paper*, at paras. 7, 15-16 and 66, per Rothstein and Moldaver JJ., dissenting but not on this point); whether a limitation period had been triggered under securities legislation (*McLean*, at paras. 28-31); whether a party to a confidential contract could bring a complaint under a particular regulatory regime (*Canadian National Railway*, at para. 60); and the scope of an exception allowing non-advocates to represent a minister in certain proceedings (*Barreau du Québec*, at paras. 17-18). As these comments and examples indicate, this does not mean that simply because expertise no longer

l'application des doctrines de l'autorité de la chose jugée et de l'abus de procédure (*Toronto (Ville)*, par. 15); la portée de l'obligation de neutralité religieuse de l'État (*Saguenay*, par. 49); le bien-fondé des limites du secret professionnel de l'avocat (*University of Calgary*, par. 20); et la portée du privilège parlementaire (*Chagnon*, par. 17). Il importe par contre de préciser qu'il y a lieu d'interpréter avec prudence ces décisions, puisque l'expertise perd dorénavant sa pertinence lorsqu'il s'agit d'identifier les questions appartenant à cette catégorie : voir, p. ex., *CCDP*, par. 43.

[61] Nous tenons à préciser que le simple fait qu'un conflit puisse être « d'intérêt public général » ne suffit pas pour qu'une question entre dans cette catégorie — pas plus que ne l'est le fait qu'une question formulée dans un sens général ou abstrait porte sur un enjeu important : voir, p. ex., *Syndicat canadien des communications, de l'énergie et du papier, section locale 30 c. Pâtes & Papier Irving, Ltée*, 2013 CSC 34, [2013] 2 R.C.S. 458, par. 66; *McLean*, par. 28; *Barreau du Québec c. Québec (Procureure générale)*, 2017 CSC 56, [2017] 2 R.C.S. 488, par. 18. La jurisprudence renferme de nombreux exemples de questions que notre Cour *n'*a *pas* considérées comme étant des questions de droit générales d'importance capitale pour le système juridique dans son ensemble. Mentionnons, entre autres, la question de savoir si un certain tribunal administratif peut accorder ou non un type particulier d'indemnité (*Mowat*, par. 25); les cas dans lesquels un arbitre peut appliquer une préclusion à titre de réparation (*Nor-Man Regional Health Authority Inc. c. Manitoba Association of Health Care Professionals*, 2011 CSC 59, [2011] 3 R.C.S. 616, par. 37-38); l'interprétation d'une disposition législative prescrivant le délai pour mener à terme une enquête (*Alberta Teachers*, par. 32); la portée des droits de la direction prévus dans une convention collective (*Pâtes & Papier Irving*, par. 7, 15-16 et 66, les juges Rothstein et Moldaver, dissidents mais non sur ce point); l'application d'un délai de prescription en vertu d'une loi portant sur les valeurs mobilières (*McLean*, par. 28-31); la possibilité pour une partie à un contrat confidentiel de porter plainte sous un régime particulier de réglementation (*Compagnie des chemins de fer nationaux du Canada*, par. 60); et la portée d'une exception permettant aux non-avocats

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plays a role in the selection of the standard of review, questions of central importance are now transformed into a broad catch-all category for correctness review.

[62] In short, general questions of law of central importance to the legal system as a whole require a single determinate answer. In cases involving such questions, the rule of law requires courts to provide a greater degree of legal certainty than reasonableness review allows.

(3) Questions Regarding the Jurisdictional Boundaries Between Two or More Administrative Bodies

[63] Finally, the rule of law requires that the correctness standard be applied in order to resolve questions regarding the jurisdictional boundaries between two or more administrative bodies: *Dunsmuir*, at para. 61. One such question arose in *Regina Police Assn. Inc. v. Regina (City) Board of Police Commissioners*, 2000 SCC 14, [2000] 1 S.C.R. 360, in which the issue was the jurisdiction of a labour arbitrator to consider matters of police discipline and dismissal that were otherwise subject to a comprehensive legislative regime. Similarly, in *Quebec (Commission des droits de la personne et des droits de la jeunesse) v. Quebec (Attorney General)*, 2004 SCC 39, [2004] 2 S.C.R. 185, the Court considered a jurisdictional dispute between a labour arbitrator and the Quebec Human Rights Tribunal.

[64] Administrative decisions are rarely contested on this basis. Where they are, however, the rule of law requires courts to intervene where one administrative body has interpreted the scope of its authority in a manner that is incompatible with the jurisdiction of another. The rationale for this category of questions is simple: the rule of law cannot tolerate conflicting orders and proceedings where they result in a

de représenter un ministre dans certaines instances (*Barreau du Québec*, par. 17-18). Comme ces commentaires l'indiquent et ces exemples le montrent, le simple fait que l'expertise n'occupe plus de place dans la sélection de la norme de contrôle ne veut pas dire que les questions d'importance capitale forment désormais une vaste catégorie fourre-tout à laquelle s'applique la norme de la décision correcte.

[62] En somme, les questions de droit générales d'importance capitale pour le système juridique dans son ensemble exigent une réponse unique et définitive. Lorsque ces questions se posent, la primauté du droit requiert que les cours de justice apportent un niveau de certitude juridique qui soit supérieur à celui que permet le contrôle en fonction de la norme de la décision raisonnable.

(3) Les questions liées aux délimitations des compétences respectives d'organismes administratifs

[63] Enfin, la primauté du droit veut que la norme de la décision correcte s'applique à la délimitation des compétences respectives d'organismes administratifs : *Dunsmuir*, par. 61. Une telle question s'est posée dans l'arrêt *Regina Police Assn. Inc. c. Regina (Ville) Board of Police Commissioners*, 2000 CSC 14, [2000] 1 R.C.S. 360, où le débat portait sur la compétence d'un arbitre en matière de relations de travail pour statuer sur des questions de discipline et de renvoi de policiers qui étaient par ailleurs régies par un régime législatif complet. De même, dans l'arrêt *Québec (Commission des droits de la personne et des droits de la jeunesse) c. Québec (Procureur général)*, 2004 CSC 39, [2004] 2 R.C.S. 185, la Cour était saisie d'un conflit de compétence entre un arbitre en droit du travail et le Tribunal des droits de la personne du Québec.

[64] Il est rare que les décisions administratives soient contestées pour ce motif. Le cas échéant, toutefois, la primauté du droit commande l'intervention des cours de justice lorsqu'un organisme administratif interprète l'étendue de ses pouvoirs d'une manière qui est incompatible avec la compétence d'un autre organisme administratif. La raison d'être de cette catégorie de questions est simple : la primauté

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true operational conflict between two administrative bodies, pulling a party in two different and incompatible directions: see *British Columbia Telephone Co.*, at para. 80, per McLachlin J. (as she then was), concurring. Members of the public must know where to turn in order to resolve a dispute. As with general questions of law of central importance to the legal system as a whole, the application of the correctness standard in these cases safeguards predictability, finality and certainty in the law of administrative decision making.

D. *A Note Regarding Jurisdictional Questions*

[65] We would cease to recognize jurisdictional questions as a distinct category attracting correctness review. The majority in *Dunsmuir* held that it was "without question" (para. 50) that the correctness standard must be applied in reviewing jurisdictional questions (also referred to as true questions of jurisdiction or *vires*). True questions of jurisdiction were said to arise "where the tribunal must explicitly determine whether its statutory grant of power gives it the authority to decide a particular matter": see *Dunsmuir*, at para. 59; *Quebec (Attorney General) v. Guérin*, 2017 SCC 42, [2017] 2 S.C.R. 3, at para. 32. Since *Dunsmuir*, however, majorities of this Court have questioned the necessity of this category, struggled to articulate its scope and "expressed serious reservations about whether such questions can be distinguished as a separate category of questions of law": *McLean*, at para. 25, referring to *Alberta Teachers*, at para. 34; *Edmonton East*, at para. 26; *Guérin*, at paras. 32-36; *CHRC*, at paras. 31-41.

[66] As Gascon J. noted in *CHRC*, the concept of "jurisdiction" in the administrative law context is inherently "slippery": para. 38. This is because, in theory, any challenge to an administrative decision can be characterized as "jurisdictional" in the sense that it calls into question whether the decision maker had the authority to act as it did: see *CHRC*,

du droit ne saurait tolérer des ordonnances et des procédures qui entraînent un véritable conflit opérationnel entre deux organismes administratifs, de sorte qu'une partie se retrouve aux prises avec deux décisions contradictoires : voir *British Columbia Telephone Co.*, par. 80, motifs concordants de la juge McLachlin (plus tard juge en chef). Les membres du public doivent savoir à qui s'adresser en vue de régler un litige. À l'instar des questions de droit générales d'importance capitale pour le système juridique dans son ensemble, l'application de la norme de la décision correcte s'impose dans ces cas par souci de prévisibilité, de certitude et de caractère définitif du processus décisionnel en droit administratif.

D. *Un mot sur les questions de compétence*

[65] Nous sommes d'avis de mettre fin à la reconnaissance des questions de compétence comme une catégorie distincte devant faire l'objet d'un contrôle selon la norme de la décision correcte. Selon la majorité dans l'arrêt *Dunsmuir*, il ne faisait « aucun doute » (par. 50) que les questions liées à la compétence (ou les questions touchant véritablement à la compétence) devaient être examinées selon la norme de la décision correcte. Une véritable question de compétence se posait « lorsque le tribunal administratif [devait] déterminer expressément si les pouvoirs dont le législateur l'a investi l'autoris[ai]ent à trancher une question » : voir *Dunsmuir*, par. 59; *Québec (Procureure générale) c. Guérin*, 2017 CSC 42, [2017] 2 R.C.S. 3, par. 32. Or, depuis l'arrêt *Dunsmuir*, des opinions des juges majoritaires de la Cour ont mis en doute la pertinence de cette catégorie, ont peiné à en définir la portée et ont affirmé « douter sérieusement que la question appartienne à une catégorie distincte de questions de droit » : *McLean*, par. 25, renvoyant à *Alberta Teachers*, par. 34; *Edmonton East*, par. 26; *Guérin*, par. 32-36; *CCDP*, par. 31-41.

[66] Comme l'a fait remarquer le juge Gascon dans l'arrêt *CCDP*, la « compétence » en droit administratif est, de par sa nature même, un concept « aux contours flous » : par. 38. Il en est ainsi, parce que, en théorie, toute contestation d'une décision administrative peut être qualifiée de question qui « touche à la compétence », en ce sens qu'elle sème un doute à

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at para. 38; *Alberta Teachers*, at para. 34; see similarly *City of Arlington, Texas v. Federal Communications Commission*, 569 U.S. 290 (2013), at p. 299. Although this Court's jurisprudence contemplates that only a much narrower class of "truly" jurisdictional questions requires correctness review, it has observed that there are no "clear markers" to distinguish such questions from other questions related to the interpretation of an administrative decision maker's enabling statute: see *CHRC*, at para. 38. Despite differing views on whether it is possible to demarcate a class of "truly" jurisdictional questions, there is general agreement that "it is often difficult to distinguish between exercises of delegated power that raise truly jurisdictional questions from those entailing an unremarkable application of an enabling statute": *CHRC*, at para. 111, per Brown J., concurring. This tension is perhaps clearest in cases where the legislature has delegated broad authority to an administrative decision maker that allows the latter to make regulations in pursuit of the objects of its enabling statute: see, e.g., *Green v. Law Society of Manitoba*, 2017 SCC 20, [2017] 1 S.C.R. 360; *West Fraser Mills Ltd. v. British Columbia (Workers' Compensation Appeal Tribunal)*, 2018 SCC 22, [2018] 1 S.C.R. 635.

[67] In *CHRC*, the majority, while noting this inherent difficulty — and the negative impact on litigants of the resulting uncertainty in the law — nonetheless left the question of whether the category of true questions of jurisdiction remains necessary to be determined in a later case. After hearing submissions on this issue and having an adequate opportunity for reflection on this point, we are now in a position to conclude that it is not necessary to maintain this category of correctness review. The arguments that support maintaining this category — in particular the concern that a delegated decision maker should not be free to determine the scope of its own authority — can be addressed adequately by applying the framework for conducting reasonableness review that we describe below. Reasonableness review is both robust and responsive to context. A proper application of the reasonableness standard will enable courts to fulfill

savoir si le décideur était habilité à agir comme il l'a fait : voir *CCDP*, par. 38; *Alberta Teachers*, par. 34; voir également *City of Arlington, Texas c. Federal Communications Commission*, 569 U.S. 290 (2013), p. 299. Si notre Cour indique dans sa jurisprudence que seule une catégorie beaucoup plus circonscrite de questions touchant « véritablement » à la compétence appelle la norme de la décision correcte, elle fait aussi remarquer qu'il n'existe aucune « balise claire » qui permet de distinguer ces questions de celles touchant à l'interprétation de sa loi habilitante par un décideur administratif : voir *CCDP*, par. 38. Malgré les opinions divergentes sur la possibilité de délimiter la catégorie des questions touchant « véritablement » à la compétence, on s'entend généralement pour dire qu'il est « souvent difficile de distinguer l'exercice d'un pouvoir délégué qui soulève des questions touchant véritablement à la compétence de l'exercice du pouvoir qui fait intervenir l'application ordinaire d'une loi habilitante » : *CCDP*, par. 111, motifs concordants du juge Brown. Cette tension ressort peut-être le plus dans les cas où le législateur a délégué un large pouvoir à un organe administratif qui permet à celui-ci de concevoir des règlements dans la poursuite des objectifs de sa loi habilitante : voir, p. ex., *Green c. Société du Barreau du Manitoba*, 2017 CSC 20, [2017] 1 R.C.S. 360; *West Fraser Mills Ltd. c. Colombie-Britannique (Workers' Compensation Appeal Tribunal)*, 2018 CSC 22, [2018] 1 R.C.S. 635.

[67] Tout en soulignant cette difficulté inhérente — ainsi que l'effet néfaste de l'incertitude juridique qui en découle sur les justiciables — les juges majoritaires dans l'arrêt *CCDP* ont néanmoins laissé en suspens la question de savoir si la catégorie des questions touchant véritablement à la compétence était toujours nécessaire. Après avoir entendu les observations présentées à cet égard et saisi l'occasion de nous pencher sur ce point, nous sommes aujourd'hui en mesure de conclure qu'il n'est pas nécessaire de maintenir cette catégorie au sein des questions appelant la norme de la décision correcte. Les arguments à l'appui du maintien de cette catégorie — notamment la préoccupation relative au pouvoir du décideur, titulaire de pouvoirs délégués, de déterminer l'étendue de sa propre compétence — peuvent faire l'objet d'un examen adéquat au moyen du cadre d'analyse, exposé plus loin, qui doit servir

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their constitutional duty to ensure that administrative bodies have acted within the scope of their lawful authority without having to conduct a preliminary assessment regarding whether a particular interpretation raises a "truly" or "narrowly" jurisdictional issue and without having to apply the correctness standard.

[68] Reasonableness review does not give administrative decision makers free rein in interpreting their enabling statutes, and therefore does not give them licence to enlarge their powers beyond what the legislature intended. Instead, it confirms that the governing statutory scheme will always operate as a constraint on administrative decision makers and as a limit on their authority. Even where the reasonableness standard is applied in reviewing a decision maker's interpretation of its authority, precise or narrow statutory language will necessarily limit the number of *reasonable* interpretations open to the decision maker — perhaps limiting it to one. Conversely, where the legislature has afforded a decision maker broad powers in general terms — and has provided no right of appeal to a court — the legislature's intention that the decision maker have greater leeway in interpreting its enabling statute should be given effect. Without seeking to import the U.S. jurisprudence on this issue wholesale, we find that the following comments of the Supreme Court of the United States in *Arlington*, at p. 307, are apt:

> The fox-in-the-henhouse syndrome is to be avoided not by establishing an arbitrary and undefinable category of agency decision-making that is accorded no deference, but by taking seriously, and applying rigorously, in all cases, statutory limits on agencies' authority. Where [the legislature] has established a clear line, the agency cannot go beyond it; and where [the legislature] has established an ambiguous line, the agency can go no further than the ambiguity will fairly allow. But in rigorously applying the latter rule, a court need not pause to

à effectuer un contrôle selon la norme de la décision raisonnable. Le contrôle judiciaire selon cette norme est à la fois rigoureux et adapté au contexte. En l'appliquant adéquatement, les cours de justice sont en mesure d'accomplir leur devoir constitutionnel de veiller à ce que les organismes administratifs agissent dans les limites des pouvoirs qui leur sont conférés sans qu'il soit nécessaire de procéder à un examen préliminaire pour établir si une interprétation particulière soulève une question touchant « véritablement » et « étroitement » à la compétence et sans avoir à recourir à la norme de la décision correcte.

[68] La norme de la décision raisonnable ne permet pas aux décideurs administratifs d'interpréter leur loi habilitante à leur gré et ne les autorise donc pas à élargir la portée de leurs pouvoirs au-delà de ce que souhaitait le législateur. Elle vient plutôt confirmer que le régime législatif applicable servira toujours à circonscrire les actes ainsi que les pouvoirs des décideurs administratifs. Même dans les cas où l'interprétation que le décideur donne de ses pouvoirs fait l'objet d'un contrôle selon la norme de la décision raisonnable, un texte législatif formulé en termes précis ou étroits aura forcément pour effet de restreindre les interprétations *raisonnables* que le décideur peut retenir — en les limitant peut-être à une seule. À l'inverse, lorsque le législateur confère au décideur de vastes pouvoirs au moyen d'un texte législatif rédigé en termes généraux, et ne prévoit aucun droit d'appel devant une cour de justice, il y a lieu de donner effet à son intention d'accorder une plus grande latitude au décideur sur l'interprétation de sa loi habilitante. Sans pour autant chercher à importer en bloc la jurisprudence américaine sur ce point, nous estimons pertinents les propos suivants formulés par la Cour suprême des États-Unis dans l'arrêt *Arlington*, p. 307 :

> [TRADUCTION] Il faut éviter le syndrome du « loup dans la bergerie » non pas en créant une catégorie arbitraire et indéfinissable de décisions d'organismes à l'égard desquelles il n'y a pas lieu de faire preuve de déférence, mais en prenant au sérieux et en appliquant rigoureusement, dans tous les cas, les restrictions prévues par la loi relativement aux pouvoirs conférés à un organisme. Si [le législateur] trace une ligne de démarcation claire, l'organisme ne peut aller au-delà de celle-ci; si [le législateur] trace une ligne de démarcation ambiguë, l'organisme ne

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puzzle over whether the interpretive question presented is "jurisdictional."

peut dépasser les limites de l'ambiguïté même. Or, pour l'application rigoureuse de cette dernière règle, la cour de justice n'est pas nécessairement tenue de s'arrêter et d'essayer de comprendre si la question d'interprétation soulevée touche à la « compétence ».

E. *Other Circumstances Requiring a Derogation From the Presumption of Reasonableness Review*

E. *Les autres circonstances qui nécessitent de déroger à l'application de la norme de la décision raisonnable*

[69] In these reasons, we have identified five situations in which a derogation from the presumption of reasonableness review is warranted either on the basis of legislative intent (i.e., legislated standards of review and statutory appeal mechanisms) or because correctness review is required by the rule of law (i.e., constitutional questions, general questions of law of central importance to the legal system as a whole, and questions regarding jurisdictional boundaries between administrative bodies). This framework is the product of careful consideration undertaken following extensive submissions and based on a thorough review of the relevant jurisprudence. We are of the view, at this time, that these reasons address all of the situations in which a reviewing court should derogate from the presumption of reasonableness review. As previously indicated, courts should no longer engage in a contextual inquiry to determine the standard of review or to rebut the presumption of reasonableness review. Letting go of this contextual approach will, we hope, "get the parties away from arguing about the tests and back to arguing about the substantive merits of their case": *Alberta Teachers*, at para. 36, quoting *Dunsmuir*, at para. 145, per Binnie J., concurring.

[69] Dans les présents motifs, nous avons relevé cinq situations où se justifie une dérogation à la présomption de contrôle selon la norme de la décision raisonnable, soit sur le fondement de l'intention du législateur (en l'occurrence, les normes de contrôle établies par voie législative et les mécanismes d'appel prévus par la loi), soit parce que la primauté du droit exige un contrôle selon la norme de la décision correcte (en l'occurrence, les questions constitutionnelles, les questions de droit générales d'importance capitale pour le système juridique dans son ensemble, ainsi que les questions liées aux délimitations des compétences respectives d'organismes administratifs). Ce cadre d'analyse découle d'un examen minutieux, entrepris après avoir reçu des observations approfondies et procédé à une étude fouillée de la jurisprudence applicable. Pour le moment, nous estimons que les présents motifs couvrent l'ensemble des situations dans lesquelles il convient que la cour de révision déroge à la présomption de contrôle selon la norme de la décision raisonnable. Comme nous l'avons déjà indiqué, les cours de justice ne devraient plus recourir à l'analyse contextuelle pour déterminer la norme de contrôle applicable ou pour réfuter la présomption d'application de la norme de la décision raisonnable. En finir avec cette approche contextuelle fera en sorte, nous l'espérons, que « les parties cessent de débattre des critères applicables et fassent plutôt valoir leurs prétentions sur le fond » : *Alberta Teachers*, par. 36, citant *Dunsmuir*, par. 145, motifs concordants du juge Binnie.

[70] However, we would not definitively foreclose the possibility that another category could be recognized as requiring a derogation from the presumption of reasonableness review in a future case. But our reluctance to pronounce that the list of exceptions to the application of a reasonableness standard

[70] Toutefois, nous ne fermons pas définitivement la porte à la possibilité qu'une autre catégorie puisse ultérieurement être reconnue comme appelant une dérogation à la présomption de contrôle selon la norme de la décision raisonnable. Notre réticence à qualifier d'exhaustive la liste d'exceptions

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is closed should not be understood as inviting the routine establishment of new categories requiring correctness review. Rather, it is a recognition that it would be unrealistic to declare that we have contemplated every possible set of circumstances in which legislative intent or the rule of law will require a derogation from the presumption of reasonableness review. That being said, the recognition of any new basis for correctness review would be exceptional and would need to be consistent with the framework and the overarching principles set out in these reasons. In other words, any new category warranting a derogation from the presumption of reasonableness review on the basis of legislative intent would require a signal of legislative intent as strong and compelling as those identified in these reasons (i.e., a legislated standard of review or a statutory appeal mechanism). Similarly, the recognition of a new category of questions requiring correctness review that is based on the rule of law would be justified only where failure to apply correctness review would undermine the rule of law and jeopardize the proper functioning of the justice system in a manner analogous to the three situations described in these reasons.

[71] The *amici curiae* suggest that, in addition to the three categories of legal questions identified above, the Court should recognize an additional category of legal questions that would require correctness review on the basis of the rule of law: legal questions regarding which there is persistent discord or internal disagreement within an administrative body leading to legal incoherence. They argue that correctness review is necessary in such situations because the rule of law breaks down where legal inconsistency becomes the norm and the law's meaning comes to depend on the identity of the decision maker. The *amici curiae* submit that, where competing reasonable legal interpretations linger over time at the administrative

à l'application de la norme de la décision raisonnable ne doit cependant pas être interprétée comme visant à favoriser l'établissement routinier de nouvelles catégories de situations commandant l'application de la norme de la décision correcte. Cette réticence relève plutôt de la constatation qu'il serait illusoire de déclarer que nous avons envisagé toutes les combinaisons possibles de circonstances dans lesquelles l'intention du législateur ou la primauté du droit pourront commander une dérogation à la présomption d'application de la norme de la décision raisonnable. Cela dit, la reconnaissance de tout nouveau fondement pour l'application de la norme de la décision correcte devrait revêtir un caractère exceptionnel et devrait respecter le cadre d'analyse et les principes prépondérants énoncés dans les présents motifs. Autrement dit, toute nouvelle catégorie de questions qui justifie une dérogation à la norme de la décision raisonnable sur le fondement de l'intention du législateur devrait comporter une indication de cette volonté tout aussi solide et convaincante que les indications mentionnées dans les présents motifs (c.-à-d. une norme de contrôle établie par voie législative ou un mécanisme d'appel prévu par la loi). De la même manière, la reconnaissance d'une nouvelle catégorie de questions qui commande l'application de la norme de la décision correcte sur le fondement de la primauté du droit ne serait justifiée que dans le cas où le défaut d'appliquer la norme de la décision correcte risquerait d'ébranler la primauté du droit et mettrait en péril le bon fonctionnement du système de justice d'une façon analogue aux trois situations décrites dans les présents motifs.

[71] Selon les *amici curiae*, outre les trois catégories de questions de droit que nous avons déjà mentionnées, la Cour devrait reconnaître l'existence d'une autre catégorie de questions de droit qui commande l'application de la norme de la décision correcte sur le fondement de la primauté du droit : les questions de droit qui sèment constamment la discorde ou la dissension interne au sein d'un organisme administratif et qui mènent à l'incohérence du droit. Les *amici curiae* font valoir que l'application de la norme de la décision correcte s'impose en pareil cas parce que la primauté du droit est mise à mal lorsque l'incohérence du droit devient la norme et que les règles de droit dépendent de l'identité du décideur.

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level — such that a statute comes to mean, simultaneously, both "yes" and "no" — the courts must step in to provide a determinative answer to the question without according deference to the administrative decision maker: factum of the *amici curiae*, at para. 91.

[72] We are not persuaded that the Court should recognize a distinct correctness category for legal questions on which there is persistent discord within an administrative body. In *Domtar Inc. v. Quebec (Commission d'appel en matière de lésions professionnelles)*, [1993] 2 S.C.R. 756, this Court held that "a lack of unanimity [within a tribunal] is the price to pay for the decision-making freedom and independence given to the members of these tribunals": p. 800; see also *Ellis-Don Ltd. v. Ontario (Labour Relations Board)*, 2001 SCC 4, [2001] 1 S.C.R. 221, at para. 28. That said, we agree that the hypothetical scenario suggested by the *amici curiae* — in which the law's meaning depends on the identity of the individual decision maker, thereby leading to legal incoherence — is antithetical to the rule of law. In our view, however, the more robust form of reasonableness review set out below, which accounts for the value of consistency and the threat of arbitrariness, is capable, in tandem with internal administrative processes to promote consistency and with legislative oversight (see *Domtar*, at p. 801), of guarding against threats to the rule of law. Moreover, the precise point at which internal discord on a point of law would be so serious, persistent and unresolvable that the resulting situation would amount to "legal incoherence" and require a court to step in is not obvious. Given these practical difficulties, this Court's binding jurisprudence and the hypothetical nature of the problem, we decline to recognize such a category in this appeal.

Ils ajoutent que, dans les cas où des interprétations juridiques concurrentes et raisonnables persistent au niveau administratif — de sorte que la loi peut signifier à la fois « oui » et « non » — il appartient aux cours de justice d'intervenir et de trancher de manière décisive, et ce, sans faire preuve de déférence envers le décideur administratif : mémoire des *amici curiae*, par. 91.

[72] Nous ne sommes pas convaincus que la Cour devrait reconnaître l'existence d'une catégorie distincte de questions de droit qui appellent la norme de la décision correcte dans le cas où ces questions sèment constamment la discorde au sein d'un organisme administratif. Dans l'arrêt *Domtar Inc. c. Québec (Commission d'appel en matière de lésions professionnelles)*, [1993] 2 R.C.S. 756, notre Cour a conclu que « l'absence d'unanimité [parmi les membres d'un tribunal administratif] est [. . .] le prix à payer pour la liberté et l'indépendance décisionnelle accordées aux membres de ces mêmes tribunaux » : p. 800; voir aussi *Ellis-Don Ltd. c. Ontario (Commission des relations de travail)*, 2001 CSC 4, [2001] 1 R.C.S. 221, par. 28. Cela dit, nous convenons que le scénario hypothétique que proposent les *amici curiae* — où les règles de droit dépendent de l'identité du décideur et mènent à une incohérence du droit — va à l'encontre de la primauté du droit. Nous tenons cependant à préciser que le cadre d'application plus rigoureux de la norme de la décision raisonnable énoncé ci-dessous, qui tient compte de la valeur que représente la cohérence et du risque d'arbitraire, permet, de concert avec les processus administratifs internes qui favorisent l'uniformité et avec le contrôle que peut exercer le législateur (voir *Domtar*, p. 801), de se prémunir face aux menaces à la primauté du droit. En outre, il est difficile de cerner à quel moment une divergence interne sur une question de droit deviendrait grave, persistante et impossible à régler au point de créer une « incohérence du droit » et de commander l'intervention d'une cour de justice. Compte tenu de ces difficultés sur le plan pratique, des précédents de notre Cour et de la nature hypothétique du problème, nous nous abstenons de reconnaître l'existence d'une telle catégorie dans le présent pourvoi.

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III. Performing Reasonableness Review

[73] This Court's administrative law jurisprudence has historically focused on the analytical framework used to determine the applicable standard of review, while providing relatively little guidance on how to conduct reasonableness review in practice.

[74] In this section of our reasons, we endeavour to provide that guidance. The approach we set out is one that focuses on justification, offers methodological consistency and reinforces the principle "that reasoned decision-making is the lynchpin of institutional legitimacy": factum of the *amici curiae*, at para. 12.

[75] We pause to note that our colleagues' approach to reasonableness review is not fundamentally dissimilar to ours. Our colleagues emphasize that reviewing courts should respect administrative decision makers and their specialized expertise, should not ask how they themselves would have resolved an issue and should focus on whether the applicant has demonstrated that the decision is unreasonable: paras. 288, 289 and 291. We agree. As we have stated above, at para. 13, reasonableness review finds its starting point in judicial restraint and respects the distinct role of administrative decision makers. Moreover, as explained below, reasonableness review considers all relevant circumstances in order to determine whether the applicant has met their onus.

A. *Procedural Fairness and Substantive Review*

[76] Before turning to a discussion of the proposed approach to reasonableness review, we pause to acknowledge that the requirements of the duty of procedural fairness in a given case — and in particular whether that duty requires a decision maker to give

III. L'exercice du contrôle selon la norme de la décision raisonnable

[73] La jurisprudence de notre Cour en droit administratif a historiquement été axée sur le cadre d'analyse utilisé pour déterminer la norme de contrôle applicable, tout en donnant peu d'indications sur la façon de procéder en pratique à un contrôle fondé sur la norme de la décision raisonnable.

[74] Dans cette partie de nos motifs, nous fournissons de telles indications. L'approche retenue est axée sur la justification, s'appuie sur une cohérence sur le plan méthodologique, et renforce le principe voulant que « la prise de décisions motivées constitue la pierre angulaire de la légitimité des institutions » : mémoire des *amici curiae*, par. 12.

[75] Nous signalons que la manière dont nos collègues abordent le contrôle selon la norme de la décision raisonnable ne diffère pas fondamentalement de la nôtre. Nos collègues affirment que les cours de révision devraient respecter les décideurs administratifs et leur expertise spécialisée; ne devraient pas se demander comment elles auraient elles-mêmes tranché une question; et devraient se concentrer sur la question de savoir si la partie demanderesse a démontré le caractère déraisonnable de la décision : par. 288, 289 et 291. Nous sommes du même avis. Comme nous le mentionnons déjà au par. 13, le contrôle selon la norme de la décision raisonnable a pour point de départ la retenue judiciaire et le respect du rôle distinct des décideurs administratifs. De plus, comme nous l'expliquons ci-dessous, le contrôle selon la norme de la décision raisonnable tient compte de toutes les circonstances pertinentes pour déterminer si la partie demanderesse s'est acquittée de son fardeau.

A. *L'équité procédurale et le contrôle judiciaire sur le fond*

[76] Avant de procéder à l'analyse de la méthode proposée de contrôle selon la norme de la décision raisonnable, nous convenons que les exigences de l'obligation d'équité procédurale dans une affaire donnée — et notamment la question de savoir si

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reasons for its decision — will impact how a court conducts reasonableness review.

[77] It is well established that, as a matter of procedural fairness, reasons are not required for all administrative decisions. The duty of procedural fairness in administrative law is "eminently variable", inherently flexible and context-specific: *Knight v. Indian Head School Division No. 19*, [1990] 1 S.C.R. 653, at p. 682; *Baker v. Canada (Minister of Citizenship and Immigration)*, [1999] 2 S.C.R. 817, at paras. 22-23; *Moreau-Bérubé*, at paras. 74-75; *Dunsmuir*, at para. 79. Where a particular administrative decision-making context gives rise to a duty of procedural fairness, the specific procedural requirements that the duty imposes are determined with reference to all of the circumstances: *Baker*, at para. 21. In *Baker*, this Court set out a non-exhaustive list of factors that inform the content of the duty of procedural fairness in a particular case, one aspect of which is whether written reasons are required. Those factors include: (1) the nature of the decision being made and the process followed in making it; (2) the nature of the statutory scheme; (3) the importance of the decision to the individual or individuals affected; (4) the legitimate expectations of the person challenging the decision; and (5) the choices of procedure made by the administrative decision maker itself: *Baker*, at paras. 23-27; see also *Congrégation des témoins de Jéhovah de St-Jérôme-Lafontaine v. Lafontaine (Village)*, 2004 SCC 48, [2004] 2 S.C.R. 650, at para. 5. Cases in which written reasons tend to be required include those in which the decision-making process gives the parties participatory rights, an adverse decision would have a significant impact on an individual or there is a right of appeal: *Baker*, at para. 43; D. J. M. Brown and the Hon. J. M. Evans, with the assistance of D. Fairlie, *Judicial Review of Administrative Action in Canada* (loose-leaf), vol. 3, at p. 12-54.

[78] In the case at bar and in its companion cases, reasons for the administrative decisions at issue were both required and provided. Our discussion of the proper approach to reasonableness review will therefore focus on the circumstances in which reasons for

cette obligation exige qu'un décideur motive sa décision — auront une incidence sur l'exercice par une cour de justice du contrôle en fonction de la norme de la décision raisonnable.

[77] Il est de jurisprudence constante que l'équité procédurale n'exige pas que toutes les décisions administratives soient motivées. L'obligation d'équité procédurale en droit administratif est « éminemment variable », intrinsèquement souple et tributaire du contexte : *Knight c. Indian Head School Division No. 19*, [1990] 1 R.C.S. 653, p. 682; *Baker c. Canada (Ministre de la Citoyenneté et de l'Immigration)*, [1999] 2 R.C.S. 817, par. 22-23; *Moreau-Bérubé*, par. 74-75; *Dunsmuir*, par. 79. Dans le cas d'un contexte décisionnel administratif qui donne lieu à une obligation d'équité procédurale, les exigences procédurales applicables sont déterminées eu égard à l'ensemble des circonstances : *Baker*, par. 21. Dans l'arrêt *Baker*, la Cour a dressé une liste non exhaustive de facteurs qui servent à définir le contenu de l'obligation d'équité procédurale dans un cas donné, notamment la nécessité de fournir des motifs écrits. Parmi ces facteurs, mentionnons (1) la nature de la décision recherchée et le processus suivi pour y parvenir; (2) la nature du régime législatif; (3) l'importance de la décision pour l'individu ou les individus visés; (4) les attentes légitimes de la personne qui conteste la décision; et (5) les choix de procédure faits par le décideur administratif lui-même : *Baker*, par. 23-27; voir également *Congrégation des témoins de Jéhovah de St-Jérôme-Lafontaine c. Lafontaine (Village)*, 2004 CSC 48, [2004] 2 R.C.S. 650, par. 5. Parmi les cas où des motifs écrits sont généralement nécessaires, on compte les situations où le processus décisionnel accorde aux parties le droit de participer, où une décision défavorable aurait une incidence considérable sur l'intéressé, ou encore celles où il existe un droit d'appel : *Baker*, par. 43; D. J. M. Brown et l'honorable J. M. Evans, avec l'aide de D. Fairlie, *Judicial Review of Administrative Action in Canada* (feuilles mobiles), vol. 3, p. 12-54.

[78] Dans le présent pourvoi et dans les pourvois connexes, il s'agit de situations où il était nécessaire de motiver les décisions administratives contestées et où des motifs ont d'ailleurs été fournis. Notre analyse de la méthode qu'il convient d'utiliser pour effectuer

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an administrative decision are required and available to the reviewing court.

[79] Notwithstanding the important differences between the administrative context and the judicial context, reasons generally serve many of the same purposes in the former as in the latter: *R. v. Sheppard*, 2002 SCC 26, [2002] 1 S.C.R. 869, at paras. 15 and 22-23. Reasons explain how and why a decision was made. They help to show affected parties that their arguments have been considered and demonstrate that the decision was made in a fair and lawful manner. Reasons shield against arbitrariness as well as the perception of arbitrariness in the exercise of public power: *Congrégation des témoins de Jéhovah de St-Jérôme-Lafontaine*, at paras. 12-13. As L'Heureux-Dubé J. noted in *Baker*, "[t]hose affected may be more likely to feel they were treated fairly and appropriately if reasons are given": para. 39, citing S. A. de Smith, J. Jowell and Lord Woolf, *Judicial Review of Administrative Action* (5th ed. 1995), at pp. 459-60. And as Jocelyn Stacey and the Hon. Alice Woolley persuasively write, "public decisions gain their democratic and legal authority through a process of public justification" which includes reasons "that justify [the] decisions [of public decision makers] in light of the constitutional, statutory and common law context in which they operate": "Can Pragmatism Function in Administrative Law?" (2016), 74 *S.C.L.R.* (2d) 211, at p. 220.

[80] The process of drafting reasons also necessarily encourages administrative decision makers to more carefully examine their own thinking and to better articulate their analysis in the process: *Baker*, at para. 39. This is what Justice Sharpe describes — albeit in the judicial context — as the "discipline of reasons": *Good Judgment: Making Judicial Decisions* (2018), at p. 134; see also *Sheppard*, at para. 23.

un contrôle selon la norme de la décision raisonnable est donc axée sur la révision dans des circonstances où la décision administrative doit être motivée et où la cour de révision dispose des motifs à l'appui de ces décisions.

[79] Nonobstant les différences importantes qui existent entre le contexte administratif et le contexte judiciaire, les motifs répondent à bon nombre des mêmes besoins dans les deux contextes : *R. c. Sheppard*, 2002 CSC 26, [2002] 1 R.C.S. 869, par. 15 et 22-23. Les motifs donnés par les décideurs administratifs servent à expliquer le processus décisionnel et la raison d'être de la décision en cause. Ils permettent de montrer aux parties concernées que leurs arguments ont été pris en compte et démontrent que la décision a été rendue de manière équitable et licite. Les motifs servent de bouclier contre l'arbitraire et la perception d'arbitraire dans l'exercice d'un pouvoir public : *Congrégation des témoins de Jéhovah de St-Jérôme-Lafontaine*, par. 12-13. Comme l'a fait remarquer la juge L'Heureux-Dubé dans l'arrêt *Baker*, « [i]l est plus probable que les personnes touchées ont l'impression d'être traitées avec équité et de façon appropriée si des motifs sont fournis » : par. 39, citant S. A. de Smith, J. Jowell et lord Woolf, *Judicial Review of Administrative Action* (5e éd. 1995), p. 459-460. Et comme l'écrivent de manière convaincante Jocelyn Stacey et l'honorable Alice Woolley, [TRADUCTION] « les décisions rendues par les pouvoirs publics acquièrent leur autorité sur le plan juridique et démocratique par le biais d'un processus de justification publique » au moyen duquel les décideurs « motivent leurs décisions en tenant compte du contexte constitutionnel, législatif et de common law dans lequel ils œuvrent » : « Can Pragmatism Function in Administrative Law? » (2016), 74 *S.C.L.R.* (2d) 211, p. 220.

[80] Qui plus est, le processus de rédaction des motifs incite nécessairement le décideur administratif à étudier soigneusement son propre raisonnement et à mieux formuler son analyse : *Baker*, par. 39. C'est ce que le juge Sharpe désignait — quoique dans le contexte judiciaire — comme [TRADUCTION] « la discipline de motiver une décision » : *Good Judgment : Making Judicial Decisions* (2018), p. 134; voir aussi *Sheppard*, par. 23.

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[81] Reasons facilitate meaningful judicial review by shedding light on the rationale for a decision: *Baker*, at para. 39. In *Newfoundland and Labrador Nurses' Union v. Newfoundland and Labrador (Treasury Board)*, 2011 SCC 62, [2011] 3 S.C.R. 708, the Court reaffirmed that "the purpose of reasons, when they are required, is to demonstrate 'justification, transparency and intelligibility'": para. 1, quoting *Dunsmuir*, at para. 47; see also *Suresh v. Canada (Minister of Citizenship and Immigration)*, 2002 SCC 1, [2002] 1 S.C.R. 3, at para. 126. The starting point for our analysis is therefore that where reasons are required, they are the primary mechanism by which administrative decision makers show that their decisions are reasonable — both to the affected parties and to the reviewing courts. It follows that the provision of reasons for an administrative decision may have implications for its legitimacy, including in terms both of whether it is procedurally fair and of whether it is substantively reasonable.

B. *Reasonableness Review Is Concerned With the Decision-making Process and Its Outcomes*

[82] Reasonableness review aims to give effect to the legislature's intent to leave certain decisions with an administrative body while fulfilling the constitutional role of judicial review to ensure that exercises of state power are subject to the rule of law: see *Dunsmuir*, at paras. 27-28 and 48; *Catalyst Paper Corp. v. North Cowichan (District)*, 2012 SCC 2, [2012] 1 S.C.R. 5, at para. 10; *Reference re Remuneration of Judges of the Provincial Court of Prince Edward Island*, [1997] 3 S.C.R. 3, at para. 10.

[83] It follows that the focus of reasonableness review must be on the decision actually made by the decision maker, including both the decision maker's reasoning process and the outcome. The role of courts in these circumstances is to *review*, and they are, at least as a general rule, to refrain from deciding the issue themselves. Accordingly, a court applying the reasonableness standard does not ask what

[81] Les motifs favorisent un contrôle judiciaire valable en mettant en lumière la justification de la décision : *Baker*, par. 39. Dans l'arrêt *Newfoundland and Labrador Nurses' Union c. Terre-Neuve-et-Labrador (Conseil du Trésor)*, 2011 CSC 62, [2011] 3 R.C.S. 708, la Cour a réaffirmé que « l'objet des motifs, dans les cas où il faut en exposer, est d'établir "la justification de la décision [ainsi que] la transparence et [. . .] l'intelligibilité du processus décisionnel » : par. 1, citant *Dunsmuir*, par. 47; voir aussi *Suresh c. Canada (Ministre de la Citoyenneté et de l'Immigration)*, 2002 CSC 1, [2002] 1 R.C.S. 3, par. 126. Notre analyse prend donc comme point de départ que, lorsque des motifs sont requis, ceux-ci constituent le mécanisme principal par lequel les décideurs administratifs démontrent le caractère raisonnable de leurs décisions, tant aux parties touchées qu'aux cours de révision. En conséquence, la communication des motifs à l'appui d'une décision administrative est susceptible d'avoir des répercussions sur sa légitimité, à la fois au regard de l'équité procédurale et du caractère raisonnable de ceux-ci sur le fond.

B. *Le contrôle selon la norme de la décision raisonnable porte sur le processus décisionnel et ses résultats*

[82] Le contrôle selon la norme de la décision raisonnable vise à donner effet à l'intention du législateur de confier certaines décisions à un organisme administratif, tout en exerçant la fonction constitutionnelle du contrôle judiciaire qui vise à s'assurer que l'exercice du pouvoir étatique est assujetti à la primauté du droit : voir *Dunsmuir*, par. 27-28 et 48; *Catalyst Paper Corp. c. North Cowichan (District)*, 2012 CSC 2, [2012] 1 R.C.S. 5, par. 10; *Renvoi relatif à la rémunération des juges de la Cour provinciale de l'Île-du-Prince-Édouard*, [1997] 3 R.C.S. 3, par. 10.

[83] Il s'ensuit que le contrôle en fonction de la norme de la décision raisonnable doit s'intéresser à la décision effectivement rendue par le décideur, notamment au raisonnement suivi et au résultat de la décision. Le rôle des cours de justice consiste, en pareil cas, à *réviser* la décision et, en général à tout le moins, à s'abstenir de trancher elles-mêmes la question en litige. Une cour de justice qui applique la norme de

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decision it would have made in place of that of the administrative decision maker, attempt to ascertain the "range" of possible conclusions that would have been open to the decision maker, conduct a *de novo* analysis or seek to determine the "correct" solution to the problem. The Federal Court of Appeal noted in *Delios v. Canada (Attorney General)*, 2015 FCA 117, 472 N.R. 171, that, "as reviewing judges, we do not make our own yardstick and then use that yardstick to measure what the administrator did": para. 28; see also *Ryan*, at paras. 50-51. Instead, the reviewing court must consider only whether the decision made by the administrative decision maker — including both the rationale for the decision and the outcome to which it led — was unreasonable.

[84] As explained above, where the administrative decision maker has provided written reasons, those reasons are the means by which the decision maker communicates the rationale for its decision. A principled approach to reasonableness review is one which puts those reasons first. A reviewing court must begin its inquiry into the reasonableness of a decision by examining the reasons provided with "respectful attention" and seeking to understand the reasoning process followed by the decision maker to arrive at its conclusion: see *Dunsmuir*, at para. 48, quoting D. Dyzenhaus, "The Politics of Deference: Judicial Review and Democracy", in M. Taggart, ed., *The Province of Administrative Law* (1997), 279, at p. 286.

[85] Developing an understanding of the reasoning that led to the administrative decision enables a reviewing court to assess whether the decision as a whole is reasonable. As we will explain in greater detail below, a reasonable decision is one that is based on an internally coherent and rational chain of analysis and that is justified in relation to the facts and law that constrain the decision maker. The reasonableness standard requires that a reviewing court defer to such a decision.

[86] Attention to the decision maker's reasons is part of how courts demonstrate respect for the decision-making process: see *Dunsmuir*, at paras. 47-49. In *Dunsmuir*, this Court explicitly stated that the court

contrôle de la décision raisonnable ne se demande donc pas quelle décision elle aurait rendue à la place du décideur administratif, ne tente pas de prendre en compte l'« éventail » des conclusions qu'aurait pu tirer le décideur, ne se livre pas à une analyse *de novo*, et ne cherche pas à déterminer la solution « correcte » au problème. Dans l'arrêt *Delios c. Canada (Procureur général)*, 2015 CAF 117, la Cour d'appel fédérale a signalé que « le juge réformateur n'établit pas son propre critère pour ensuite jauger ce qu'a fait l'administrateur » : par. 28 (CanLII); voir aussi *Ryan*, par. 50-51. La cour de révision n'est plutôt appelée qu'à décider du caractère raisonnable de la décision rendue par le décideur administratif — ce qui inclut à la fois le raisonnement suivi et le résultat obtenu.

[84] Comme nous l'avons expliqué précédemment, les motifs écrits fournis par le décideur administratif servent à communiquer la justification de sa décision. Toute méthode raisonnée de contrôle selon la norme de la décision raisonnable s'intéresse avant tout aux motifs de la décision. Dans le cadre de son analyse du caractère raisonnable d'une décision, une cour de révision doit d'abord examiner les motifs donnés avec « une attention respectueuse », et chercher à comprendre le fil du raisonnement suivi par le décideur pour en arriver à sa conclusion : voir *Dunsmuir*, par. 48, citant D. Dyzenhaus, « The Politics of Deference : Judicial Review and Democracy », dans M. Taggart, dir., *The Province of Administrative Law* (1997), 279, p. 286.

[85] Comprendre le raisonnement qui a mené à la décision administrative permet à la cour de révision de déterminer si la décision dans son ensemble est raisonnable. Comme nous l'expliquerons davantage, une décision raisonnable doit être fondée sur une analyse intrinsèquement cohérente et rationnelle et est justifiée au regard des contraintes juridiques et factuelles auxquelles le décideur est assujetti. La norme de la décision raisonnable exige de la cour de justice qu'elle fasse preuve de déférence envers une telle décision.

[86] L'attention accordée aux motifs formulés par le décideur est une manifestation de l'attitude de respect dont font preuve les cours de justice envers le processus décisionnel : voir *Dunsmuir*, par. 47-49.

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conducting a reasonableness review is concerned with "the qualities that make a decision reasonable, referring both to the process of articulating the reasons and to outcomes": para. 47. Reasonableness, according to *Dunsmuir*, "is concerned mostly with the existence of justification, transparency and intelligibility within the decision-making process", as well as "with whether the decision falls within a range of possible, acceptable outcomes which are defensible in respect of the facts and law": *ibid*. In short, it is not enough for the outcome of a decision to be *justifiable*. Where reasons for a decision are required, the decision must also be *justified*, by way of those reasons, by the decision maker to those to whom the decision applies. While some outcomes may be so at odds with the legal and factual context that they could never be supported by intelligible and rational reasoning, an otherwise reasonable outcome also cannot stand if it was reached on an improper basis.

[87] This Court's jurisprudence since *Dunsmuir* should not be understood as having shifted the focus of reasonableness review away from a concern with the reasoning process and toward a nearly exclusive focus on the *outcome* of the administrative decision under review. Indeed, that a court conducting a reasonableness review properly considers both the outcome of the decision and the reasoning process that led to that outcome was recently reaffirmed in *Delta Air Lines Inc. v. Lukács*, 2018 SCC 2, [2018] 1 S.C.R. 6, at para. 12. In that case, although the outcome of the decision at issue may not have been unreasonable in the circumstances, the decision was set aside because the outcome had been arrived at on the basis of an unreasonable chain of analysis. This approach is consistent with the direction in *Dunsmuir* that judicial review is concerned with *both* outcome *and* process. To accept otherwise would undermine, rather than demonstrate respect toward, the institutional role of the administrative decision maker.

C. *Reasonableness Is a Single Standard That Accounts for Context*

[88] In any attempt to develop a coherent and unified approach to judicial review, the sheer variety of

Il ressort explicitement de l'arrêt *Dunsmuir* que la cour de justice qui procède à un contrôle selon la norme de la décision raisonnable « se demande dès lors si la décision et sa justification possèdent les attributs de la raisonnabilité » : par. 47. Selon l'arrêt *Dunsmuir*, le caractère raisonnable « tient principalement à la justification de la décision, à la transparence et à l'intelligibilité du processus décisionnel, ainsi qu'à l'appartenance de la décision aux issues possibles acceptables pouvant se justifier au regard des faits et du droit » : *ibid*. En somme, il ne suffit pas que la décision soit *justifiable*. Dans les cas où des motifs s'imposent, le décideur doit également, au moyen de ceux-ci, *justifier* sa décision auprès des personnes auxquelles elle s'applique. Si certains résultats peuvent se détacher du contexte juridique et factuel au point de ne jamais s'appuyer sur un raisonnement intelligible et rationnel, un résultat par ailleurs raisonnable ne saurait être non plus tenu pour valide s'il repose sur un fondement erroné.

[87] La jurisprudence de notre Cour depuis l'arrêt *Dunsmuir* ne doit pas être interprétée comme ayant délaissé le point de mire du contrôle selon la norme de la décision raisonnable axé sur le raisonnement pour dorénavant s'attarder presque exclusivement au *résultat* de la décision administrative sous examen. D'ailleurs, le contrôle en fonction de la norme de la décision raisonnable tient dûment compte à la fois du résultat de la décision et du raisonnement à l'origine de ce résultat, comme la Cour l'a récemment rappelé dans l'arrêt *Delta Air Lines Inc. c. Lukács*, 2018 CSC 2, [2018] 1 R.C.S. 6, par. 12. Dans cette affaire, même si le résultat de la décision n'était peut-être pas déraisonnable eu égard aux circonstances, la décision a été infirmée parce que l'analyse ayant débouché sur ce résultat était déraisonnable. Cette façon de voir s'inscrit dans la foulée de la directive de l'arrêt *Dunsmuir* voulant que le contrôle judiciaire porte *à la fois* sur le résultat *et* sur le processus. Une approche différente compromettrait le rôle institutionnel du décideur administratif plutôt que de le respecter.

C. *La norme de la décision raisonnable est une norme unique qui tient compte du contexte*

[88] Lorsqu'on tente d'élaborer une méthode cohérente et unifiée de contrôle judiciaire, la diversité

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decisions and decision makers that such an approach must account for poses an inescapable challenge. The administrative decision makers whose decisions may be subject to judicial review include specialized tribunals exercising adjudicative functions, independent regulatory bodies, ministers, front-line decision makers, and more. Their decisions vary in complexity and importance, ranging from the routine to the life-altering. These include matters of "high policy" on the one hand and "pure law" on the other. Such decisions will sometimes involve complex technical considerations. At other times, common sense and ordinary logic will suffice.

[89] Despite this diversity, reasonableness remains a single standard, and elements of a decision's context do not modulate the standard or the degree of scrutiny by the reviewing court. Instead, the particular context of a decision constrains what will be reasonable for an administrative decision maker to decide in a given case. This is what it means to say that "[r]easonableness is a single standard that takes its colour from the context": *Khosa*, at para. 59; *Catalyst*, at para. 18; *Halifax (Regional Municipality) v. Nova Scotia (Human Rights Commission)*, 2012 SCC 10, [2012] 1 S.C.R. 364, at para. 44; *Wilson*, at para. 22, per Abella J.; *Canada (Attorney General) v. Igloo Vikski Inc.*, 2016 SCC 38, [2016] 2 S.C.R. 80, at para. 57, per Côté J., dissenting but not on this point; *Law Society of British Columbia v. Trinity Western University*, 2018 SCC 32, [2018] 2 S.C.R. 293, at para. 53.

[90] The approach to reasonableness review that we articulate in these reasons accounts for the diversity of administrative decision making by recognizing that what is reasonable in a given situation will always depend on the constraints imposed by the legal and factual context of the particular decision under review. These contextual constraints dictate the limits and contours of the space in which the decision maker may act and the types of solutions it may adopt. The fact that the contextual constraints operating on an administrative decision maker may vary from one decision to another does not pose a

des décisions et des décideurs que doit prendre en compte cette méthode pose en soi un défi inéluctable. Les décideurs dont les décisions peuvent faire l'objet d'un contrôle judiciaire vont des tribunaux spécialisés exerçant des attributions judiciaires aux organismes de réglementation indépendants, aux ministres, aux décideurs de première ligne et plus encore. Leurs décisions varient en complexité et en importance, allant des décisions banales à celles qui changent le cours d'une vie. Elles visent, d'une part, des questions « hautement politiques » et, d'autre part, des questions de « droit pur ». Ces décisions font parfois intervenir des considérations techniques complexes. À d'autres moments, le bon sens et la logique ordinaire suffisent.

[89] Malgré cette diversité, la norme de la décision raisonnable demeure une norme unique, et les éléments du contexte entourant une décision n'altèrent pas cette norme ou le degré d'examen que doit appliquer une cour de révision. Le contexte particulier d'une décision circonscrit plutôt la latitude du décideur administratif en matière de décision raisonnable dans un cas donné. C'est ce que l'on entend quand on affirme que « [l]a raisonnabilité constitue une norme unique qui s'adapte au contexte » : *Khosa*, par. 59; *Catalyst*, par. 18; *Halifax (Regional Municipality) c. Nouvelle-Écosse (Human Rights Commission)*, 2012 CSC 10, [2012] 1 R.C.S. 364, par. 44; *Wilson*, par. 22, la juge Abella; *Canada (Procureur général) c. Igloo Vikski Inc.*, 2016 CSC 38, [2016] 2 R.C.S. 80, par. 57, la juge Côté, dissidente mais non sur ce point; *Law Society of British Columbia c. Trinity Western University*, 2018 CSC 32, [2018] 2 R.C.S. 293, par. 53.

[90] La méthode de contrôle selon la norme de la décision raisonnable que nous décrivons dans les présents motifs tient compte de la diversité des décisions administratives en reconnaissant que ce qui est raisonnable dans un cas donné dépend toujours des contraintes juridiques et factuelles propres au contexte de la décision particulière sous examen. Ces contraintes d'ordre contextuel cernent les limites et les contours de l'espace à l'intérieur duquel le décideur peut agir, ainsi que les types de solution qu'il peut retenir. Le fait que ces contraintes d'ordre contextuel imposées au décideur administratif puissent

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problem for the reasonableness standard, because each decision must be both justified by the administrative body and evaluated by reviewing courts in relation to its own particular context.

D. *Formal Reasons for a Decision Should Be Read in Light of the Record and With Due Sensitivity to the Administrative Setting in Which They Were Given*

[91] A reviewing court must bear in mind that the written reasons given by an administrative body must not be assessed against a standard of perfection. That the reasons given for a decision do "not include all the arguments, statutory provisions, jurisprudence or other details the reviewing judge would have preferred" is not on its own a basis to set the decision aside: *Newfoundland Nurses*, at para. 16. The review of an administrative decision can be divorced neither from the institutional context in which the decision was made nor from the history of the proceedings.

[92] Administrative decision makers cannot always be expected to deploy the same array of legal techniques that might be expected of a lawyer or judge — nor will it always be necessary or even useful for them to do so. Instead, the concepts and language employed by administrative decision makers will often be highly specific to their fields of experience and expertise, and this may impact both the form and content of their reasons. These differences are not necessarily a sign of an unreasonable decision — indeed, they may be indicative of a decision maker's strength within its particular and specialized domain. "Administrative justice" will not always look like "judicial justice", and reviewing courts must remain acutely aware of that fact.

[93] An administrative decision maker may demonstrate through its reasons that a given decision was made by bringing that institutional expertise and experience to bear: see *Dunsmuir*, at para. 49. In conducting reasonableness review, judges should be attentive to the application by decision makers of specialized knowledge, as demonstrated by their reasons.

varier d'une décision à l'autre ne pose pas problème pour la norme de la décision raisonnable parce que chaque décision doit être à la fois justifiée par l'organisme administratif et évaluée par la cour de révision en fonction de son propre contexte particulier.

D. *Les motifs écrits d'une décision devraient être interprétés à la lumière du dossier et en tenant dûment compte du contexte administratif dans lequel ils sont fournis*

[91] Une cour de révision doit se rappeler que les motifs écrits fournis par un organisme administratif ne doivent pas être jugés au regard d'une norme de perfection. Le fait que les motifs de la décision « ne fassent pas référence à tous les arguments, dispositions législatives, précédents ou autres détails que le juge siégeant en révision aurait voulu y lire » ne constitue pas un fondement justifiant à lui seul d'infirmer la décision : *Newfoundland Nurses*, par. 16. On ne peut dissocier non plus le contrôle d'une décision administrative du cadre institutionnel dans lequel elle a été rendue ni de l'historique de l'instance.

[92] On ne peut pas toujours s'attendre à ce que les décideurs administratifs déploient toute la gamme de techniques juridiques auxquelles on peut s'attendre de la part d'un avocat ou d'un juge et il ne sera pas toujours nécessaire, ni même utile, de le faire. En réalité, les concepts et le vocabulaire employés par ces décideurs sont souvent, dans une très large mesure, propres à leur champ d'expertise et d'expérience, et ils influent tant sur la forme que sur la teneur de leurs motifs. Ces différences ne sont pas forcément le signe d'une décision déraisonnable; en fait, elles peuvent indiquer la force du décideur dans son champ d'expertise précis. La « justice administrative » ne ressemble pas toujours à la « justice judiciaire » et les cours de révision doivent en demeurer pleinement conscientes.

[93] Par ses motifs, le décideur administratif peut démontrer qu'il a rendu une décision donnée en mettant à contribution son expertise et son expérience institutionnelle : voir *Dunsmuir*, par. 49. Lors du contrôle selon la norme de la décision raisonnable, le juge doit être attentif à la manière dont le décideur administratif met à profit son expertise, tel qu'en font

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Respectful attention to a decision maker's demonstrated expertise may reveal to a reviewing court that an outcome that might be puzzling or counterintuitive on its face nevertheless accords with the purposes and practical realities of the relevant administrative regime and represents a reasonable approach given the consequences and the operational impact of the decision. This demonstrated experience and expertise may also explain why a given issue is treated in less detail.

[94] The reviewing court must also read the decision maker's reasons in light of the history and context of the proceedings in which they were rendered. For example, the reviewing court might consider the evidence before the decision maker, the submissions of the parties, publicly available policies or guidelines that informed the decision maker's work, and past decisions of the relevant administrative body. This may explain an aspect of the decision maker's reasoning process that is not apparent from the reasons themselves, or may reveal that an apparent shortcoming in the reasons is not, in fact, a failure of justification, intelligibility or transparency. Opposing parties may have made concessions that had obviated the need for the decision maker to adjudicate on a particular issue; the decision maker may have followed a well-established line of administrative case law that no party had challenged during the proceedings; or an individual decision maker may have adopted an interpretation set out in a public interpretive policy of the administrative body of which he or she is a member.

[95] That being said, reviewing courts must keep in mind the principle that the exercise of public power must be justified, intelligible and transparent, not in the abstract, but to the individuals subject to it. It would therefore be unacceptable for an administrative decision maker to provide an affected party formal reasons that fail to justify its decision, but nevertheless expect that its decision would be upheld on the basis of internal records that were not available to that party.

[96] Where, even if the reasons given by an administrative decision maker for a decision are read with

foi les motifs de ce dernier. L'attention respectueuse accordée à l'expertise établie du décideur peut indiquer à une cour de révision qu'un résultat qui semble déroutant ou contre-intuitif à première vue est néanmoins conforme aux objets et aux réalités pratiques du régime administratif en cause et témoigne d'une approche raisonnable compte tenu des conséquences et des effets concrets de la décision. Lorsqu'établies, cette expérience et cette expertise peuvent elles aussi expliquer pourquoi l'analyse d'une question donnée est moins étoffée.

[94] La cour de révision doit également interpréter les motifs du décideur en fonction de l'historique et du contexte de l'instance dans laquelle ils ont été rendus. Elle peut considérer, par exemple, la preuve dont disposait le décideur, les observations des parties, les politiques ou lignes directrices accessibles au public dont a tenu compte le décideur et les décisions antérieures de l'organisme administratif en question. Cela peut expliquer un aspect du raisonnement du décideur qui ne ressort pas à l'évidence des motifs eux-mêmes; cela peut aussi révéler que ce qui semble être une lacune des motifs ne constitue pas en définitive un manque de justification, d'intelligibilité ou de transparence. Ainsi, les parties adverses ont pu faire des concessions pour éviter que le décideur n'ait à trancher une question. De même, un décideur a pu suivre une jurisprudence administrative bien établie sur une question qu'aucune partie n'a contestée au cours de l'instance. Ou encore, un décideur a pu adopter une interprétation énoncée dans une politique d'interprétation publiée par l'organisme administratif dont il fait partie.

[95] Cela dit, les cours de révision doivent garder à l'esprit le principe suivant lequel l'exercice de tout pouvoir public doit être justifié, intelligible et transparent non pas dans l'abstrait, mais pour l'individu qui en fait l'objet. Il serait donc inacceptable qu'un décideur administratif communique à une partie concernée des motifs écrits qui ne justifient pas sa décision, mais s'attende néanmoins à ce que sa décision soit confirmée sur la base de dossiers internes qui n'étaient pas à la disposition de cette partie.

[96] Lorsque, même s'ils sont interprétés en tenant compte du contexte institutionnel et à la lumière du

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sensitivity to the institutional setting and in light of the record, they contain a fundamental gap or reveal that the decision is based on an unreasonable chain of analysis, it is not ordinarily appropriate for the reviewing court to fashion its own reasons in order to buttress the administrative decision. Even if the outcome of the decision could be reasonable under different circumstances, it is not open to a reviewing court to disregard the flawed basis for a decision and substitute its own justification for the outcome: *Delta Air Lines*, at paras. 26-28. To allow a reviewing court to do so would be to allow an administrative decision maker to abdicate its responsibility to justify to the affected party, in a manner that is transparent and intelligible, the basis on which it arrived at a particular conclusion. This would also amount to adopting an approach to reasonableness review focused solely on the outcome of a decision, to the exclusion of the rationale for that decision. To the extent that cases such as *Newfoundland Nurses* and *Alberta Teachers* have been taken as suggesting otherwise, such a view is mistaken.

[97] Indeed, *Newfoundland Nurses* is far from holding that a decision maker's grounds or rationale for a decision is irrelevant. It instead tells us that close attention must be paid to a decision maker's written reasons and that they must be read holistically and contextually, for the very purpose of understanding the basis on which a decision was made. We agree with the observations of Rennie J. in *Komolafe v. Canada (Minister of Citizenship and Immigration)*, 2013 FC 431, 16 Imm. L.R. (4th) 267, at para. 11:

> *Newfoundland Nurses* is not an open invitation to the Court to provide reasons that were not given, nor is it licence to guess what findings might have been made or to speculate as to what the tribunal might have been thinking. This is particularly so where the reasons are silent on a critical issue. It is ironic that *Newfoundland Nurses*, a case which at its core is about deference and standard of review, is urged as authority for the supervisory court to do the task that the decision maker did not do, to supply the reasons that might have been given and make findings of fact that were not made. This is to turn the jurisprudence on its head. *Newfoundland Nurses* allows reviewing courts

dossier, les motifs fournis par l'organisme administratif pour justifier sa décision comportent une lacune fondamentale ou révèlent une analyse déraisonnable, il ne convient habituellement pas que la cour de révision élabore ses propres motifs pour appuyer la décision administrative. Même si le résultat de la décision pourrait sembler raisonnable dans des circonstances différentes, il n'est pas loisible à la cour de révision de faire abstraction du fondement erroné de la décision et d'y substituer sa propre justification du résultat : *Delta Air Lines*, par. 26-28. Autoriser une cour de révision à agir ainsi reviendrait à permettre à un décideur de se dérober à son obligation de justifier, de manière transparente et intelligible pour la personne visée, le fondement pour lequel il est parvenu à une conclusion donnée. Cela reviendrait également à adopter une méthode de contrôle selon la norme de la décision raisonnable qui serait axée uniquement sur le résultat de la décision, à l'exclusion de la justification de cette décision. Dans la mesure où des arrêts comme *Newfoundland Nurses* et *Alberta Teachers* ont été compris comme appuyant une telle conception, cette compréhension est erronée.

[97] En effet, l'arrêt *Newfoundland Nurses* est loin d'établir que la justification donnée par le décideur à l'appui de sa décision n'est pas pertinente. Cet arrêt nous enseigne plutôt qu'il faut accorder une attention particulière aux motifs écrits du décideur et les interpréter de façon globale et contextuelle. L'objectif est justement de comprendre le fondement sur lequel repose la décision. Nous souscrivons aux observations suivantes du juge Rennie dans l'affaire *Komolafe c. Canada (Ministre de la Citoyenneté et de l'Immigration)*, 2013 CF 431, par. 11 (CanLII) :

> L'arrêt *Newfoundland Nurses* ne donne pas à la [cour] toute la latitude voulue pour fournir des motifs qui n'ont pas été donnés, ni ne l'autorise à deviner quelles conclusions auraient pu être tirées ou à émettre des hypothèses sur ce que le tribunal a pu penser. C'est particulièrement le cas quand les motifs passent sous silence une question essentielle. Il est ironique que l'arrêt *Newfoundland Nurses*, une affaire qui concerne essentiellement la déférence et la norme de contrôle, soit invoqué comme le précédent qui commanderait [à la cour] ayant le pouvoir de surveillance de faire le travail omis par le décideur, de fournir les motifs qui auraient pu être donnés et de formuler les conclusions

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to connect the dots on the page where the lines, and the direction they are headed, may be readily drawn.

[98] As for *Alberta Teachers*, it concerned a very specific and exceptional circumstance in which the reviewing court had exercised its discretion to consider a question of statutory interpretation on judicial review, even though that question had not been raised before the administrative decision maker and, as a result, no reasons had been given on that issue: paras. 22-26. Furthermore, it was agreed that the ultimate decision maker — the Information and Privacy Commissioner's delegate — had applied a well-established interpretation of the statutory provision in question and that, had she been asked for reasons to justify her interpretation, she would have adopted reasons the Commissioner had given in past decisions. In other words, the reasons of the Commissioner that this Court relied on to find that the administrative decision was reasonable were not merely reasons that *could* have been offered, in an abstract sense, but reasons that *would* have been offered had the issue been raised before the decision maker. Far from suggesting in *Alberta Teachers* that reasonableness review is concerned primarily with outcome, as opposed to rationale, this Court rejected the position that a reviewing court is entitled to "reformulate a tribunal's decision in a way that casts aside an unreasonable chain of analysis in favour of the court's own rationale for the result": para. 54, quoting *Petro-Canada v. British Columbia (Workers' Compensation Board)*, 2009 BCCA 396, 276 B.C.A.C. 135, at paras. 53 and 56. In *Alberta Teachers*, this Court also reaffirmed the importance of giving proper reasons and reiterated that "deference under the reasonableness standard is best given effect when administrative decision makers provide intelligible and transparent justification for their decisions, and when courts ground their review of the decision in the reasons provided": para. 54. Where a decision maker's rationale for an essential element of the decision is not addressed in the reasons and cannot be inferred from the record, the decision will generally fail to meet the requisite standard of justification, transparency and intelligibility.

de fait qui n'ont pas été tirées. C'est appliquer la jurisprudence à l'envers. L'arrêt *Newfoundland Nurses* permet aux cours de [révision] de relier les points sur la page quand les lignes, et la direction qu'elles prennent, peuvent être facilement discernées.

[98] En ce qui concerne l'arrêt *Alberta Teachers*, il concernait un contrôle judiciaire exercé dans des circonstances très précises et exceptionnelles : la question d'interprétation législative en litige n'avait jamais été soumise au décideur administratif et, en conséquence, ce dernier n'avait communiqué aucuns motifs à cet égard : par. 22-26. De plus, il avait été convenu que la décideuse — la déléguée du commissaire à l'information et à la protection de la vie privée — avait appliqué une interprétation bien établie de la disposition législative pertinente, et que si on lui avait demandé de motiver son interprétation, elle aurait souscrit aux motifs fournis par le commissaire dans des décisions antérieures. En d'autres termes, les motifs du commissaire invoqués par notre Cour pour conclure que la décision sous examen était raisonnable n'étaient pas simplement les motifs qui auraient *pu* être fournis, dans l'abstrait, mais ceux qui *auraient* été fournis si la question avait été soulevée devant la décideuse. Loin de suggérer dans l'arrêt *Alberta Teachers* que le contrôle selon la norme de la décision raisonnable porte principalement sur le résultat plutôt que sur la justification, notre Cour a rejeté la position selon laquelle la cour de révision a le pouvoir de « reformuler la décision en substituant à l'analyse qu'elle juge déraisonnable sa propre justification du résultat » : par. 54, citant *Petro-Canada c. British Columbia (Workers' Compensation Board)*, 2009 BCCA 396, 276 B.C.A.C. 135, par. 53 et 56. Dans l'arrêt *Alberta Teachers*, notre Cour a aussi confirmé l'importance de motiver adéquatement une décision et rappelé que « la déférence inhérente à la norme de la raisonnabilité se manifeste optimalement lorsqu'une décision administrative est justifiée de façon intelligible et transparente et que la juridiction de révision contrôle la décision à partir des motifs qui l'étayent » : par. 54. Lorsque le décideur omet de justifier, dans les motifs, un élément essentiel de sa décision, et que cette justification ne saurait être déduite du dossier de l'instance, la décision ne satisfait pas, en règle générale, à la norme de justification, de transparence et d'intelligibilité.

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E. *A Reasonable Decision Is One That Is Both Based on an Internally Coherent Reasoning and Justified in Light of the Legal and Factual Constraints That Bear on the Decision*

[99] A reviewing court must develop an understanding of the decision maker's reasoning process in order to determine whether the decision as a whole is reasonable. To make this determination, the reviewing court asks whether the decision bears the hallmarks of reasonableness — justification, transparency and intelligibility — and whether it is justified in relation to the relevant factual and legal constraints that bear on the decision: *Dunsmuir*, at paras. 47 and 74; *Catalyst*, at para. 13.

[100] The burden is on the party challenging the decision to show that it is unreasonable. Before a decision can be set aside on this basis, the reviewing court must be satisfied that there are sufficiently serious shortcomings in the decision such that it cannot be said to exhibit the requisite degree of justification, intelligibility and transparency. Any alleged flaws or shortcomings must be more than merely superficial or peripheral to the merits of the decision. It would be improper for a reviewing court to overturn an administrative decision simply because its reasoning exhibits a minor misstep. Instead, the court must be satisfied that any shortcomings or flaws relied on by the party challenging the decision are sufficiently central or significant to render the decision unreasonable.

[101] What makes a decision unreasonable? We find it conceptually useful here to consider two types of fundamental flaws. The first is a failure of rationality internal to the reasoning process. The second arises when a decision is in some respect untenable in light of the relevant factual and legal constraints that bear on it. There is, however, no need for reviewing courts to categorize failures of reasonableness as belonging to one type or the other. Rather, we use these descriptions simply as a convenient way to discuss the types of issues that may show a decision to be unreasonable.

E. *Une décision raisonnable est à la fois fondée sur un raisonnement intrinsèquement cohérent et justifiée à la lumière des contraintes juridiques et factuelles qui ont une incidence sur la décision*

[99] La cour de révision doit s'assurer de bien comprendre le raisonnement suivi par le décideur afin de déterminer si la décision dans son ensemble est raisonnable. Elle doit donc se demander si la décision possède les caractéristiques d'une décision raisonnable, soit la justification, la transparence et l'intelligibilité, et si la décision est justifiée au regard des contraintes factuelles et juridiques pertinentes qui ont une incidence sur celle-ci : *Dunsmuir*, par. 47 et 74; *Catalyst*, par. 13.

[100] Il incombe à la partie qui conteste la décision d'en démontrer le caractère déraisonnable. Avant de pouvoir infirmer la décision pour ce motif, la cour de révision doit être convaincue qu'elle souffre de lacunes graves à un point tel qu'on ne peut pas dire qu'elle satisfait aux exigences de justification, d'intelligibilité et de transparence. Les lacunes ou insuffisances reprochées ne doivent pas être simplement superficielles ou accessoires par rapport au fond de la décision. Il ne conviendrait pas que la cour de révision infirme une décision administrative pour la simple raison que son raisonnement est entaché d'une erreur mineure. La cour de justice doit plutôt être convaincue que la lacune ou la déficience qu'invoque la partie contestant la décision est suffisamment capitale ou importante pour rendre cette dernière déraisonnable.

[101] Qu'est-ce qui rend une décision déraisonnable? Il nous semble utile ici, d'un point de vue conceptuel, de nous arrêter à deux catégories de lacunes fondamentales. La première est le manque de logique interne du raisonnement. La seconde se présente dans le cas d'une décision indéfendable sous certains rapports compte tenu des contraintes factuelles et juridiques pertinentes qui ont une incidence sur la décision. Il n'est toutefois pas nécessaire que les cours de révision déterminent si les problèmes qui rendent la décision déraisonnable appartiennent à l'une ou à l'autre catégorie. Ces désignations offrent plutôt un moyen pratique d'analyser les types de questions qui peuvent révéler qu'une décision est déraisonnable.

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(1) A Reasonable Decision Is Based on an Internally Coherent Reasoning

[102] To be reasonable, a decision must be based on reasoning that is both rational and logical. It follows that a failure in this respect may lead a reviewing court to conclude that a decision must be set aside. Reasonableness review is not a "line-by-line treasure hunt for error": *Irving Pulp & Paper*, at para. 54, citing *Newfoundland Nurses*, at para. 14. However, the reviewing court must be able to trace the decision maker's reasoning without encountering any fatal flaws in its overarching logic, and it must be satisfied that "there is [a] line of analysis within the given reasons that could reasonably lead the tribunal from the evidence before it to the conclusion at which it arrived": *Ryan*, at para. 55; *Southam*, at para. 56. Reasons that "simply repeat statutory language, summarize arguments made, and then state a peremptory conclusion" will rarely assist a reviewing court in understanding the rationale underlying a decision and "are no substitute for statements of fact, analysis, inference and judgment": R. A. Macdonald and D. Lametti, "Reasons for Decision in Administrative Law" (1990), 3 *C.J.A.L.P.* 123, at p. 139; see also *Gonzalez v. Canada (Minister of Citizenship and Immigration)*, 2014 FC 750, 27 Imm. L.R. (4th) 151, at paras. 57-59.

[103] While, as we indicated earlier (at paras. 89-96), formal reasons should be read in light of the record and with due sensitivity to the administrative regime in which they were given, a decision will be unreasonable if the reasons for it, read holistically, fail to reveal a rational chain of analysis or if they reveal that the decision was based on an irrational chain of analysis: see *Wright v. Nova Scotia (Human Rights Commission),* 2017 NSSC 11, 23 Admin. L.R. (6th) 110; *Southam*, at para. 56. A decision will also be unreasonable where the conclusion reached cannot follow from the analysis undertaken (see *Sangmo v. Canada (Minister of Citizenship and Immigration)*, 2016 FC 17, at para. 21 (CanLII)) or if the reasons read in conjunction with the record do not make it possible to understand the decision maker's reasoning on a critical point (see *Blas v. Canada (Minister of Citizenship and Immigration)*,

(1) Une décision raisonnable est fondée sur un raisonnement intrinsèquement cohérent

[102] Pour être raisonnable, une décision doit être fondée sur un raisonnement à la fois rationnel et logique. Il s'ensuit qu'un manquement à cet égard peut amener la cour de révision à conclure qu'il y a lieu d'infirmer la décision. Certes, le contrôle selon la norme de la décision raisonnable n'est pas « une chasse au trésor, phrase par phrase, à la recherche d'une erreur » : *Pâtes & Papier Irving*, par. 54, citant *Newfoundland Nurses*, par. 14. Cependant, la cour de révision doit être en mesure de suivre le raisonnement du décideur sans buter sur une faille décisive dans la logique globale; elle doit être convaincue qu'« [un] mode d'analyse, dans les motifs avancés, [. . .] pouvait raisonnablement amener le tribunal, au vu de la preuve, à conclure comme il l'a fait » : *Ryan*, par. 55; *Southam*, par. 56. Les motifs qui [TRADUCTION] « ne font que reprendre le libellé de la loi, résumer les arguments avancés et formuler ensuite une conclusion péremptoire » permettent rarement à la cour de révision de comprendre le raisonnement qui justifie une décision, et « ne sauraient tenir lieu d'exposé de faits, d'analyse, d'inférences ou de jugement » : R. A. Macdonald et D. Lametti, « Reasons for Decision in Administrative Law » (1990), 3 *R.C.D.A.P.* 123, p. 139; voir également *Gonzalez c. Canada (Ministre de la Citoyenneté et de l'Immigration)*, 2014 CF 750, par. 57-59 (CanLII).

[103] Bien que, comme nous l'avons déjà mentionné aux par. 89 à 96, il faille interpréter des motifs écrits eu égard au dossier et en tenant dûment compte du régime administratif dans lequel ils sont donnés, une décision sera déraisonnable lorsque, lus dans leur ensemble, les motifs ne font pas état d'une analyse rationnelle ou montrent que la décision est fondée sur une analyse irrationnelle : voir *Wright c. Nova Scotia (Human Rights Commission)*, 2017 NSSC 11, 23 Admin. L.R. (6th) 110; *Southam*, par. 56. Une décision sera également déraisonnable si la conclusion tirée ne peut prendre sa source dans l'analyse effectuée (voir *Sangmo c. Canada (Ministre de la Citoyenneté et de l'Immigration)*, 2016 CF 17, par. 21 (CanLII)), ou qu'il est impossible de comprendre, lorsqu'on lit les motifs en corrélation avec le dossier, le raisonnement du décideur sur un point central (voir

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2014 FC 629, 26 Imm. L.R. (4th) 92, at paras. 54-66; *Reid v. Criminal Injuries Compensation Board*, 2015 ONSC 6578; *Lloyd v. Canada (Attorney General)*, 2016 FCA 115, 2016 D.T.C. 5051; *Taman v. Canada (Attorney General)*, 2017 FCA 1, [2017] 3 F.C.R. 520, at para. 47).

[104] Similarly, the internal rationality of a decision may be called into question if the reasons exhibit clear logical fallacies, such as circular reasoning, false dilemmas, unfounded generalizations or an absurd premise. This is not an invitation to hold administrative decision makers to the formalistic constraints and standards of academic logicians. However, a reviewing court must ultimately be satisfied that the decision maker's reasoning "adds up".

(2) A Reasonable Decision Is Justified in Light of the Legal and Factual Constraints That Bear on the Decision

[105] In addition to the need for internally coherent reasoning, a decision, to be reasonable, must be justified in relation to the constellation of law and facts that are relevant to the decision: *Dunsmuir*, at para. 47; *Catalyst*, at para. 13; *Nor-Man Regional Health Authority*, at para. 6. Elements of the legal and factual contexts of a decision operate as constraints on the decision maker in the exercise of its delegated powers.

[106] It is unnecessary to catalogue all of the legal or factual considerations that could constrain an administrative decision maker in a particular case. However, in the sections that follow, we discuss a number of elements that will generally be relevant in evaluating whether a given decision is reasonable, namely: the governing statutory scheme; other relevant statutory or common law; the principles of statutory interpretation; the evidence before the decision maker and facts of which the decision maker may take notice; the submissions of the parties; the past practices and decisions of the administrative body; and the potential impact of the decision on the individual to whom it applies. These elements

Blas c. Canada (Ministre de la Citoyenneté et de l'Immigration), 2014 CF 629, par. 54-66 (CanLII); *Reid c. Criminal Injuries Compensation Board*, 2015 ONSC 6578; *Lloyd c. Canada (Procureur général)*, 2016 CAF 115; *Taman c. Canada (Procureur général)*, 2017 CAF 1, [2017] 3 R.C.F. 520, par. 47).

[104] De même, la logique interne d'une décision peut également être remise en question lorsque les motifs sont entachés d'erreurs manifestes sur le plan rationnel — comme lorsque le décideur a suivi un raisonnement tautologique ou a recouru à de faux dilemmes, à des généralisations non fondées ou à une prémisse absurde. Il ne s'agit pas d'inviter la cour de révision à assujettir les décideurs administratifs à des contraintes formalistes ou aux normes auxquelles sont astreints des logiciens érudits. Toutefois, la cour de révision doit être convaincue que le raisonnement du décideur « se tient ».

(2) Une décision raisonnable est justifiée au regard des contraintes juridiques et factuelles qui ont une incidence sur la décision

[105] En plus de la nécessité qu'elle soit fondée sur un raisonnement intrinsèquement cohérent, une décision raisonnable doit être justifiée au regard de l'ensemble du droit et des faits pertinents : *Dunsmuir*, par. 47; *Catalyst*, par. 13; *Nor-Man Regional Health Authority*, par. 6. Les éléments du contexte juridique et factuel d'une décision constituent des contraintes qui ont une influence sur le décideur dans l'exercice des pouvoirs qui lui sont délégués.

[106] Il est inutile de cataloguer toutes les considérations juridiques ou factuelles qui pourraient réduire la marge de manœuvre d'un décideur administratif dans un cas donné. Néanmoins, dans les sections qui suivent, nous nous penchons sur un certain nombre d'éléments qui sont généralement utiles pour déterminer si une décision est raisonnable. Il s'agit notamment du régime législatif applicable et de tout autre principe législatif ou principe de common law pertinent, des principes d'interprétation des lois, de la preuve portée à la connaissance du décideur et des faits dont le décideur peut prendre connaissance d'office, des observations des parties, des pratiques et décisions antérieures de l'organisme administratif

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are not a checklist for conducting reasonableness review, and they may vary in significance depending on the context. They are offered merely to highlight some elements of the surrounding context that can cause a reviewing court to lose confidence in the outcome reached.

[107] A reviewing court may find that a decision is unreasonable when examined against these contextual considerations. These elements necessarily interact with one another: for example, a reasonable penalty for professional misconduct in a given case must be justified *both* with respect to the types of penalties prescribed by the relevant legislation and with respect to the nature of the underlying misconduct.

(a) *Governing Statutory Scheme*

[108] Because administrative decision makers receive their powers by statute, the governing statutory scheme is likely to be the most salient aspect of the legal context relevant to a particular decision. That administrative decision makers play a role, along with courts, in elaborating the precise content of the administrative schemes they administer should not be taken to mean that administrative decision makers are permitted to disregard or rewrite the law as enacted by Parliament and the provincial legislatures. Thus, for example, while an administrative body may have considerable discretion in making a particular decision, that decision must ultimately comply "with the rationale and purview of the statutory scheme under which it is adopted": *Catalyst*, at paras. 15 and 25-28; see also *Green*, at para. 44. As Rand J. noted in *Roncarelli v. Duplessis*, [1959] S.C.R. 121, at p. 140, "there is no such thing as absolute and untrammelled 'discretion'", and any exercise of discretion must accord with the purposes for which it was given: see also *Congrégation des témoins de Jéhovah de St-Jérôme-Lafontaine*, at para. 7; *Montréal (City) v. Montreal Port Authority*, 2010 SCC 14, [2010] 1 S.C.R. 427, at paras. 32-33; *Nor-Man Regional Health Authority*, at para. 6. Likewise, a decision must comport with any more specific constraints imposed by the governing legislative scheme, such as

et, enfin, de l'impact potentiel de la décision sur l'individu qui en fait l'objet. Ces éléments ne doivent pas servir de liste de vérification pour l'exercice du contrôle selon la norme de la décision raisonnable et leur importance peut varier selon le contexte. L'objectif est simplement d'insister sur certains éléments du contexte pouvant amener la cour de révision à perdre confiance dans le résultat obtenu.

[107] Il est possible que la cour de révision estime qu'une décision est déraisonnable au regard de ces considérations contextuelles. Ces éléments interagissent forcément entre eux : par exemple, une sanction raisonnable infligée pour inconduite professionnelle dans un cas donné doit être justifiée *à la fois* au regard des sanctions prescrites par les dispositions législatives applicables et de la nature de l'inconduite en cause.

a) *Le régime législatif applicable*

[108] Comme les décideurs administratifs tiennent leurs pouvoirs d'une loi, le régime législatif applicable est probablement l'aspect le plus important du contexte juridique d'une décision donnée. Le fait que les décideurs administratifs participent, avec les cours de justice, à l'élaboration du contenu précis des régimes administratifs qu'ils administrent, ne devrait pas être interprété comme une licence accordée aux décideurs administratifs pour ignorer ou réécrire les lois adoptées par le Parlement et les législatures provinciales. Ainsi, bien qu'un organisme administratif puisse disposer d'un vaste pouvoir discrétionnaire lorsqu'il s'agit de prendre une décision en particulier, cette décision doit en fin de compte être conforme « à la raison d'être et à la portée du régime législatif sous lequel elle a été adoptée » : *Catalyst*, par. 15 et 25-28; voir aussi *Green*, par. 44. En effet, comme le faisait remarquer le juge Rand dans l'arrêt *Roncarelli c. Duplessis*, [1959] R.C.S. 121, p. 140, [TRADUCTION] « il n'y a rien de tel qu'une "discrétion" absolue et sans entraves », et tout exercice d'un pouvoir discrétionnaire doit être conforme aux fins pour lesquelles il a été accordé : voir aussi *Congrégation des témoins de Jéhovah de St-Jérôme-Lafontaine*, par. 7; *Montréal (Ville) c. Administration portuaire de Montréal*, 2010 CSC 14, [2010] 1 R.C.S. 427, par. 32-33; *Nor-Man Regional Health Authority*,

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the statutory definitions, principles or formulas that prescribe the exercise of a discretion: see *Montréal (City)*, at paras. 33 and 40-41; *Canada (Attorney General) v. Almon Equipment Limited*, 2010 FCA 193, [2011] 4 F.C.R. 203, at paras. 38-40. The statutory scheme also informs the acceptable approaches to decision making: for example, where a decision maker is given wide discretion, it would be unreasonable for it to fetter that discretion: see *Delta Air Lines*, at para. 18.

[109] As stated above, a proper application of the reasonableness standard is capable of allaying the concern that an administrative decision maker might interpret the scope of its own authority beyond what the legislature intended. As a result, there is no need to maintain a category of "truly" jurisdictional questions that are subject to correctness review. Although a decision maker's interpretation of its statutory grant of authority is generally entitled to deference, the decision maker must nonetheless properly justify that interpretation. Reasonableness review does not allow administrative decision makers to arrogate powers to themselves that they were never intended to have, and an administrative body cannot exercise authority which was not delegated to it. Contrary to our colleagues' concern (at para. 285), this does not reintroduce the concept of "jurisdictional error" into judicial review, but merely identifies one of the obvious and necessary constraints imposed on administrative decision makers.

[110] Whether an interpretation is justified will depend on the context, including the language chosen by the legislature in describing the limits and contours of the decision maker's authority. If a legislature wishes to precisely circumscribe an administrative decision maker's power in some respect, it can do so by using precise and narrow language and delineating the power in detail, thereby tightly

par. 6. De même, la décision doit tenir compte de toute contrainte plus spécifique clairement imposée par le régime législatif applicable, telle que les définitions, les formules ou les principes prévus par la loi qui prescrivent l'exercice d'un pouvoir discrétionnaire : voir *Montréal (Ville)*, par. 33 et 40-41; *Canada (Procureur général) c. Almon Equipment Limited*, 2010 CAF 193, [2011] 4 R.C.F. 203, par. 38-40. Le régime législatif oriente également les approches acceptables en matière de prise de décisions : par exemple, lorsque le décideur dispose d'un vaste pouvoir discrétionnaire, il serait déraisonnable de sa part d'entraver un tel pouvoir discrétionnaire : voir *Delta Air Lines*, par. 18.

[109] Comme nous l'avons déjà mentionné, l'application appropriée de la norme de la décision raisonnable permet de dissiper la crainte que le décideur administratif puisse interpréter la portée de sa propre compétence de manière à étendre ses pouvoirs au-delà de ce que voulait le législateur. Il est ainsi inutile de conserver une catégorie de questions touchant « véritablement » à la compétence assujetties au contrôle selon la norme de la décision correcte. Si, en règle générale, il y a lieu de faire preuve de déférence envers l'interprétation que donne le décideur du pouvoir que lui confère la loi, ce dernier doit néanmoins justifier convenablement son interprétation. Le contrôle selon la norme de la décision raisonnable ne permet pas au décideur administratif de s'arroger des pouvoirs que le législateur n'a jamais voulu lui conférer. De la même manière, un organisme administratif ne saurait exercer un pouvoir qui ne lui a pas été délégué. Contrairement aux préoccupations exprimées par nos collègues (par. 285), cette démarche ne fait pas resurgir la notion d'« erreur de compétence » dans le contrôle judiciaire; elle ne fait que relever l'une des contraintes évidentes et nécessaires qui s'imposent aux décideurs administratifs.

[110] La question de savoir si une interprétation est justifiée dépendra du contexte, notamment des mots choisis par le législateur pour décrire les limites et les contours du pouvoir du décideur. Si le législateur souhaite circonscrire avec précision le pouvoir d'un décideur administratif de façon ciblée, il peut se servir de termes précis et restrictifs et définir en détail les pouvoirs conférés, limitant ainsi strictement

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constraining the decision maker's ability to interpret the provision. Conversely, where the legislature chooses to use broad, open-ended or highly qualitative language — for example, "in the public interest" — it clearly contemplates that the decision maker is to have greater flexibility in interpreting the meaning of such language. Other language will fall in the middle of this spectrum. All of this is to say that certain questions relating to the scope of a decision maker's authority may support more than one interpretation, while other questions may support only one, depending upon the text by which the statutory grant of authority is made. What matters is whether, in the eyes of the reviewing court, the decision maker has properly justified its interpretation of the statute in light of the surrounding context. It will, of course, be impossible for an administrative decision maker to justify a decision that strays beyond the limits set by the statutory language it is interpreting.

(b) *Other Statutory or Common Law*

[111] It is evident that both statutory and common law will impose constraints on how and what an administrative decision maker can lawfully decide: see *Dunsmuir*, at paras. 47 and 74. For example, an administrative decision maker interpreting the scope of its regulation-making authority in order to exercise that authority cannot adopt an interpretation that is inconsistent with applicable common law principles regarding the nature of statutory powers: see *Katz Group Canada Inc. v. Ontario (Health and Long-Term Care)*, 2013 SCC 64, [2013] 3 S.C.R. 810, at paras. 45-48. Neither can a body instructed by legislation to determine what tax rate is applicable in accordance with an existing tax system ignore that system and base its determination on a "fictitious" system it has arbitrarily created: *Montréal (City)*, at para. 40. Where a relationship is governed by private law, it would be unreasonable for a decision maker to ignore that law in adjudicating parties' rights within that relationship: *Dunsmuir*, at para. 74. Similarly, where the governing statute specifies a standard that is well known in law and in the jurisprudence, a reasonable decision will generally be one that is consistent with the established understanding

les interprétations que le décideur peut donner de la disposition habilitante. À l'inverse, dans les cas où le législateur choisit d'utiliser des termes généraux, non limitatifs ou nettement qualitatifs — par exemple, l'expression « dans l'intérêt public » — il envisage manifestement que le décideur jouisse d'une souplesse accrue dans l'interprétation d'un tel libellé. D'autres formulations se retrouveront entre ces deux extrêmes. Bref, selon le libellé des dispositions législatives habilitantes, certaines questions touchant à la portée du pouvoir d'un décideur peuvent se prêter à plusieurs interprétations, alors que d'autres questions ne sauraient commander qu'une seule interprétation. Ce qui importe, c'est de déterminer si, aux yeux de la cour de révision, le décideur a justifié convenablement son interprétation de la loi à la lumière du contexte. Évidemment, il sera impossible au décideur administratif de justifier une décision qui excède les limites fixées par les dispositions législatives qu'il interprète.

b) *Les autres règles législatives ou de common law*

[111] Il coule de source que le droit — tant la loi que la common law — limitera l'éventail des options qui s'offrent légalement au décideur administratif chargé de trancher un cas particulier : voir *Dunsmuir*, par. 47 et 74. Par exemple, le décideur administratif qui interprète la portée de son pouvoir de réglementation dans le but de l'exercer ne peut retenir une interprétation incompatible avec les principes de common law applicables en ce qui concerne la nature des pouvoirs législatifs : voir *Katz Group Canada Inc. c. Ontario (Santé et Soins de longue durée)*, 2013 CSC 64, [2013] 3 R.C.S. 810, par. 45-48. Un organisme chargé par la loi d'évaluer un taux d'imposition applicable conformément à un régime fiscal existant en particulier ne peut non plus faire fi de ce régime ni baser ses calculs sur un système « fictif » qu'il a créé arbitrairement : *Montréal (Ville)*, par. 40. Lorsqu'une relation est régie par le droit privé, il serait déraisonnable de la part du décideur de faire abstraction de ce fait lorsqu'il se prononce sur les droits des parties dans le cadre de cette relation : *Dunsmuir*, par. 74. De la même manière, lorsque la loi habilitante prévoit l'application d'une norme bien connue en droit et dans la jurisprudence, une décision

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of that standard: see, e.g., the discussion of "reasonable grounds to suspect" in *Canada (Transport, Infrastructure and Communities) v. Farwaha*, 2014 FCA 56, [2015] 2 F.C.R. 1006, at paras. 93-98.

[112] Any precedents on the issue before the administrative decision maker or on a similar issue will act as a constraint on what the decision maker can reasonably decide. An administrative body's decision may be unreasonable on the basis that the body failed to explain or justify a departure from a binding precedent in which the same provision had been interpreted. Where, for example, there is a relevant case in which a court considered a statutory provision, it would be unreasonable for an administrative decision maker to interpret or apply the provision without regard to that precedent. The decision maker would have to be able to explain why a different interpretation is preferable by, for example, explaining why the court's interpretation does not work in the administrative context: M. Biddulph, "Rethinking the Ramifications of Reasonableness Review: *Stare Decisis* and Reasonableness Review on Questions of Law" (2018), 56 *Alta. L.R.* 119, at p. 146. There may be circumstances in which it is quite simply unreasonable for an administrative decision maker to fail to apply or interpret a statutory provision in accordance with a binding precedent. For instance, where an immigration tribunal is required to determine whether an applicant's act would constitute a criminal offence under Canadian law (see, e.g., *Immigration and Refugee Protection Act*, S.C. 2001, c. 27, ss. 35 to 37), it would clearly not be reasonable for the tribunal to adopt an interpretation of a criminal law provision that is inconsistent with how Canadian criminal courts have interpreted it.

[113] That being said, administrative decision makers will not necessarily be required to apply equitable and common law principles in the same manner as courts in order for their decisions to be reasonable. For example, it may be reasonable for a decision maker to adapt a common law or equitable doctrine to its administrative context: see *Nor-Man Regional*

raisonnable sera généralement conforme à l'acception consacrée de cette norme : voir, p. ex., l'analyse des « motifs raisonnables de soupçonner » dans l'arrêt *Canada (Transports, Infrastructure et Collectivités) c. Farwaha*, 2014 CAF 56, [2015] 2 R.C.F. 1006, par. 93-98.

[112] Tout précédent sur la question soumise au décideur administratif ou sur une question semblable aura pour effet de circonscrire l'éventail des issues raisonnables. La décision d'un organisme administratif peut être déraisonnable en raison de l'omission d'expliquer ou de justifier une dérogation à un précédent contraignant dans lequel a été interprétée la même disposition. Si, par exemple, une cour de justice a examiné une disposition législative dans un jugement pertinent, il serait déraisonnable que le décideur administratif interprète ou applique celle-ci sans égard à ce précédent. Le décideur devrait être en mesure d'indiquer pourquoi il est préférable d'adopter une autre interprétation, par exemple en expliquant pourquoi l'interprétation de la cour de justice ne fonctionne pas dans le contexte administratif : M. Biddulph, « Rethinking the Ramifications of Reasonableness Review : *Stare Decisis* and Reasonableness Review on Questions of Law » (2018), 56 *Alta. L.R.* 119, p. 146. Il peut y avoir des circonstances dans lesquelles il est tout simplement déraisonnable que le décideur administratif n'applique ou n'interprète pas une disposition législative en conformité avec un précédent contraignant. Par exemple, dans les cas où une cour de justice compétente en matière d'immigration est appelée à décider si un acte constitue une infraction criminelle en droit canadien (voir, p. ex., la *Loi sur l'immigration et la protection des réfugiés*, L.C. 2001, c. 27, art. 35 à 37), il serait à l'évidence déraisonnable que le tribunal retienne une interprétation d'une disposition pénale qui soit incompatible avec l'interprétation que lui ont donnée les cours criminelles canadiennes.

[113] Cela dit, les décideurs administratifs ne seront pas nécessairement tenus d'appliquer les principes d'equity et de common law de la même façon qu'une cour de justice pour que leurs décisions soient raisonnables. Par exemple, il serait raisonnable pour le décideur d'adapter une doctrine de common law ou d'equity au contexte administratif qui lui est propre :

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Health Authority, at paras. 5-6, 44-45, 52, 54 and 60. Conversely, a decision maker that rigidly applies a common law doctrine without adapting it to the relevant administrative context may be acting unreasonably: see *Delta Air Lines*, at paras. 16-17 and 30. In short, whether an administrative decision maker has acted reasonably in adapting a legal or equitable doctrine involves a highly context-specific determination.

[114] We would also note that in some administrative decision making contexts, international law will operate as an important constraint on an administrative decision maker. It is well established that legislation is presumed to operate in conformity with Canada's international obligations, and the legislature is "presumed to comply with the values and principles of customary and conventional international law": *R. v. Hape*, 2007 SCC 26, [2007] 2 S.C.R. 292, at para. 53; *R. v. Appulonappa*, 2015 SCC 59, [2015] 3 S.C.R. 754, at para. 40. Since *Baker*, it has also been clear that international treaties and conventions, even where they have not been implemented domestically by statute, can help to inform whether a decision was a reasonable exercise of administrative power: *Baker*, at paras. 69-71
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(c) *Principles of Statutory Interpretation*

[115] Matters of statutory interpretation are not treated uniquely and, as with other questions of law, may be evaluated on a reasonableness standard. Although the general approach to reasonableness review described above applies in such cases, we recognize that it is necessary to provide additional guidance to reviewing courts on this point. This is because reviewing courts are accustomed to resolving questions of statutory interpretation in a context in which the issue is before them at first instance or on appeal, and where they are expected to perform their own independent analysis and come to their own conclusions.

[116] Reasonableness review functions differently. Where reasonableness is the applicable standard on

voir *Nor-Man Regional Health Authority*, par. 5-6, 44-45, 52, 54 et 60. En revanche, le décideur qui applique de manière rigide une doctrine de common law sans l'adapter au contexte administratif pertinent agit peut-être de manière déraisonnable : voir *Delta Air Lines*, par. 16-17 et 30. Bref, la question de savoir si le décideur administratif a agi raisonnablement en adaptant une règle de droit ou d'equity appelle un examen fondé dans une très large mesure sur le contexte.

[114] Nous tenons également à faire remarquer que le droit international représentera une contrainte importante pour un décideur administratif dans certains domaines du processus décisionnel administratif. Il est bien établi que la législation est réputée s'appliquer conformément aux obligations internationales du Canada et que l'organe législatif est « présumé respecter les valeurs et les principes du droit international coutumier et conventionnel » : *R. c. Hape*, 2007 CSC 26, [2007] 2 R.C.S. 292, par. 53; *R. c. Appulonappa*, 2015 CSC 59, [2015] 3 R.C.S. 754, par. 40. Depuis l'arrêt *Baker*, il est également établi que les conventions et les traités internationaux, même s'ils n'ont pas été mis en œuvre par une loi au Canada, s'avèrent utiles pour déterminer si une décision participe d'un exercice raisonnable du pouvoir administratif : *Baker*, par. 69-71.

c) *Les principes d'interprétation législative*

[115] Les questions d'interprétation de la loi ne reçoivent pas un traitement exceptionnel. Comme toute autre question de droit, on peut les évaluer en appliquant la norme de la décision raisonnable. Bien que la méthode générale de contrôle selon la norme de la décision raisonnable exposée précédemment s'applique dans ces cas, nous sommes conscients de la nécessité de fournir des indications supplémentaires aux cours de révision sur ce point. En effet, les cours de révision ont l'habitude de trancher les questions d'interprétation législative en première instance ou en appel, où elles doivent effectuer leurs propres analyses indépendantes et tirer leurs propres conclusions.

[116] Le contrôle selon la norme de la décision raisonnable s'effectue différemment. Si une question

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a question of statutory interpretation, the reviewing court does not undertake a *de novo* analysis of the question or "ask itself what the correct decision would have been": *Ryan*, at para. 50. Instead, just as it does when applying the reasonableness standard in reviewing questions of fact, discretion or policy, the court must examine the administrative decision as a whole, including the reasons provided by the decision maker and the outcome that was reached.

[117] A court interpreting a statutory provision does so by applying the "modern principle" of statutory interpretation, that is, that the words of a statute must be read "in their entire context and in their grammatical and ordinary sense harmoniously with the scheme of the Act, the object of the Act, and the intention of Parliament": *Rizzo & Rizzo Shoes Ltd. (Re)*, [1998] 1 S.C.R. 27, at para. 21, and *Bell ExpressVu Limited Partnership v. Rex*, 2002 SCC 42, [2002] 2 S.C.R. 559, at para. 26, both quoting E. Driedger, *Construction of Statutes* (2nd ed. 1983), at p. 87. Parliament and the provincial legislatures have also provided guidance by way of statutory rules that explicitly govern the interpretation of statutes and regulations: see, e.g., *Interpretation Act*, R.S.C. 1985, c. I-21.

[118] This Court has adopted the "modern principle" as the proper approach to statutory interpretation, because legislative intent can be understood only by reading the language chosen by the legislature in light of the purpose of the provision and the entire relevant context: Sullivan, at pp. 7-8. Those who draft and enact statutes expect that questions about their meaning will be resolved by an analysis that has regard to the text, context and purpose, regardless of whether the entity tasked with interpreting the law is a court or an administrative decision maker. An approach to reasonableness review that respects legislative intent must therefore assume that those who interpret the law — whether courts or administrative decision makers — will do so in a manner consistent with this principle of interpretation.

d'interprétation législative fait l'objet d'un contrôle selon la norme de la décision raisonnable, la cour de révision ne procède pas à une analyse *de novo* de la question soulevée ni ne se demande « ce qu'aurait été la décision correcte » : *Ryan*, par. 50. Tout comme lorsqu'elle applique la norme de la décision raisonnable dans l'examen de questions de fait ou de questions concernant un pouvoir discrétionnaire ou des politiques, la cour de justice doit plutôt examiner la décision administrative dans son ensemble, y compris les motifs fournis par le décideur et le résultat obtenu.

[117] La cour qui interprète une disposition législative le fait en appliquant le « principe moderne » en matière d'interprétation des lois, selon lequel il faut lire les termes d'une loi « dans leur contexte global en suivant le sens ordinaire et grammatical qui s'harmonise avec l'économie de la loi, l'objet de la loi et l'intention du législateur » : *Rizzo & Rizzo Shoes Ltd. (Re)*, [1998] 1 R.C.S. 27, par. 21, et *Bell ExpressVu Limited Partnership c. Rex*, 2002 CSC 42, [2002] 2 R.C.S. 559, par. 26, citant tous deux E. Driedger, *Construction of Statutes* (2e éd. 1983), p. 87. Le Parlement et les législatures provinciales ont également donné certaines indications en adoptant des règles législatives qui encadrent explicitement l'interprétation des lois et des règlements : voir, p. ex., la *Loi d'interprétation*, L.R.C. 1985, c. I-21.

[118] Notre Cour a adopté ce « principe moderne » en tant que méthode appropriée d'interprétation des lois parce que c'est uniquement à partir du texte de loi, de l'objet de la disposition législative et du contexte dans son ensemble qu'il est possible de saisir l'intention du législateur : Sullivan, p. 7-8. Les personnes qui rédigent et adoptent des textes de loi s'attendent à ce que les questions concernant leur sens soient tranchées à la suite d'une analyse qui tienne compte du libellé, du contexte et de l'objet de la disposition concernée, que l'entité chargée d'interpréter la loi soit une cour de justice ou un décideur administratif. Une méthode de contrôle selon la norme de la décision raisonnable qui respecte l'intention du législateur doit donc tenir pour acquis que les instances chargées d'interpréter la loi — qu'il s'agisse des cours de justice ou des décideurs administratifs — effectueront cet exercice conformément au principe d'interprétation susmentionné.

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[119] Administrative decision makers are not required to engage in a formalistic statutory interpretation exercise in every case. As discussed above, formal reasons for a decision will not always be necessary and may, where required, take different forms. And even where the interpretive exercise conducted by the administrative decision maker is set out in written reasons, it may look quite different from that of a court. The specialized expertise and experience of administrative decision makers may sometimes lead them to rely, in interpreting a provision, on considerations that a court would not have thought to employ but that actually enrich and elevate the interpretive exercise.

[120] But whatever form the interpretive exercise takes, the merits of an administrative decision maker's interpretation of a statutory provision must be consistent with the text, context and purpose of the provision. In this sense, the usual principles of statutory interpretation apply equally when an administrative decision maker interprets a provision. Where, for example, the words used are "precise and unequivocal", their ordinary meaning will usually play a more significant role in the interpretive exercise: *Canada Trustco Mortgage Co. v. Canada*, 2005 SCC 54, [2005] 2 S.C.R. 601, at para. 10. Where the meaning of a statutory provision is disputed in administrative proceedings, the decision maker must demonstrate in its reasons that it was alive to these essential elements.

[121] The administrative decision maker's task is to interpret the contested provision in a manner consistent with the text, context and purpose, applying its particular insight into the statutory scheme at issue. It cannot adopt an interpretation it knows to be inferior — albeit plausible — merely because the interpretation in question appears to be available and is expedient. The decision maker's responsibility is to discern meaning and legislative intent, not to "reverse-engineer" a desired outcome.

[119] Les décideurs administratifs ne sont pas tenus dans tous les cas de procéder à une interprétation formaliste de la loi. Comme nous l'avons déjà expliqué, il n'est pas toujours nécessaire de motiver formellement une décision. Dans les cas où il faut en fournir, les motifs peuvent revêtir diverses formes. Et même lorsque l'interprétation à laquelle se livre le décideur administratif est exposée dans des motifs écrits, elle pourrait sembler bien différente de celle effectuée par la cour de justice. L'expertise spécialisée et l'expérience des décideurs administratifs peuvent parfois les amener à s'en remettre, pour interpréter une disposition, à des considérations qu'une cour de justice n'aurait pas songé à évoquer, mais qui enrichissent et rehaussent bel et bien l'interprétation.

[120] Or, quelle que soit la forme que prend l'opération d'interprétation d'une disposition législative, le fond de l'interprétation de celle-ci par le décideur administratif doit être conforme à son texte, à son contexte et à son objet. En ce sens, les principes habituels d'interprétation législative s'appliquent tout autant lorsqu'un décideur administratif interprète une disposition. Par exemple, lorsque le libellé d'une disposition est « précis et non équivoque », son sens ordinaire joue normalement un rôle plus important dans le processus d'interprétation : *Hypothèques Trustco Canada c. Canada*, 2005 CSC 54, [2005] 2 R.C.S. 601, par. 10. Lorsque le sens d'une disposition législative est contesté au cours d'une instance administrative, il incombe au décideur de démontrer dans ses motifs qu'il était conscient de ces éléments essentiels.

[121] La tâche du décideur administratif est d'interpréter la disposition contestée d'une manière qui cadre avec le texte, le contexte et l'objet, compte tenu de sa compréhension particulière du régime législatif en cause. Toutefois, le décideur administratif ne peut adopter une interprétation qu'il sait de moindre qualité — mais plausible — simplement parce que cette interprétation paraît possible et opportune. Il incombe au décideur de véritablement s'efforcer de discerner le sens de la disposition et l'intention du législateur, et non d'échafauder une interprétation à partir du résultat souhaité.

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[122] It can happen that an administrative decision maker, in interpreting a statutory provision, fails entirely to consider a pertinent aspect of its text, context or purpose. Where such an omission is a minor aspect of the interpretive context, it is not likely to undermine the decision as a whole. It is well established that decision makers are not required "to explicitly address all possible shades of meaning" of a given provision: *Construction Labour Relations v. Driver Iron Inc.*, 2012 SCC 65, [2012] 3 S.C.R. 405, at para. 3. Just like judges, administrative decision makers may find it unnecessary to dwell on each and every signal of statutory intent in their reasons. In many cases, it may be necessary to touch upon only the most salient aspects of the text, context or purpose. If, however, it is clear that the administrative decision maker may well, had it considered a key element of a statutory provision's text, context or purpose, have arrived at a different result, its failure to consider that element would be indefensible, and unreasonable in the circumstances. Like other aspects of reasonableness review, omissions are not stand-alone grounds for judicial intervention: the key question is whether the omitted aspect of the analysis causes the reviewing court to lose confidence in the outcome reached by the decision maker.

[123] There may be other cases in which the administrative decision maker has not explicitly considered the meaning of a relevant provision in its reasons, but the reviewing court is able to discern the interpretation adopted by the decision maker from the record and determine whether that interpretation is reasonable.

[124] Finally, even though the task of a court conducting a reasonableness review is *not* to perform a *de novo* analysis or to determine the "correct" interpretation of a disputed provision, it may sometimes become clear in the course of reviewing a decision that the interplay of text, context and purpose leaves room for a single reasonable interpretation of the statutory provision, or aspect of the statutory provision,

[122] Il se peut qu'au moment d'interpréter une disposition législative, le décideur administratif ne tienne aucunement compte d'un aspect pertinent de son texte, de son contexte ou de son objet. Lorsqu'il s'agit d'un aspect mineur du contexte interprétatif, cette omission n'est pas susceptible de compromettre la décision dans son ensemble. Il est bien établi que les décideurs ne sont pas tenus « de traiter expressément de toutes les interprétations possibles » d'une disposition donnée : *Construction Labour Relations c. Driver Iron Inc.*, 2012 CSC 65, [2012] 3 R.C.S. 405, par. 3. À l'instar des juges, les décideurs administratifs peuvent estimer qu'il n'est pas nécessaire de s'attarder, dans leurs motifs, au moindre signal d'une intention législative. Dans bien des cas, il peut se révéler nécessaire de ne prendre en compte que les aspects principaux du texte, du contexte ou de l'objet. Toutefois, s'il est manifeste que le décideur administratif aurait pu fort bien arriver à un résultat différent s'il avait pris en compte un élément clé du texte, du contexte ou de l'objet d'une disposition législative, le défaut de tenir compte de cet élément pourrait alors être indéfendable et déraisonnable dans les circonstances. Comme d'autres aspects du contrôle selon la norme de la décision raisonnable, les omissions ne justifient pas à elles seules l'intervention judiciaire : il s'agit principalement de savoir si l'aspect omis de l'analyse amène la cour de révision à perdre confiance dans le résultat auquel est arrivé le décideur.

[123] Par ailleurs, il se peut que le décideur administratif n'examine pas expressément dans ses motifs le sens d'une disposition pertinente, mais que la cour de révision soit en mesure de discerner l'interprétation adoptée à la lumière du dossier et de se prononcer sur le caractère raisonnable de cette interprétation.

[124] Enfin, même si la cour qui effectue un contrôle selon la norme de la décision raisonnable *ne* doit *pas* procéder à une analyse *de novo* ni déterminer l'interprétation « correcte » d'une disposition contestée, il devient parfois évident, lors du contrôle de la décision, que l'interaction du texte, du contexte et de l'objet ouvrent la porte à une seule interprétation raisonnable de la disposition législative en

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that is at issue: *Dunsmuir*, at paras. 72-76. One case in which this conclusion was reached was *Nova Tube Inc./Nova Steel Inc. v. Conares Metal Supply Ltd.*, 2019 FCA 52, in which Laskin J.A., after analyzing the reasoning of the administrative decision maker (at paras. 26-61 (CanLII)), held that the decision maker's interpretation had been unreasonable, and, furthermore, that the factors he had considered in his analysis weighed so overwhelmingly in favour of the opposite interpretation that that was the only reasonable interpretation of the provision: para. 61. As discussed below, it would serve no useful purpose in such a case to remit the interpretative question to the original decision maker. Even so, a court should generally pause before definitively pronouncing upon the interpretation of a provision entrusted to an administrative decision maker.

(d) *Evidence Before the Decision Maker*

[125] It is trite law that the decision maker may assess and evaluate the evidence before it and that, absent exceptional circumstances, a reviewing court will not interfere with its factual findings. The reviewing court must refrain from "reweighing and reassessing the evidence considered by the decision maker": *CHRC*, at para. 55; see also *Khosa*, at para. 64; *Dr. Q*, at paras. 41-42. Indeed, many of the same reasons that support an appellate court's deferring to a lower court's factual findings, including the need for judicial efficiency, the importance of preserving certainty and public confidence, and the relatively advantageous position of the first instance decision maker, apply equally in the context of judicial review: see *Housen*, at paras. 15-18; *Dr. Q*, at para. 38; *Dunsmuir*, at para. 53.

[126] That being said, a reasonable decision is one that is justified in light of the facts: *Dunsmuir*, at para. 47. The decision maker must take the evidentiary record and the general factual matrix that bears on its decision into account, and its decision must be reasonable in light of them: see *Southam*, at para. 56. The reasonableness of a decision may be jeopardized where the decision maker has fundamentally

cause ou de l'aspect contesté de celle-ci : *Dunsmuir*, par. 72-76. Cette conclusion a été tirée notamment dans l'arrêt *Nova Tube Inc./Nova Steel Inc. c. Conares Metal Supply Ltd.*, 2019 CAF 52, où, après avoir analysé le raisonnement du décideur administratif (par. 26-61 (CanLII)), le juge Laskin a statué que l'interprétation de ce décideur était déraisonnable et, en outre, que les facteurs dont il a tenu compte militaient si fortement en faveur de l'interprétation contraire qu'elle constituait la seule interprétation raisonnable de la disposition en cause : par. 61. Comme nous l'expliquerons plus loin, il ne servirait à rien de renvoyer la question de l'interprétation au décideur initial en pareil cas. Par contre, les cours de justice devraient généralement hésiter à se prononcer de manière définitive sur l'interprétation d'une disposition qui relève de la compétence d'un décideur administratif.

d) *La preuve dont disposait le décideur*

[125] Il est acquis que le décideur administratif peut apprécier et évaluer la preuve qui lui est soumise et qu'à moins de circonstances exceptionnelles, les cours de révision ne modifient pas ses conclusions de fait. Les cours de révision doivent également s'abstenir « d'apprécier à nouveau la preuve prise en compte par le décideur » : *CCDP*, par. 55; voir également *Khosa*, par. 64; *Dr Q*, par. 41-42. D'ailleurs, bon nombre des mêmes raisons qui justifient la déférence d'une cour d'appel à l'égard des conclusions de fait tirées par une juridiction inférieure, dont la nécessité d'assurer l'efficacité judiciaire, l'importance de préserver la certitude et la confiance du public et la position avantageuse qu'occupe le décideur de première instance, s'appliquent également dans le contexte du contrôle judiciaire : voir *Housen*, par. 15-18; *Dr Q*, par. 38; *Dunsmuir*, par. 53.

[126] Cela dit, une décision raisonnable en est une qui se justifie au regard des faits : *Dunsmuir*, par. 47. Le décideur doit prendre en considération la preuve versée au dossier et la trame factuelle générale qui a une incidence sur sa décision et celle-ci doit être raisonnable au regard de ces éléments : voir *Southam*, par. 56. Le caractère raisonnable d'une décision peut être compromis si le décideur

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misapprehended or failed to account for the evidence before it. In *Baker*, for example, the decision maker had relied on irrelevant stereotypes and failed to consider relevant evidence, which led to a conclusion that there was a reasonable apprehension of bias: para. 48. Moreover, the decision maker's approach would *also* have supported a finding that the decision was unreasonable on the basis that the decision maker showed that his conclusions were not based on the evidence that was actually before him: *ibid*.

(e) *Submissions of the Parties*

[127] The principles of justification and transparency require that an administrative decision maker's reasons meaningfully account for the central issues and concerns raised by the parties. The principle that the individual or individuals affected by a decision should have the opportunity to present their case fully and fairly underlies the duty of procedural fairness and is rooted in the right to be heard: *Baker*, at para. 28. The concept of responsive reasons is inherently bound up with this principle, because reasons are the primary mechanism by which decision makers demonstrate that they have actually *listened* to the parties.

[128] Reviewing courts cannot expect administrative decision makers to "respond to every argument or line of possible analysis" (*Newfoundland Nurses*, at para. 25), or to "make an explicit finding on each constituent element, however subordinate, leading to its final conclusion" (para. 16). To impose such expectations would have a paralyzing effect on the proper functioning of administrative bodies and would needlessly compromise important values such as efficiency and access to justice. However, a decision maker's failure to meaningfully grapple with key issues or central arguments raised by the parties may call into question whether the decision maker was actually alert and sensitive to the matter before it. In addition to assuring parties that their concerns have been heard, the process of drafting reasons with care and attention can alert the decision maker

s'est fondamentalement mépris sur la preuve qui lui a été soumise ou n'en a pas tenu compte. Dans l'arrêt *Baker*, par exemple, le décideur s'était fondé sur des stéréotypes dénués de pertinence et n'avait pas pris en compte une preuve pertinente, ce qui a mené à la conclusion qu'il existait une crainte raisonnable de partialité : par. 48. En outre, la démarche adoptée par le décideur permettait *également* de conclure au caractère déraisonnable de sa décision, car il avait démontré que ses conclusions ne reposaient pas sur la preuve dont il disposait en réalité : *ibid*.

e) *Les observations des parties*

[127] Les principes de la justification et de la transparence exigent que les motifs du décideur administratif tiennent valablement compte des questions et préoccupations centrales soulevées par les parties. Le principe suivant lequel la ou les personnes visées par une décision doivent avoir la possibilité de présenter entièrement et équitablement leur position est à la base de l'obligation d'équité procédurale et trouve son origine dans le droit d'être entendu : *Baker*, par. 28. La notion de « motifs adaptés aux questions et préoccupations soulevées » est inextricablement liée à ce principe étant donné que les motifs sont le principal mécanisme par lequel le décideur démontre qu'il a effectivement *écouté* les parties.

[128] Les cours de révision ne peuvent s'attendre à ce que les décideurs administratifs « répondent à tous les arguments ou modes possibles d'analyse » (*Newfoundland Nurses*, par. 25) ou « tire[nt] une conclusion explicite sur chaque élément constitutif du raisonnement, si subordonné soit-il, qui a mené à [leur] conclusion finale » (par. 16). Une telle exigence aurait un effet paralysant sur le bon fonctionnement des organismes administratifs et compromettrait inutilement des valeurs importantes telles que l'efficacité et l'accès à la justice. Toutefois, le fait qu'un décideur n'ait pas réussi à s'attaquer de façon significative aux questions clés ou aux arguments principaux formulés par les parties permet de se demander s'il était effectivement attentif et sensible à la question qui lui était soumise. En plus d'assurer aux parties que leurs préoccupations

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to inadvertent gaps and other flaws in its reasoning: *Baker*, at para. 39.

(f) *Past Practices and Past Decisions*

[129] Administrative decision makers are not bound by their previous decisions in the same sense that courts are bound by *stare decisis*. As this Court noted in *Domtar*, "a lack of unanimity is the price to pay for the decision-making freedom and independence" given to administrative decision makers, and the mere fact that some conflict exists among an administrative body's decisions does not threaten the rule of law: p. 800. Nevertheless, administrative decision makers and reviewing courts alike must be concerned with the general consistency of administrative decisions. Those affected by administrative decisions are entitled to expect that like cases will generally be treated alike and that outcomes will not depend merely on the identity of the individual decision maker — expectations that do not evaporate simply because the parties are not before a judge.

[130] Fortunately, administrative bodies generally have a range of resources at their disposal to address these types of concerns. Access to past reasons and summaries of past reasons enables multiple individual decision makers within a single organization (such as administrative tribunal members) to learn from each other's work, and contributes to a harmonized decision-making culture. Institutions also routinely rely on standards, policy directives and internal legal opinions to encourage greater uniformity and guide the work of frontline decision makers. This Court has also held that plenary meetings of a tribunal's members can be an effective tool to "foster coherence" and "avoid . . . conflicting results": *IWA v. Consolidated-Bathurst Packaging Ltd.*, [1990] 1 S.C.R. 282, at pp. 324-28. Where disagreement arises within an administrative body about how to appropriately resolve a given issue, that institution may also develop strategies

ont été prises en considération, le simple fait de rédiger des motifs avec soin et attention permet au décideur d'éviter que son raisonnement soit entaché de lacunes et d'autres failles involontaires : *Baker*, par. 39.

f) *Les pratiques et décisions antérieures*

[129] Les décideurs administratifs ne sont pas liés par leurs décisions antérieures au même titre que le sont les cours de justice suivant la règle du *stare decisis*. Comme l'a fait remarquer la Cour dans l'arrêt *Domtar*, « l'absence d'unanimité est [. . .] le prix à payer pour la liberté et l'indépendance décisionnelle » accordées aux décideurs administratifs, et la simple existence d'un certain conflit dans la jurisprudence d'un organisme administratif ne menace pas la primauté du droit : p. 800. Les décideurs administratifs et les cours de révision doivent toutefois se soucier de l'uniformité générale des décisions administratives. Les personnes visées par les décisions administratives sont en droit de s'attendre à ce que les affaires semblables soient généralement tranchées de la même façon et que les résultats ne dépendent pas seulement de l'identité du décideur — des attentes qui ne s'évaporent pas du simple fait que les parties ne comparaissent pas devant un juge.

[130] Heureusement, les organismes administratifs disposent généralement d'un éventail de ressources pour répondre à ce genre de préoccupations. La consultation des motifs antérieurs et de leurs résumés permet aux multiples décideurs au sein d'une même organisation (tels les membres d'un tribunal administratif) d'apprendre les uns des autres et de contribuer à l'édification d'une culture décisionnelle harmonisée. Les institutions se fient elles aussi régulièrement à des normes, à des directives stratégiques, ainsi qu'à des avis juridiques internes pour favoriser une plus grande uniformité et pour orienter le travail des décideurs de première ligne. La Cour a également conclu que les réunions plénières des membres d'un tribunal peuvent constituer un moyen efficace de « favoriser la cohérence » et d'« éviter [les] solutions incompatibles » : *SITBA c. Consolidated-Bathurst Packaging Ltd.*, [1990] 1 R.C.S. 282, p. 324-328. Lorsque des désaccords

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to address that divergence internally and on its own initiative. Of course, consistency can also be encouraged through less formal methods, such as the development of training materials, checklists and templates for the purpose of streamlining and strengthening institutional best practices, provided that these methods do not operate to fetter decision making.

[131] Whether a particular decision is consistent with the administrative body's past decisions is also a constraint that the reviewing court should consider when determining whether an administrative decision is reasonable. Where a decision maker *does* depart from longstanding practices or established internal authority, it bears the justificatory burden of explaining that departure in its reasons. If the decision maker does not satisfy this burden, the decision will be unreasonable. In this sense, the legitimate expectations of the parties help to determine both whether reasons are required and what those reasons must explain: *Baker*, at para. 26. We repeat that this does not mean administrative decision makers are bound by internal precedent in the same manner as courts. Rather, it means that a decision that departs from longstanding practices or established internal decisions will be reasonable if that departure is justified, thereby reducing the risk of arbitrariness, which would undermine public confidence in administrative decision makers and in the justice system as a whole.

[132] As discussed above, it has been argued that correctness review would be required where there is "persistent discord" on questions on law in an administrative body's decisions. While we are not of the view that such a correctness category is required, we would note that reviewing courts have a role to play in managing the risk of persistently discordant or contradictory legal interpretations within an administrative body's decisions. When evidence of internal disagreement on legal issues has been put before a reviewing court, the court may find it appropriate to

surviennent au sein d'un organisme administratif sur la façon de trancher convenablement une question donnée, cette institution peut également prendre l'initiative de mettre au point des stratégies pour régler ses divergences à l'interne. Évidemment, l'uniformité peut être aussi encouragée par l'utilisation de méthodes moins formelles comme des outils de formation, des listes de vérification et des modèles, lesquels peuvent être élaborés afin de simplifier et de renforcer les pratiques exemplaires au sein de l'institution — pourvu que ces méthodes n'entravent pas le processus décisionnel.

[131] La question de savoir si une décision en particulier est conforme à la jurisprudence de l'organisme administratif est elle aussi une contrainte dont devrait tenir compte la cour de révision au moment de décider si cette décision est raisonnable. Lorsqu'un décideur *s'écarte* d'une pratique de longue date ou d'une jurisprudence interne constante, c'est sur ses épaules que repose le fardeau d'expliquer cet écart dans ses motifs. Si le décideur ne s'acquitte pas de ce fardeau, la décision est déraisonnable. En ce sens, les attentes légitimes des parties servent à déterminer à la fois la nécessité de motiver la décision et le contenu des motifs : *Baker*, par. 26. Nous le répétons, il ne s'ensuit pas pour autant que les décideurs administratifs sont liés par les décisions antérieures au même titre que les cours de justice. Cela veut plutôt dire qu'une décision dérogeant à une pratique de longue date ou à une jurisprudence interne établie sera raisonnable si cette dérogation est justifiée, ce qui réduit le risque d'arbitraire, lequel a un effet préjudiciable sur la confiance du public envers les décideurs administratifs et le système de justice dans son ensemble.

[132] Comme nous l'avons expliqué, certains ont soutenu qu'un contrôle selon la norme de la décision correcte s'imposerait dans les cas où des questions de droit « sèment constamment la discorde » dans les décisions d'un organisme administratif. Nous estimons que point n'est besoin d'une telle catégorie de questions où la norme de la décision correcte s'applique; nous devons toutefois souligner que les cours de révision ont un rôle à jouer lorsqu'il s'agit de réduire le risque d'interprétations juridiques constamment discordantes ou contradictoires dans les décisions

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telegraph the existence of an issue in its reasons and encourage the use of internal administrative structures to resolve the disagreement. And if internal disagreement continues, it may become increasingly difficult for the administrative body to justify decisions that serve only to preserve the discord.

(g) *Impact of the Decision on the Affected Individual*

[133] It is well established that individuals are entitled to greater procedural protection when the decision in question involves the potential for significant personal impact or harm: *Baker*, at para. 25. However, this principle also has implications for how a court conducts reasonableness review. Central to the necessity of adequate justification is the perspective of the individual or party over whom authority is being exercised. Where the impact of a decision on an individual's rights and interests is severe, the reasons provided to that individual must reflect the stakes. The principle of responsive justification means that if a decision has particularly harsh consequences for the affected individual, the decision maker must explain why its decision best reflects the legislature's intention. This includes decisions with consequences that threaten an individual's life, liberty, dignity or livelihood.

[134] Moreover, concerns regarding arbitrariness will generally be more acute in cases where the consequences of the decision for the affected party are particularly severe or harsh, and a failure to grapple with such consequences may well be unreasonable. For example, this Court has held that the Immigration Appeal Division should, when exercising its equitable jurisdiction to stay a removal order under the *Immigration and Refugee Protection Act*, consider the potential foreign hardship a deported person would face: *Chieu v. Canada (Minister of*

d'un organisme administratif. Lorsqu'elle dispose d'une preuve concernant l'existence d'un désaccord au sein d'un organisme administratif sur la façon de trancher des questions de droit, une cour de révision pourrait estimer opportun d'en faire mention dans ses motifs et d'encourager le recours aux mécanismes internes pour résoudre le désaccord. Et si le désaccord interne persiste, il pourrait devenir de plus en plus difficile pour l'organisme administratif de justifier des décisions qui ne serviraient qu'à perpétuer la discorde.

g) *L'incidence de la décision sur l'individu visé*

[133] Il est bien établi que les individus ont droit à une plus grande protection procédurale lorsque la décision sous examen est susceptible d'avoir des répercussions personnelles importantes ou de leur causer un grave préjudice : *Baker*, par. 25. Toutefois, ce principe a également une incidence sur la manière dont une cour de justice effectue un contrôle selon la norme de la décision raisonnable. Le point de vue de la partie ou de l'individu sur lequel l'autorité est exercée est au cœur de la nécessité d'une justification adéquate. Lorsque la décision a des répercussions sévères sur les droits et intérêts de l'individu visé, les motifs fournis à ce dernier doivent refléter ces enjeux. Le principe de la justification adaptée aux questions et préoccupations soulevées veut que le décideur explique pourquoi sa décision reflète le mieux l'intention du législateur, malgré les conséquences particulièrement graves pour l'individu concerné. Cela vaut notamment pour les décisions dont les conséquences menacent la vie, la liberté, la dignité ou les moyens de subsistance d'un individu.

[134] En outre, les préoccupations relatives à l'arbitraire sont généralement plus prononcées dans les cas où la décision a des conséquences particulièrement graves ou sévères pour la partie visée et le défaut de traiter de ces conséquences peut fort bien se révéler déraisonnable. Par exemple, notre Cour a statué qu'au moment d'exercer sa compétence en equity pour ordonner un sursis à l'exécution d'une mesure de renvoi en vertu de la *Loi sur l'immigration et la protection des réfugiés*, la section d'appel de l'immigration devait tenir compte des difficultés que risque

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Citizenship and Immigration), 2002 SCC 3, [2002] 1 S.C.R. 84.

[135] Many administrative decision makers are entrusted with an extraordinary degree of power over the lives of ordinary people, including the most vulnerable among us. The corollary to that power is a heightened responsibility on the part of administrative decision makers to ensure that their reasons demonstrate that they have considered the consequences of a decision and that those consequences are justified in light of the facts and law.

F. *Review in the Absence of Reasons*

[136] Where the duty of procedural fairness or the legislative scheme mandates that reasons be given to the affected party but none have been given, this failure will generally require the decision to be set aside and the matter remitted to the decision maker: see, e.g., *Congrégation des témoins de Jéhovah de St-Jérôme-Lafontaine*, at para. 35. Also, where reasons are provided but they fail to provide a transparent and intelligible justification as explained above, the decision will be unreasonable. In many cases, however, neither the duty of procedural fairness nor the statutory scheme will require that formal reasons be given at all: *Baker*, at para. 43.

[137] Admittedly, applying an approach to judicial review that prioritizes the decision maker's justification for its decisions can be challenging in cases in which formal reasons have not been provided. This will often occur where the decision-making process does not easily lend itself to producing a single set of reasons, for example, where a municipality passes a bylaw or a law society renders a decision by holding a vote: see, e.g., *Catalyst*; *Green*; *Trinity Western University*. However, even in such circumstances, the reasoning process that underlies the decision will not usually be opaque. It is important to recall that a reviewing court must look to the record as a whole to understand the decision, and that in doing so, the court will often uncover a clear rationale for the decision: *Baker*, at para. 44. For example, as McLachlin C.J. noted in *Catalyst*, "[t]he reasons for

de connaître la personne concernée à l'étranger par suite de son expulsion : *Chieu c. Canada (Ministre de la Citoyenneté et de l'Immigration)*, 2002 CSC 3, [2002] 1 R.C.S. 84.

[135] Bon nombre de décideurs administratifs se voient confier des pouvoirs extraordinaires sur la vie de gens ordinaires, dont beaucoup sont parmi les plus vulnérables de notre société. Le corollaire de ce pouvoir est la responsabilité accrue qui échoit aux décideurs administratifs de s'assurer que leurs motifs démontrent qu'ils ont tenu compte des conséquences d'une décision et que ces conséquences sont justifiées au regard des faits et du droit.

F. *Le contrôle en l'absence de motifs*

[136] Lorsque l'obligation d'équité procédurale ou le régime législatif appellent la communication de motifs à la partie touchée mais qu'aucuns motifs n'ont été donnés, la décision doit généralement être infirmée et l'affaire, renvoyée au décideur : voir, p. ex., *Congrégation des témoins de Jéhovah de St-Jérôme-Lafontaine*, par. 35. En outre, si des motifs sont communiqués, mais que ceux-ci ne justifient pas la décision de manière transparente et intelligible comme nous l'avons expliqué, la décision sera déraisonnable. Dans de nombreux cas toutefois, ni l'obligation d'équité procédurale ni le régime législatif applicable ne requerra la présentation de motifs écrits : *Baker*, par. 43.

[137] Certes, il est parfois difficile d'employer une méthode de contrôle judiciaire qui accorde la priorité à la justification, par le décideur, de ses décisions dans les cas où aucuns motifs écrits ne sont communiqués. Il en sera souvent ainsi dans le cas où le processus décisionnel ne se prête pas facilement à la production d'une seule série de motifs, par exemple lorsqu'une municipalité adopte un règlement ou lorsqu'un barreau rend une décision au moyen de la tenue d'un vote : voir, p. ex., *Catalyst*; *Green*; *Trinity Western University*. Toutefois, même en pareil cas, le raisonnement qui sous-tend la décision n'est normalement pas opaque. Il importe de rappeler qu'une cour de révision doit examiner le dossier dans son ensemble pour comprendre la décision et qu'elle découvrira alors souvent une justification claire pour la décision : *Baker*, par. 44. Par exemple, comme

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a municipal bylaw are traditionally deduced from the debate, deliberations and the statements of policy that give rise to the bylaw": para. 29. In that case, not only were "the reasons [in the sense of rationale] for the bylaw . . . clear to everyone", they had also been laid out in a five-year plan: para. 33. Conversely, even without reasons, it is possible for the record and the context to reveal that a decision was made on the basis of an improper motive or for another impermissible reason, as, for example, in *Roncarelli*.

[138] There will nonetheless be situations in which no reasons have been provided and neither the record nor the larger context sheds light on the basis for the decision. In such a case, the reviewing court must still examine the decision in light of the relevant constraints on the decision maker in order to determine whether the decision is reasonable. But it is perhaps inevitable that without reasons, the analysis will then focus on the outcome rather than on the decision maker's reasoning process. This does not mean that reasonableness review is less robust in such circumstances, only that it takes a different shape.

G. *A Note on Remedial Discretion*

[139] Where a court reviews an administrative decision, the question of the appropriate remedy is multi-faceted. It engages considerations that include the reviewing court's common law or statutory jurisdiction and the great diversity of elements that may influence a court's decision to exercise its discretion in respect of available remedies. While we do not aim to comprehensively address here the issue of remedies on judicial review, we do wish to briefly address the question of whether a court that quashes an unreasonable decision should exercise its discretion to remit the matter to the decision maker for reconsideration with the benefit of the court's reasons.

la juge en chef McLachlin l'a souligné dans l'arrêt *Catalyst*, « [l]es motifs qui sous-tendent un règlement municipal se dégagent habituellement du débat, des délibérations et des énoncés de politique d'où il prend sa source » : par. 29. Dans cette affaire, non seulement « les motifs qui sous-tendaient le règlement contesté étaient clairs pour tous », mais ils avaient en outre été exposés dans un plan quinquennal : par. 33. À l'inverse, même en l'absence de motifs, il se peut que le dossier et le contexte révèlent qu'une décision repose sur un mobile irrégulier ou sur un autre motif inacceptable, comme dans l'arrêt *Roncarelli*.

[138] Il existe néanmoins des situations dans lesquelles aucuns motifs n'ont été fournis et où ni le dossier ni le contexte général ne permettent de discerner le fondement de la décision en cause. En pareil cas, la cour de révision doit tout de même examiner la décision à la lumière des contraintes imposées au décideur afin de déterminer s'il s'agit d'une décision raisonnable. Toutefois, il est peut-être inévitable que faute de motifs, l'analyse soit alors centrée sur le résultat plutôt que sur le raisonnement du décideur. Il ne s'ensuit pas pour autant que le contrôle selon la norme de la décision raisonnable est moins rigoureux dans ces circonstances; il prend seulement une forme différente.

G. *Un mot sur le pouvoir discrétionnaire en matière de réparation*

[139] La question de la réparation qu'il convient d'accorder dans les cas où une cour procède au contrôle d'une décision administrative revêt de multiples facettes. Cela fait intervenir des considérations comme la common law ou la compétence que confère la loi à la cour de révision, ainsi que la grande diversité d'éléments pouvant influer sur la décision d'une cour d'exercer son pouvoir discrétionnaire à l'égard des réparations possibles. Bien que nous n'entendions pas procéder ici à une analyse complète de la question des réparations dans le cadre d'un contrôle judiciaire, nous souhaitons toutefois aborder brièvement la question de savoir si la cour qui casse une décision déraisonnable devrait exercer son pouvoir discrétionnaire de renvoyer l'affaire pour réexamen à la lumière des motifs donnés par la cour.

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[140] Where the reasonableness standard is applied in conducting a judicial review, the choice of remedy must be guided by the rationale for applying that standard to begin with, including the recognition by the reviewing court that the legislature has entrusted the matter to the administrative decision maker, and not to the court, to decide: see *Delta Air Lines*, at para. 31. However, the question of remedy must also be guided by concerns related to the proper administration of the justice system, the need to ensure access to justice and "the goal of expedient and cost-efficient decision making, which often motivates the creation of specialized administrative tribunals in the first place": *Alberta Teachers*, at para. 55.

[141] Giving effect to these principles in the remedial context means that where a decision reviewed by applying the reasonableness standard cannot be upheld, it will most often be appropriate to remit the matter to the decision maker to have it reconsider the decision, this time with the benefit of the court's reasons. In reconsidering its decision, the decision maker may arrive at the same, or a different, outcome: see *Delta Air Lines*, at paras. 30-31.

[142] However, while courts should, as a general rule, respect the legislature's intention to entrust the matter to the administrative decision maker, there are limited scenarios in which remitting the matter would stymie the timely and effective resolution of matters in a manner that no legislature could have intended: *D'Errico v. Canada (Attorney General)*, 2014 FCA 95, 459 N.R. 167, at paras. 18-19. An intention that the administrative decision maker decide the matter at first instance cannot give rise to an endless merry-go-round of judicial reviews and subsequent reconsiderations. Declining to remit a matter to the decision maker may be appropriate where it becomes evident to the court, in the course of its review, that a particular outcome is inevitable and that remitting the case would therefore serve no useful purpose: see *Mobil Oil Canada Ltd. v. Canada-Newfoundland Offshore Petroleum Board*, [1994] 1 S.C.R. 202, at pp. 228-30; *Renaud v. Quebec (Commission des affaires sociales)*, [1999] 3 S.C.R. 855; *Groia v. Law Society of Upper Canada*,

[140] Lorsque la cour de révision applique la norme de la décision raisonnable au moment d'effectuer un contrôle judiciaire, le choix de la réparation doit être guidé par la raison d'être de l'application de cette norme, y compris le fait pour la cour de révision de reconnaître que le législateur a confié le règlement de l'affaire à un décideur administratif, et non à une cour : voir *Delta Air Lines*, par. 31. Toutefois, l'examen de la question de la réparation doit aussi être guidé par les préoccupations liées à la bonne administration du système de justice, à la nécessité d'assurer l'accès à la justice et à « la volonté de mettre sur pied un processus décisionnel à la fois rapide et économique qui préside souvent au départ à la création d'un tribunal administratif spécialisé » : *Alberta Teachers*, par. 55.

[141] Donner effet à ces principes dans le contexte de la réparation signifie que, lorsque la décision contrôlée selon la norme de la décision raisonnable ne peut être confirmée, il conviendra le plus souvent de renvoyer l'affaire au décideur pour qu'il revoie la décision, mais à la lumière cette fois des motifs donnés par la cour. Quand il revoit sa décision, le décideur peut alors arriver au même résultat ou à un résultat différent : voir *Delta Air Lines*, par. 30-31.

[142] Cependant, s'il convient, en règle générale, que les cours de justice respectent la volonté du législateur de confier l'affaire à un décideur administratif, il y a des situations limitées dans lesquelles le renvoi de l'affaire pour nouvel examen fait échec au souci de résolution rapide et efficace d'une manière telle qu'aucune législature n'aurait pu souhaiter : *D'Errico c. Canada (Procureur général)*, 2014 CAF 95, par. 18-19 (CanLII). L'intention que le décideur administratif tranche l'affaire en première instance ne saurait donner lieu à un va-et-vient interminable de contrôles judiciaires et de nouveaux examens. Le refus de renvoyer l'affaire au décideur peut s'avérer indiqué lorsqu'il devient évident aux yeux de la cour, lors de son contrôle judiciaire, qu'un résultat donné est inévitable, si bien que le renvoi de l'affaire ne servirait à rien : voir *Mobil Oil Canada Ltd. c. Office Canada-Terre-Neuve des hydrocarbures extracôtiers*, [1994] 1 R.C.S. 202, p. 228-230; *Renaud c. Québec (Commission des affaires sociales)*, [1999] 3 R.C.S. 855; *Groia c. Barreau du Haut-Canada*,

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2018 SCC 27, [2018] 1 S.C.R. 772, at para. 161; *Sharif v. Canada (Attorney General)*, 2018 FCA 205, 50 C.R. (7th) 1, at paras. 53-54; *Maple Lodge Farms Ltd. v. Canadian Food Inspection Agency*, 2017 FCA 45, 411 D.L.R. (4th) 175, at paras. 51-56 and 84; *Gehl v. Canada (Attorney General)*, 2017 ONCA 319, 138 O.R. (3d) 52, at paras. 54 and 88. Elements like concern for delay, fairness to the parties, urgency of providing a resolution to the dispute, the nature of the particular regulatory regime, whether the administrative decision maker had a genuine opportunity to weigh in on the issue in question, costs to the parties, and the efficient use of public resources may also influence the exercise of a court's discretion to remit a matter, just as they may influence the exercise of its discretion to quash a decision that is flawed: see *MiningWatch Canada v. Canada (Fisheries and Oceans)*, 2010 SCC 2, [2010] 1 S.C.R. 6, at paras. 45-51; *Alberta Teachers*, at para. 55.

IV. Role of Prior Jurisprudence

[143] Given that this appeal and its companion cases involve a recalibration of the governing approach to the choice of standard of review analysis and a clarification of the proper application of the reasonableness standard, it will be necessary to briefly address how the existing administrative law jurisprudence should be treated going forward. These reasons set out a holistic revision of the framework for determining the applicable standard of review. A court seeking to determine what standard is appropriate in a case before it should look to these reasons first in order to determine how this general framework applies to that case. Doing so may require the court to resolve subsidiary questions on which past precedents will often continue to provide helpful guidance. Indeed, much of the Court's jurisprudence, such as cases concerning general questions of law of central importance to the legal system as a whole or those relating to jurisdictional boundaries between two or more administrative bodies, will continue to apply essentially without modification. On other issues, certain cases —including those on the effect of statutory appeal mechanisms, "true" questions of jurisdiction or the former contextual analysis — will necessarily have less precedential force. As for cases that dictated how to conduct reasonableness

2018 CSC 27, [2018] 1 R.C.S. 772, par. 161; *Sharif c. Canada (Procureur général)*, 2018 CAF 205, par. 53-54 (CanLII); *Maple Lodge Farms Ltd. c. Agence canadienne d'inspection des aliments*, 2017 CAF 45, par. 51-56 et 84 (CanLII); *Gehl c. Canada (Attorney General)*, 2017 ONCA 319, 138 O.R. (3d) 52, par. 54 et 88. Les préoccupations concernant les délais, l'équité envers les parties, le besoin urgent de régler le différend, la nature du régime de réglementation donné, la possibilité réelle ou non pour le décideur administratif de se pencher sur la question en litige, les coûts pour les parties et l'utilisation efficace des ressources publiques peuvent aussi influer sur l'exercice par la cour de son pouvoir discrétionnaire de renvoyer l'affaire — tout comme ces facteurs peuvent influer sur l'exercice de son pouvoir discrétionnaire de casser une décision lacunaire : voir *Mines Alerte Canada c. Canada (Pêches et Océans)*, 2010 CSC 2, [2010] 1 R.C.S. 6, par. 45-51; *Alberta Teachers*, par. 55.

IV. Le rôle de la jurisprudence antérieure

[143] Puisque le présent pourvoi et les pourvois connexes impliquent un rajustement de la méthode à employer pour choisir la norme de contrôle ainsi qu'un éclaircissement de l'application appropriée de la norme de la décision raisonnable, il est nécessaire d'aborder brièvement la façon d'interpréter dorénavant la jurisprudence actuelle en droit administratif. Les présents motifs comportent une révision globale du cadre d'analyse qui sert à déterminer la norme de contrôle applicable. La cour de justice qui cherche à arrêter la norme de contrôle applicable dans une affaire dont elle est saisie devrait d'abord s'en remettre aux présents motifs pour savoir comment s'applique ce cadre général dans l'affaire en question. Il est ainsi possible que la cour soit appelée à trancher des questions subsidiaires à l'égard desquelles la jurisprudence continue de donner des indications utiles. En fait, une grande partie de la jurisprudence de notre Cour continue de s'appliquer essentiellement telle quelle : par exemple, les affaires portant sur des questions de droit générales d'importance capitale pour le système de justice dans son ensemble ou sur des questions liées aux délimitations des compétences respectives d'organismes administratifs. Pour d'autres catégories de questions, certains arrêts, dont ceux portant sur l'effet des mécanismes

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review, they will often continue to provide insight, but should be used carefully to ensure that their application is aligned in principle with these reasons.

[144] This approach strives for future doctrinal stability under the new framework while clarifying the continued relevance of the existing jurisprudence. Where a reviewing court is not certain how these reasons relate to the case before it, it may find it prudent to request submissions from the parties on both the appropriate standard and the application of that standard.

[145] Before turning to Mr. Vavilov's case, we pause to note that our colleagues mischaracterize the framework developed in these reasons as being an "encomium" for correctness, and a turn away from the Court's deferential approach to the point of being a "eulogy" for deference (at paras. 199 and 201). With respect, this is a gross exaggeration. Assertions that these reasons adopt a formalistic, court-centric view of administrative law (at paras. 229 and 240), enable an unconstrained expansion of correctness review (at para. 253) or function as a sort of checklist for "line-by-line" reasonableness review (at para. 284), are counter to the clear wording we use and do not take into consideration the delicate balance that we have accounted for in setting out this framework.

V. Mr. Vavilov's Application for Judicial Review

[146] The case at bar involves an application for judicial review of a decision made by the Canadian Registrar of Citizenship on August 15, 2014. The Registrar's decision concerned Mr. Vavilov, who was born in Canada and whose parents were later revealed to be undercover Russian spies. The Registrar

d'appel prévus par la loi, sur des questions touchant « véritablement » à la compétence ou sur l'ancienne analyse contextuelle, auront forcément une valeur de précédent moindre. En ce qui concerne les arrêts qui établissent la manière dont il faut procéder au contrôle selon la norme de la décision raisonnable, ils garderont en général leur utilité, mais il convient d'y recourir prudemment et de faire en sorte que leur application cadre avec les principes énoncés dans les présents motifs.

[144] Cette approche vise à assurer une stabilité doctrinale pour l'avenir selon le nouveau cadre d'analyse tout en clarifiant en même temps la pertinence continue de notre jurisprudence actuelle. Si une cour de révision ne sait pas avec certitude en quoi les présents motifs se rapportent à l'affaire dont elle est saisie, elle peut estimer prudent de demander aux parties de présenter des observations tant sur la norme de contrôle indiquée que sur l'application de celle-ci.

[145] Avant de passer au cas de M. Vavilov, nous signalons que nos collègues dénaturent le cadre d'analyse élaboré dans les présents motifs lorsqu'elles affirment qu'il fait l'« apologie » de la norme de la décision correcte et délaisse l'approche empreinte de déférence de la Cour au point de « sonne[r] le glas » du principe de la déférence (par. 199 et 201). Avec égards, il s'agit d'une grossière exagération. Affirmer que les présents motifs reprennent une conception formaliste du droit administratif centrée sur les cours (par. 229 et 240), permettent une expansion illimitée du contrôle selon la norme de la décision correcte (par. 253), ou constituent une espèce de liste de vérification pour effectuer un contrôle « ligne par ligne » en fonction de la norme de la décision raisonnable (par. 284) va à l'encontre du libellé clair que nous utilisons et ne prend pas en considération l'équilibre délicat dont nous avons tenu compte en formulant ce cadre d'analyse.

V. La demande de contrôle judiciaire de M. Vavilov

[146] En l'espèce, nous sommes en présence d'une demande de contrôle judiciaire d'une décision rendue par la greffière de la citoyenneté canadienne le 15 août 2014. La décision de la greffière concerne M. Vavilov, qui est né au Canada de parents qui se sont plus tard révélés être des espions russes infiltrés. Se

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determined that Mr. Vavilov was not a Canadian citizen on the basis of an interpretation of s. 3(2)(a) of the *Citizenship Act* and cancelled his certificate of citizenship under s. 26(3) of the *Citizenship Regulations*. We conclude that the standard of review applicable to the Registrar's decision is reasonableness, and that the Registrar's decision was unreasonable. We would uphold the decision of the Federal Court of Appeal to quash the Registrar's decision and would not remit the matter to the Registrar for redetermination.

A. *Facts*

[147] Mr. Vavilov was born in Toronto as Alexander Foley on June 3, 1994. At the time of his birth, his parents were posing as Canadians under the assumed names of Tracey Lee Ann Foley and Donald Howard Heathfield. In reality, they were Elena Vavilova and Andrey Bezrukov, two foreign nationals working on a long-term assignment for the Russian foreign intelligence service, the SVR. Their false Canadian identities had been assumed prior to the birth of Mr. Vavilov and of his older brother, Timothy, for purposes of a "deep cover" espionage network under the direction of the SVR. The United States Department of Justice refers to it as the "illegals" program.

[148] Ms. Vavilova and Mr. Bezrukov were deployed to Canada to establish false personal histories as Western citizens. They worked, ran a business, pursued higher education and, as noted, had two children here. After their second son was born, the family moved to France, and later to the United States. In the United States, Mr. Bezrukov obtained a Masters of Public Administration at Harvard University and worked as a consultant, all while working to collect information on a variety of sensitive national security issues for the SVR. The nature of the undercover work of Ms. Vavilova and Mr. Bezrukov meant that there was no point at which either of them had any publicly acknowledged affiliation with the Russian state, held any official diplomatic or consular status, or had been granted any diplomatic privilege or immunity.

fondant sur une interprétation de l'al. 3(2)a) de la *Loi sur la citoyenneté*, la greffière a décidé que M. Vavilov n'était pas citoyen canadien et a annulé son certificat de citoyenneté en application du par. 26(3) du *Règlement sur la citoyenneté*. Nous concluons que la norme de contrôle applicable à la décision de la greffière est celle de la décision raisonnable, et que la décision de la greffière est déraisonnable. Nous sommes d'avis de confirmer l'arrêt de la Cour d'appel fédérale cassant la décision de la greffière. Nous ne renverrions pas l'affaire à la greffière pour nouvel examen.

A. *Les faits*

[147] Monsieur Vavilov naît à Toronto le 3 juin 1994 sous le nom d'Alexander Foley. Au moment de sa naissance, ses parents se font passer pour des Canadiens en utilisant les noms d'emprunt de Tracey Lee Ann Foley et de Donald Howard Heathfield. En fait, ses parents s'appellent Elena Vavilova et Andrey Bezrukov et sont des étrangers en mission de longue durée pour le Service des renseignements étrangers de la Russie, le SVR. Les parents de M. Vavilov ont pris ces fausses identités canadiennes avant la naissance de ce dernier et de son frère aîné, Timothy, pour les besoins d'un réseau d'espionnage [TRADUCTION] « clandestin » relevant du SVR. Le département de la Justice des États-Unis y réfère comme étant le programme des « illégaux ».

[148] Madame Vavilova et M. Bezrukov ont été envoyés au Canada dans le but de se créer de faux antécédents personnels en tant que citoyens occidentaux. Ils ont occupé des emplois, dirigé une entreprise, fait des études supérieures et, rappelons-le, eu deux enfants au Canada. Après la naissance de leur deuxième fils, la famille déménage en France, et plus tard aux États-Unis. Là-bas, M. Bezrukov obtient une maîtrise en administration publique de l'Université Harvard et travaille comme consultant tout en recueillant des renseignements sur diverses questions délicates de sécurité nationale pour le compte du SVR. Étant donné la nature de leur mission d'infiltration, M^me^ Vavilova et M. Bezrukov n'ont jamais reconnu publiquement avoir une quelconque affiliation avec l'État russe. Ils n'ont jamais détenu quelque statut diplomatique ou consulaire officiel que ce soit. Ils n'ont jamais non plus bénéficié d'un privilège ou d'une immunité diplomatique.

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[149] Until he was about 16 years old, Mr. Vavilov did not know that his parents were not who they claimed to be. He believed that he was a Canadian citizen by birth, lived and identified as a Canadian, held a Canadian passport, learned both official languages and was proud of his heritage. His parents' true identities became known to him on June 27, 2010, when they were arrested in the United States and charged (along with several other individuals) with conspiracy to act as unregistered agents of a foreign government. On July 8, 2010, they pled guilty, admitted their status as Russian citizens acting on behalf of the Russian state, and were returned to Russia in a "spy swap" the following day. Mr. Vavilov has described the revelation as a traumatic event characterized by disbelief and a crisis of identity.

[150] Just prior to his parents' deportation, Mr. Vavilov left the United States with his brother on a trip that had been planned before their parents' arrest, going first to Paris, and then to Russia on a tourist visa. In October 2010, Mr. Vavilov unsuccessfully attempted to renew his Canadian passport through the Canadian Embassy in Moscow. Although he submitted to DNA testing and changed his surname from Foley to Vavilov at the behest of passport authorities, his second attempt to obtain a Canadian passport in December 2011 was also unsuccessful. He was then informed that despite his Canadian birth certificate, he would also need to obtain and provide a certificate of Canadian citizenship before he would be issued a passport. Mr. Vavilov applied for that certificate in October 2012, and it was issued to him on January 15, 2013. At that point, he made another passport application through the Canadian Embassy in Buenos Aires, Argentina, and, after a delay, applied for mandamus, a process that was settled out of court in June 2013. The Minister of Citizenship and Immigration undertook to issue a new travel document to Mr. Vavilov by July 19, 2013.

[151] However, Mr. Vavilov never received a passport. Instead, he received a "procedural fairness

[149] Jusqu'à l'âge d'environ 16 ans, M. Vavilov ne sait pas que ses parents ne sont pas ceux qu'ils prétendent être. Il croit être citoyen canadien de naissance. Il vit et s'identifie comme un Canadien, et il détient un passeport canadien. Il apprend les deux langues officielles et est fier de ses origines. Il apprend la véritable identité de ses parents le 27 juin 2010, lorsqu'ils sont arrêtés aux États-Unis et accusés (avec plusieurs autres individus) de complot en vue d'agir en tant qu'agents non accrédités d'un gouvernement étranger. Le 8 juillet 2010, ses parents plaident coupables et admettent leur statut de citoyens de la Russie agissant au nom de l'État russe. Le lendemain, ils sont renvoyés en Russie dans le cadre d'un [TRADUCTION] « échange d'espions ». Selon M. Vavilov, cette révélation est pour lui un événement traumatisant marqué par l'incrédulité et une crise d'identité.

[150] Juste avant l'expulsion de ses parents, M. Vavilov quitte les États-Unis en compagnie de son frère pour effectuer un voyage prévu avant l'arrestation de leurs parents. Ils se rendent d'abord à Paris, puis en Russie munis de visas de touristes. En octobre 2010, M. Vavilov tente en vain de renouveler son passeport canadien par l'entremise de l'ambassade du Canada à Moscou. Même s'il se soumet à un test d'ADN et change son nom de famille Foley pour Vavilov à la demande des autorités chargées de délivrer les passeports, sa deuxième demande de passeport canadien présentée en décembre 2011 est aussi rejetée. Les autorités l'informent ensuite que même s'il possède un certificat de naissance canadien, il doit également obtenir et fournir un certificat de citoyenneté canadienne avant de pouvoir obtenir un passeport. Monsieur Vavilov présente une demande de certificat de citoyenneté canadienne en octobre 2012 et obtient ce certificat le 15 janvier 2013. À ce moment-là, il présente une autre demande de passeport par l'entremise de l'ambassade du Canada à Buenos Aires, en Argentine. Cette demande fait l'objet d'un règlement extrajudiciaire en juin 2013 après que M. Vavilov ait déposé une demande de bref de *mandamus*. Le ministre de la Citoyenneté et de l'Immigration s'engage alors à lui délivrer un nouveau titre de voyage au plus tard le 19 juillet 2013.

[151] M. Vavilov ne reçoit cependant jamais de passeport. Il reçoit plutôt une lettre dite « d'équité

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letter" from the Canadian Registrar of Citizenship dated July 18, 2013 in which the Registrar stated that Mr. Vavilov had not been entitled to a certificate of citizenship, that his certificate of citizenship had been issued in error and that, pursuant to s. 3(2)(a) of the *Citizenship Act*, he was not a citizen of Canada. Mr. Vavilov was invited to make submissions in response, and he did so. On August 15, 2014, the Registrar formally cancelled Mr. Vavilov's Canadian citizenship certificate pursuant to s. 26(3) of the *Citizenship Regulations*.

B. *Procedural History*

(1) Registrar's Decision

[152] In a brief letter sent to Mr. Vavilov on August 15, 2014, the Registrar informed him that she was cancelling his certificate of citizenship pursuant to s. 26(3) of the *Citizenship Regulations* on the basis that he was not entitled to it. The Registrar summarized her position as follows:

(a) Although Mr. Vavilov was born in Toronto, neither of his parents was a citizen of Canada, and neither of them had been lawfully admitted to Canada for permanent residence at the time of his birth.

(b) In 2010, Mr. Vavilov's parents were convicted of "conspiracy to act in the United States as a foreign agent of a foreign government", and recognized as unofficial agents working as "illegals" for the SVR.

(c) As a result, the Registrar believed that, at the time of Mr. Vavilov's birth, his parents were "employees or representatives of a foreign government".

(d) Accordingly, pursuant to s. 3(2)(a) of the *Citizenship Act*, Mr. Vavilov had never been a Canadian citizen and had not been entitled to receive the certificate of Canadian citizenship that had been issued to him in 2013. Section 3(2)(a) provides that s. 3(1)(a) of the *Citizenship Act* (which grants citizenship by birth to persons born in Canada after February 14, 1977) does not apply

procédurale » de la greffière de la citoyenneté canadienne datée du 18 juillet 2013. Dans cette lettre, la greffière l'informe qu'il n'a jamais eu le droit d'obtenir un certificat de citoyenneté, que son certificat de citoyenneté lui a été délivré par erreur, et qu'il n'est pas un citoyen canadien suivant l'al. 3(2)a) de la *Loi sur la citoyenneté*. La greffière invite M. Vavilov à présenter des observations en réponse à cette lettre, ce qu'il fait. Le 15 août 2014, la greffière annule officiellement le certificat de citoyenneté canadienne de M. Vavilov en application du par. 26(3) du *Règlement sur la citoyenneté*.

B. *L'historique des procédures*

(1) La décision de la greffière

[152] Dans une brève lettre envoyée à M. Vavilov le 15 août 2014, la greffière informe ce dernier qu'elle annule son certificat de citoyenneté en application du par. 26(3) du *Règlement sur la citoyenneté* pour le motif qu'il n'a pas droit à un tel certificat. La greffière résume ainsi sa position :

a) Bien que M. Vavilov soit né à Toronto, ses parents n'avaient qualité ni de citoyens canadiens ni de résidents permanents au moment de sa naissance.

b) En 2010, les parents de M. Vavilov ont été reconnus coupables de [TRADUCTION] « complot en vue d'agir en tant qu'agents étrangers d'un gouvernement étranger aux États-Unis » et considérés comme des agents non officiels travaillant en tant qu'« illégaux » pour le compte du SVR.

c) Pour cette raison, la greffière estime qu'au moment de la naissance de M. Vavilov, ses parents étaient [TRADUCTION] « représentants ou au service d'un gouvernement étranger ».

d) Par conséquent, suivant l'al. 3(2)a) de la *Loi sur la citoyenneté*, M. Vavilov n'a jamais été un citoyen canadien et n'a jamais eu le droit d'obtenir le certificat de citoyenneté canadienne qui lui a été délivré en 2013. Selon cette disposition, l'al. 3(1)a) de la *Loi sur la citoyenneté* (au titre duquel obtient la citoyenneté toute personne née au Canada après le 14 février 1977) ne s'applique

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to an individual if, at the time of the individual's birth, neither of their parents was a citizen or lawfully admitted to Canada for permanent residence and either parent was "a diplomatic or consular officer or other representative or employee in Canada of a foreign government."

[153] For these reasons, the Registrar cancelled the certificate and indicated that Mr. Vavilov would no longer be recognized as a Canadian citizen. The Registrar's letter did not offer any analysis or interpretation of s. 3(2)(a) of the *Citizenship Act*. However, it appears that in coming to her decision, the Registrar relied on a 12-page report prepared by a junior analyst, which included an interpretation of this key statutory provision.

[154] In that report, the analyst provided a timeline of the procedural history of Mr. Vavilov's file, a summary of the investigation into and charges against his parents in the United States, and background information on the SVR's "illegals" program. The analyst also discussed several provisions of the *Citizenship Act*, including s. 3(2)(a), and it is this aspect of her report that is most relevant to Mr. Vavilov's application for judicial review. The analyst's ultimate conclusion was that the certificate of citizenship issued to Mr. Vavilov in January 2013 was issued in error, as his parents had been "working as employees or representatives of a foreign government (the Russian Federation) during the time they resided in Canada, including at the time of Mr. Vavilov's birth", and that "[a]s such, Mr. Vavilov was not entitled to receive a citizenship certificate pursuant to paragraph 3(2)(a) of the *Citizenship Act*": A.R., vol. I, at p. 3. The report was dated June 24, 2014.

[155] In discussing the relevant legislation, the analyst cited s. 3(1)(a) of the *Citizenship Act*, which establishes the general rule that persons born in Canada after February 14, 1977 are Canadian citizens. The analyst also referred to an exception to that general rule set out in s. 3(2) of the *Citizenship Act*, which reads as follows:

(2) Paragraph (1)(a) does not apply to a person if, at the time of his birth, neither of his parents was a citizen or

pas à la personne dont les parents, au moment de sa naissance, n'avaient qualité ni de citoyens ni de résidents permanents et dont le père ou la mère était « agent diplomatique ou consulaire, représentant à un autre titre ou au service au Canada d'un gouvernement étranger ».

[153] Pour ces motifs, la greffière annule le certificat de M. Vavilov et déclare que ce dernier ne sera plus reconnu comme un citoyen canadien. La lettre de la greffière ne contient aucune analyse ou interprétation de l'al. 3(2)a) de la *Loi sur la citoyenneté*. Toutefois, il semble que pour en arriver à sa décision, la greffière se soit appuyée sur un rapport de 12 pages rédigé par une analyste subalterne qui comprend une interprétation de cette disposition législative clé.

[154] Dans ce rapport, l'analyste présente la chronologie de l'historique des procédures relatives au dossier de M. Vavilov, un résumé de l'enquête menée au sujet de ses parents et des accusations portées contre eux aux États-Unis, ainsi que des renseignements généraux sur le programme des « illégaux » du SVR. L'analyste y parle aussi de plusieurs dispositions de la *Loi sur la citoyenneté*, dont l'al. 3(2)a), soit l'élément de son rapport le plus pertinent pour la demande de contrôle judiciaire de M. Vavilov. L'analyste conclut finalement que le certificat de citoyenneté qu'a obtenu M. Vavilov en janvier 2013 lui a été délivré par erreur parce que ses parents étaient [TRADUCTION] « représentants ou au service d'un gouvernement étranger (la Fédération de Russie) pendant leur séjour au Canada, y compris au moment de la naissance de M. Vavilov », et que « [e]n conséquence, M. Vavilov n'avait pas le droit d'obtenir un certificat de citoyenneté selon l'alinéa 3(2)a) de la *Loi sur la citoyenneté* » (d.a., vol. I, p. 3). Le rapport est daté du 24 juin 2014.

[155] Dans son étude de la loi applicable, l'analyste cite l'al. 3(1)a) de la *Loi sur la citoyenneté*, qui établit que toute personne née au Canada après le 14 février 1977 a qualité de citoyen canadien. Elle ajoute qu'une exception à cette règle générale figure au par. 3(2) de la *Loi sur la citoyenneté*, lequel est ainsi rédigé :

(2) L'alinéa (1)a) ne s'applique pas à la personne dont, au moment de la naissance, les parents n'avaient qualité

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lawfully admitted to Canada for permanent residence and either of his parents was

(a) a diplomatic or consular officer or other representative or employee in Canada of a foreign government;

(b) an employee in the service of a person referred to in paragraph (a); or

(c) an officer or employee in Canada of a specialized agency of the United Nations or an officer or employee in Canada of any other international organization to whom there are granted, by or under any Act of Parliament, diplomatic privileges and immunities certified by the Minister of Foreign Affairs to be equivalent to those granted to a person or persons referred to in paragraph (a).

[156] The analyst noted that s. 3(2)(a) refers both to diplomatic and consular officers and to *other* representatives or employees of a foreign government. She acknowledged that the term "diplomatic or consular officer" is defined in s. 35(1) of the *Interpretation Act* and that the definition lists a large number of posts within a foreign mission or consulate. However, the analyst observed that no statutory definition exists for the phrase "other representative or employee in Canada of a foreign government".

[157] The analyst compared the wording of s. 3(2)(a) with that of a similar provision in predecessor legislation. That provision, s. 5(3)(b) of the *Canadian Citizenship Act*, R.S.C. 1970, c. C-19, excluded from citizenship children whose "responsible parent" at the time of birth was:

(i) a foreign diplomatic or consular officer or a representative of a foreign government accredited to Her Majesty,

(ii) an employee of a foreign government attached to or in the service of a foreign diplomatic mission or consulate in Canada, or

(iii) an employee in the service of a person referred to in subparagraph (i).

ni de citoyens ni de résidents permanents et dont le père ou la mère était :

a) agent diplomatique ou consulaire, représentant à un autre titre ou au service au Canada d'un gouvernement étranger;

b) au service d'une personne mentionnée à l'alinéa a);

c) fonctionnaire ou au service, au Canada, d'une organisation internationale — notamment d'une institution spécialisée des Nations Unies — bénéficiant sous le régime d'une loi fédérale de privilèges et immunités diplomatiques que le ministre des Affaires étrangères certifie être équivalents à ceux dont jouissent les personnes visées à l'alinéa a).

[156] L'analyste fait remarquer que le terme « agent diplomatique ou consulaire » ainsi que l'expression « représentant *à un autre titre* ou au service au Canada d'un gouvernement étranger » sont utilisés à l'al. 3(2)a). Elle reconnaît que le terme « agent diplomatique ou consulaire » est défini au par. 35(1) de la *Loi d'interprétation*, et qu'il comprend un grand nombre de postes auprès d'une mission étrangère ou un consulat. Elle fait par contre remarquer que l'expression « représentant à un autre titre ou au service au Canada d'un gouvernement étranger » n'est définie nulle part dans la législation.

[157] L'analyste compare le libellé de l'al. 3(2)a) de la *Loi sur la citoyenneté* à celui d'une disposition semblable de la loi qui l'a précédée. Cette disposition — l'al. 5(3)b) de la *Loi sur la citoyenneté canadienne*, S.R.C. 1970, c. C-19 — excluait du droit à la citoyenneté canadienne les enfants dont le « parent responsable » était, au moment de leur naissance :

(i) un agent diplomatique ou consulaire étranger ou un représentant d'un gouvernement étranger accrédité auprès de Sa Majesté,

(ii) un employé d'un gouvernement étranger, attaché à une mission diplomatique ou à un consulat au Canada, ou au service d'une telle mission ou d'un tel consulat, ou

(iii) un employé au service d'une personne mentionnée au sous-alinéa (i).

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[158] The analyst reasoned that because s. 3(2)(a) "makes reference to 'representatives or employees of a foreign government', but does not link the representatives or employees to 'attached to or in the service of a foreign diplomatic mission or consulate in Canada' (as did the earlier version of the provision), it is reasonable to maintain that this provision intends to encompass individuals not included in the definition of 'diplomatic and consular staff'": A.R., vol. I, at p. 7.

[159] Although the analyst acknowledged that "Ms. Vavilova and Mr. Bezrukov, were employed in Canada by a foreign government without the benefits or protections (i.e.: immunity) that accompany diplomatic, consular, or official status positions", she concluded that they were nonetheless "unofficial employees or representatives" of Russia at the time of Mr. Vavilov's birth: A.R., vol. I, at p. 13. The exception in s. 3(2)(a) of the *Citizenship Act*, as she interpreted it, therefore applied to Mr. Vavilov. As a result, the analyst recommended that the Canadian Registrar of Citizenship "recall" Mr. Vavilov's certificate on the basis that he was not, and had never been, entitled to citizenship: *ibid.*, at p. 14.

(2) Federal Court (Bell J.), 2015 FC 960, [2016] 2 F.C.R. 39

[160] Mr. Vavilov sought and was granted leave to bring an application for judicial review of the Registrar's decision in the Federal Court pursuant to s. 22.1 of the *Citizenship Act*. His application was dismissed.

[161] The Federal Court rejected Mr. Vavilov's argument that the Registrar had breached her duty of procedural fairness by failing to disclose the documentation that had prompted the procedural fairness letter. In the Federal Court's view, the Registrar had provided Mr. Vavilov sufficient information to allow him to meaningfully respond, and had thereby satisfied the requirements of procedural fairness in the circumstances.

[158] L'analyste en conclut que, puisque l'al. 3(2)a) [TRADUCTION] « parle de "représentant à un autre titre ou au service au Canada d'un gouvernement étranger" sans établir que cette personne est "attaché[e] à une mission diplomatique ou à un consulat au Canada" (comme c'était le cas dans la version antérieure de cette disposition), il est raisonnable de soutenir que cette disposition est censée englober les personnes qui ne sont pas visées par la définition du terme "personnel diplomatique et consulaire" » : d.a., vol. I, p. 7.

[159] Bien que l'analyste reconnaisse que [TRADUCTION] « M^me^ Vavilova et M. Bezrukov étaient au service au Canada d'un gouvernement étranger, mais ne bénéficiaient pas des avantages ou des protections (c.-à-d. l'immunité) dont jouissent les personnes affectées à des missions diplomatiques ou à des postes consulaires ou officiels », elle conclut néanmoins qu'ils étaient des « employés ou représentants non officiels » de la Russie au moment de la naissance de M. Vavilov : d.a., vol. I, p. 13. Selon son interprétation, l'exception prévue à l'al. 3(2)a) de la *Loi sur la citoyenneté* s'appliquait donc à M. Vavilov. En conséquence, l'analyste recommande que la greffière de la citoyenneté canadienne « rappelle » le certificat de M. Vavilov au motif qu'il n'avait pas droit à la citoyenneté et qu'il n'y avait d'ailleurs jamais eu droit : *ibid.*, p. 14.

(2) Cour fédérale (le juge Bell), 2015 CF 960, [2016] 2 R.C.F. 39

[160] Monsieur Vavilov demande et obtient l'autorisation de présenter une demande de contrôle judiciaire de la décision de la greffière devant la Cour fédérale en vertu de l'art. 22.1 de la *Loi sur la citoyenneté*. Sa demande est rejetée.

[161] La Cour fédérale écarte l'argument de M. Vavilov selon lequel la greffière avait manqué à son obligation d'équité procédurale en omettant de lui communiquer les documents qui ont donné lieu à l'envoi de la première lettre dite d'équité procédurale. Selon la Cour fédérale, la greffière a fourni suffisamment de renseignements à M. Vavilov pour qu'il puisse fournir des réponses valables; elle a donc respecté les exigences d'équité procédurale dans les circonstances.

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[162] The Federal Court also rejected Mr. Vavilov's challenge to the Registrar's interpretation of s. 3(2)(a) of the *Citizenship Act*. Applying the correctness standard, the Federal Court agreed with the Registrar that undercover foreign operatives living in Canada fall within the meaning of the phrase "diplomatic or consular officer or other representative or employee in Canada of a foreign government" in s. 3(2)(a). In the Federal Court's view, to interpret s. 3(2)(a) in any other way would render the phrase "other representative or employee in Canada of a foreign government" meaningless and would lead to the "absurd result" that "children of a foreign diplomat, registered at an embassy, who conducts spy operations, cannot claim Canadian citizenship by birth in Canada but children of those who enter unlawfully for the very same purpose, become Canadian citizens by birth": para. 25.

[163] Finally, the Federal Court was satisfied, given the evidence, that the Registrar's conclusion that Mr. Vavilov's parents had at the time of his birth been in Canada as part of an undercover operation for the Russian government was reasonable.

(3) Federal Court of Appeal (Stratas J.A. with Webb J.A. Concurring; Gleason J.A. Dissenting), 2017 FCA 132, [2018] 3 F.C.R. 75

[164] A majority of the Federal Court of Appeal allowed Mr. Vavilov's appeal from the Federal Court's judgment and quashed the Registrar's decision.

[165] The Court of Appeal unanimously rejected Mr. Vavilov's argument that he had been denied procedural fairness by the Registrar. In the Court of Appeal's view, the Registrar had provided Mr. Vavilov sufficient information in the procedural fairness letter to enable him to know the case to meet. Even if Mr. Vavilov had been entitled to more information at the time of that letter, the court indicated that his procedural fairness challenge would nevertheless have failed because he had subsequently obtained

[162] La Cour fédérale écarte également la contestation de M. Vavilov concernant l'interprétation qu'a faite la greffière de l'al. 3(2)a) de la *Loi sur la citoyenneté*. Appliquant la norme de la décision correcte, la Cour fédérale souscrit à l'opinion de la greffière selon laquelle les agents d'infiltration étrangers vivant au Canada sont visés par les mots « agent diplomatique ou consulaire, représentant à un autre titre ou au service au Canada d'un gouvernement étranger » de l'al. 3(2)a). Selon la Cour fédérale, interpréter l'al. 3(2)a) d'une autre façon aurait pour effet de rendre l'expression « représentant à un autre titre ou au service au Canada d'un gouvernement étranger » vide de sens et donnerait lieu à un « résultat absurde » : « les enfants d'un diplomate étranger qui travaille dans une ambassade et mène des opérations d'espionnage ne seraient pas citoyens canadiens de naissance, alors que les enfants de personnes qui sont entrées illégalement au Canada pour accomplir des opérations similaires le seraient » : par. 25.

[163] Enfin, la Cour fédérale se dit convaincue, étant donné la preuve, du caractère raisonnable de la conclusion de la greffière selon laquelle les parents de M. Vavilov étaient en mission clandestine au Canada pour le compte du gouvernement de la Russie au moment de sa naissance.

(3) Cour d'appel fédérale (le juge Stratas, avec l'accord du juge Webb; la juge Gleason, dissidente), 2017 CAF 132, [2018] 3 R.C.F. 75

[164] La Cour d'appel fédérale accueille à la majorité l'appel interjeté par M. Vavilov contre le jugement de la Cour fédérale et casse la décision de la greffière.

[165] La Cour d'appel rejette à l'unanimité l'argument de M. Vavilov voulant que la greffière n'ait pas fait preuve d'équité procédurale envers lui. Selon la Cour d'appel, la lettre dite d'équité procédurale de la greffière contenait suffisamment de renseignements pour que M. Vavilov puisse connaître les faits à réfuter. Même si M. Vavilov avait le droit d'obtenir un complément d'information lorsqu'il a reçu cette lettre, la cour précise que sa contestation fondée sur le manquement à l'équité procédurale aurait néanmoins

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that additional information through his own efforts and was able to make meaningful submissions.

[166] The Court of Appeal was also unanimously of the view that the appropriate standard of review for the Registrar's interpretation and application of s. 3(2)(a) of the *Citizenship Act* was reasonableness. It split, however, on the application of that standard to the Registrar's decision.

[167] The majority of the Court of Appeal concluded that the analyst's interpretation of s. 3(2)(a), which the Registrar had adopted, was unreasonable and that the Registrar's decision should be quashed. The analysis relied on by the Registrar on the statutory interpretation issue was confined to a consideration of the text of s. 3(2)(a) and an abbreviated review of its legislative history, which totally disregarded its purpose or context. In the majority's view, such a "cursory and incomplete approach to statutory interpretation" in a case such as this was indefensible: para. 44. Moreover, when the provision's purpose and its context were taken into account, the only reasonable conclusion was that the phrase "employee in Canada of a foreign government" in s. 3(2)(a) was meant to apply only to individuals who have been granted diplomatic privileges and immunities under international law. Because it was common ground that neither of Mr. Vavilov's parents had been granted such privileges or immunities, s. 3(2)(a) did not apply to him. The cancellation of his citizenship certificate on the basis of s. 3(2)(a) therefore could not stand, and Mr. Vavilov was entitled to Canadian citizenship under the *Citizenship Act*.

[168] The dissenting judge disagreed, finding that the Registrar's interpretation of s. 3(2)(a) was reasonable. According to the dissenting judge, the text of that provision admits of at least two rational interpretations: one that includes all employees of a foreign government and one that is restricted to those who have been granted diplomatic privileges and immunities. In the

été rejetée : grâce à ses propres efforts, il a réussi à obtenir par la suite des renseignements supplémentaires et il a été en mesure de présenter des arguments valables.

[166] La Cour d'appel statue à l'unanimité que l'interprétation et l'application de l'al. 3(2)a) de la *Loi sur la citoyenneté* par la greffière devraient être examinées selon la norme de la décision raisonnable. La cour est cependant partagée quant à l'application de cette norme à la décision de la greffière.

[167] La majorité de la Cour d'appel conclut que l'interprétation donnée par l'analyste à l'al. 3(2)a) et adoptée par la greffière était déraisonnable, si bien que la décision de la greffière doit être cassée. L'analyse sur laquelle s'est fondée la greffière au sujet de la question de l'interprétation de la loi ne consistait qu'en une étude du libellé de l'al. 3(2)a) et en un bref résumé de l'origine législative de cette disposition, lequel passait complètement sous silence son objet ou son contexte. De l'avis de la majorité, l'utilisation d'une « approche aussi superficielle et incomplète pour l'interprétation des lois » dans une affaire comme la présente n'est pas justifiable : par. 44. De plus, lorsque l'on prend en compte l'objet et le contexte de cette disposition, la seule conclusion raisonnable est que l'expression « au service au Canada d'un gouvernement étranger » énoncée à l'al. 3(2)a) ne doit s'appliquer qu'aux personnes à qui on avait accordé des privilèges et immunités diplomatiques reconnus en droit international. Comme les parties s'entendent pour dire que ni la mère ni le père de M. Vavilov ne s'étaient vu accorder de privilèges ou d'immunités diplomatiques, l'al. 3(2)a) ne lui est pas applicable. La décision d'annuler son certificat de citoyenneté en application de l'al. 3(2)a) ne peut donc pas être maintenue et M. Vavilov a droit à la citoyenneté canadienne en vertu de la *Loi sur la citoyenneté*.

[168] La juge dissidente n'est pas de cet avis et conclut que l'interprétation qu'a faite la greffière de l'al. 3(2)a) était raisonnable. Selon la juge dissidente, le libellé de cette disposition permet au moins deux interprétations rationnelles : soit une interprétation incluant tous les employés au service d'un gouvernement étranger, soit une interprétation incluant

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dissenting judge's view, the former interpretation is not foreclosed by the context or the purpose of the provision. It was thus open to the Registrar to conclude that Mr. Vavilov's parents fell within the scope of s. 3(2)(a). The dissenting judge would have upheld the Registrar's decision.

C. *Analysis*

(1) Standard of Review

[169] Applying the standard of review analysis set out above leads to the conclusion that the standard to be applied in reviewing the merits of the Registrar's decision is reasonableness.

[170] When a court reviews the merits of an administrative decision, reasonableness is presumed to be the applicable standard of review, and there is no basis for departing from that presumption in this case. The Registrar's decision has come before the courts by way of judicial review, not by way of a statutory appeal. On this point, we note that ss. 22.1 through 22.4 of the *Citizenship Act* lay down rules that govern applications for judicial review of decisions made under that Act, one of which, in s. 22.1(1), is that such an application may be made only with leave of the Federal Court. However, none of these provisions allow for a party to bring an appeal from a decision under the *Citizenship Act*. Given this fact, and given that Parliament has not prescribed the standard to be applied on judicial review of the decision at issue, there is no indication that the legislature intended a standard of review other than reasonableness to apply. The Registrar's decision does not give rise to any constitutional questions, general questions of law of central importance to the legal system as a whole or questions regarding the jurisdictional boundaries between two or more administrative bodies. As a result, the standard to be applied in reviewing the decision is reasonableness.

seulement les employés au service d'un gouvernement étranger à qui on a accordé des privilèges et immunités diplomatiques. Selon la juge dissidente, le contexte ou l'objet de la disposition n'appellent pas forcément la première interprétation. Il était donc loisible à la greffière de conclure que les parents de M. Vavilov étaient visés par l'al. 3(2)a). La juge dissidente aurait maintenu la décision de la greffière.

C. *Analyse*

(1) La norme de contrôle applicable

[169] L'analyse visant à déterminer la norme de contrôle applicable présentée ci-dessus mène à la conclusion que le fond de la décision de la greffière doit être examiné selon la norme de la décision raisonnable.

[170] Lorsqu'une cour de justice contrôle une décision administrative au fond, la norme de contrôle applicable est présumée être celle de la décision raisonnable. Rien ne permet de s'écarter de cette présomption en l'espèce. La décision de la greffière a été soumise aux cours de justice par voie de contrôle judiciaire et non par voie d'appel en application de la loi. Signalons à cet effet que les art. 22.1 à 22.4 de la *Loi sur la citoyenneté* prescrivent des règles qui régissent les demandes de contrôle judiciaire des décisions rendues en vertu de cette loi. Par exemple, le par. 22.1(1) prévoit que toute demande de contrôle judiciaire de ce type de décisions est subordonnée à l'autorisation de la Cour fédérale. Toutefois, aucune de ces dispositions ne permet à une partie d'interjeter appel d'une décision rendue en vertu de la *Loi sur la citoyenneté*. Compte tenu de ce fait, et étant donné que le Parlement n'a pas prescrit la norme à appliquer dans le cas du contrôle judiciaire de la décision en litige, rien n'indique que le législateur voulait qu'une autre norme que celle de la décision raisonnable soit appliquée. La décision de la greffière ne soulève pas de questions constitutionnelles, de questions de droit générales d'importance capitale pour le système juridique dans son ensemble ou de questions liées aux délimitations des compétences respectives d'organismes administratifs. En conséquence, elle doit être examinée selon la norme de la décision raisonnable.

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(2) Review for Reasonableness

[171] The principal issue before this Court is whether it was reasonable for the Registrar to find that Mr. Vavilov's parents had been "other representative[s] or employee[s] in Canada of a foreign government" within the meaning of s. 3(2)(a) of the *Citizenship Act*.

[172] In our view, it was not. The Registrar failed to justify her interpretation of s. 3(2)(a) of the *Citizenship Act* in light of the constraints imposed by the text of s. 3 of the *Citizenship Act* considered as a whole, by other legislation and international treaties that inform the purpose of s. 3, by the jurisprudence on the interpretation of s. 3(2)(a), and by the potential consequences of her interpretation. Each of these elements — viewed individually and cumulatively — strongly supports the conclusion that s. 3(2)(a) was not intended to apply to children of foreign government representatives or employees who have not been granted diplomatic privileges and immunities. Though Mr. Vavilov raised many of these considerations in his submissions in response to the procedural fairness letter, the Registrar failed to address those submissions in her reasons and did not, to justify her interpretation of s. 3(2)(a), do more than conduct a cursory review of the legislative history and conclude that her interpretation was not explicitly precluded by the text of s. 3(2)(a).

[173] Our review of the Registrar's decision leads us to conclude that it was unreasonable for her to find that the phrase "diplomatic or consular officer or other representative or employee in Canada of a foreign government" applies to individuals who have not been granted diplomatic privileges and immunities in Canada. It is undisputed that Mr. Vavilov's parents had not been granted such privileges and immunities. No purpose would therefore be served by remitting this matter to the Registrar.

(a) *Section 3(2) of the Citizenship Act*

[174] The analyst justified her conclusion that Mr. Vavilov is not a citizen of Canada by reasoning

(2) L'examen du caractère raisonnable

[171] La principale question soumise à la Cour est de savoir s'il était raisonnable pour la greffière de conclure que les parents de M. Vavilov étaient des « représentant[s] à un autre titre ou au service au Canada d'un gouvernement étranger » au sens de l'al. 3(2)a) de la *Loi sur la citoyenneté*.

[172] À notre avis, il n'était pas raisonnable que la greffière tire cette conclusion. En effet, la greffière n'a pas justifié son interprétation de l'al. 3(2)a) de la *Loi sur la citoyenneté* à la lumière des contraintes qu'impose le libellé de l'art. 3 de la *Loi sur la citoyenneté* pris dans son ensemble, d'autres lois et traités internationaux qui éclairent l'objet de cette disposition, de la jurisprudence relative à l'interprétation de l'al. 3(2)a), et des conséquences possibles de son interprétation. Ces différents éléments — pris individuellement ainsi que dans leur ensemble — appuient fortement la conclusion selon laquelle l'al. 3(2)a) n'est pas censé s'appliquer aux enfants de représentants ou d'employés au service d'un gouvernement étranger à qui on n'avait pas accordé de privilèges et d'immunités diplomatiques. Bien que M. Vavilov ait soulevé bon nombre de ces considérations en réponse à la lettre dite d'équité procédurale, la greffière n'a pas traité de ces arguments dans ses motifs et n'a pas, pour justifier son interprétation de l'al. 3(2)a), fait davantage que se livrer à un examen superficiel de l'historique législatif et conclure que le libellé de l'al. 3(2)a) n'excluait pas explicitement son interprétation.

[173] Notre examen de la décision de la greffière mène à la conclusion qu'il était déraisonnable de sa part de décider que les mots « agent diplomatique ou consulaire, représentant à un autre titre ou au service au Canada d'un gouvernement étranger » visent les individus à qui on n'a pas accordé de privilèges et d'immunités diplomatiques au Canada. Il est acquis aux débats que les parents de M. Vavilov ne s'étaient pas vu accorder pareils privilèges et immunités. En conséquence, il ne servirait à rien de renvoyer l'affaire à la greffière.

a) *Le paragraphe 3(2) de la Loi sur la citoyenneté*

[174] L'analyste fonde sa conclusion selon laquelle M. Vavilov n'a pas qualité de citoyen canadien en

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that his parents were "other representative[s] or employee[s] in Canada of a foreign government" within the meaning of s. 3(2)(a) of the *Citizenship Act*. Section 3(2)(a) provides that children of "a diplomatic or consular officer or other representative or employee in Canada of a foreign government" are exempt from the general rule in s. 3(1)(a) that individuals born in Canada after February 14, 1977 acquire Canadian citizenship by birth. The analyst observed that although the term "diplomatic or consular officer" is defined in the *Interpretation Act* and does not apply to individuals like Mr. Vavilov's parents, the phrase "other representative or employee in Canada of a foreign government" is not so defined, and may apply to them.

faisant valoir que les parents de ce dernier étaient des « agent[s] diplomatique[s] ou consulaire[s], représentant[s] à un autre titre ou au service au Canada d'un gouvernement étranger » au sens de l'al. 3(2)a) de la *Loi sur la citoyenneté*. Suivant cette disposition, les enfants d'un « agent diplomatique ou consulaire, représentant à un autre titre ou au service au Canada d'un gouvernement étranger » sont exemptés de l'application de la règle générale énoncée à l'al. 3(1)a), selon laquelle les personnes nées au Canada après le 14 février 1977 ont la citoyenneté canadienne de naissance. L'analyste fait également remarquer que, contrairement au terme « agent diplomatique ou consulaire » qui est défini dans la *Loi d'interprétation* et ne s'applique pas aux personnes telles que les parents de M. Vavilov, l'expression « représentant à un autre titre ou au service au Canada d'un gouvernement étranger » n'est définie nulle part dans la législation et s'applique potentiellement à eux.

[175] The analyst's attempt to give the words "other representative or employee in Canada of a foreign government" a meaning distinct from that of "diplomatic or consular officer" is sensible. It is generally consistent with the principle of statutory interpretation that Parliament intends each word in a statute to have meaning: Sullivan, at p. 211. We accept that if the phrase "other representative or employee in Canada of a foreign government" were considered in isolation, it could apply to a spy working in the service of a foreign government in Canada. However, the analyst failed to address the immediate statutory context of s. 3(2)(a), including the closely related text in s. 3(2)(c):

[175] La tentative de l'analyste de donner des sens différents à l'expression « représentant à un autre titre ou au service au Canada d'un gouvernement étranger » et au terme « agent diplomatique ou consulaire » est sensée. Elle cadre généralement avec le principe d'interprétation législative selon lequel le législateur souhaite que chaque mot employé dans une loi ait un sens : Sullivan, p. 211. Nous reconnaissons que si l'expression « représentant à un autre titre ou au service au Canada d'un gouvernement étranger » était considérée isolément, elle pourrait viser un espion au service d'un gouvernement étranger qui est en mission au Canada. Cependant, l'analyste n'a pas examiné le contexte législatif qui entoure l'al. 3(2)a), notamment le libellé de l'al. 3(2)c) qui y est étroitement lié :

(2) Paragraph (1)(a) does not apply to a person if, at the time of his birth, neither of his parents was a citizen or lawfully admitted to Canada for permanent residence and either of his parents was

(a) a diplomatic or consular officer or other representative or employee in Canada of a foreign government;

(b) an employee in the service of a person referred to in paragraph (a); or

(2) L'alinéa (1)a) ne s'applique pas à la personne dont, au moment de la naissance, les parents n'avaient qualité ni de citoyens ni de résidents permanents et dont le père ou la mère était :

a) agent diplomatique ou consulaire, représentant à un autre titre ou au service au Canada d'un gouvernement étranger;

b) au service d'une personne mentionnée à l'alinéa a);

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(c) an officer or employee in Canada of a specialized agency of the United Nations or an officer or employee in Canada of any other international organization to whom there are granted, by or under any Act of Parliament, diplomatic privileges and immunities certified by the Minister of Foreign Affairs to be equivalent to those granted to a person or persons referred to in paragraph (a).

[176] As the majority of the Court of Appeal noted (at paras. 61-62), the wording of s. 3(2)(c) provides clear support for the conclusion that *all* of the persons contemplated by s. 3(2)(a) — including those who are "employee[s] in Canada of a foreign government" — must have been granted diplomatic privileges and immunities in some form. If, as the Registrar concluded, s. 3(2)(a) includes persons who do not benefit from these privileges or immunities, it is difficult to understand how effect could be given to the explicit equivalency requirement articulated in s. 3(2)(c). However, the analyst did not account for this tension in the immediate statutory context of s. 3(2)(a).

(b) *The Foreign Missions and International Organizations Act and the Treaties It Implements*

[177] Before the Registrar, Mr. Vavilov argued that s. 3(2) of the *Citizenship Act* must be read in conjunction with both the *Foreign Missions and International Organizations Act*, S.C. 1991, c. 41 ("*FMIOA*"), and the *Vienna Convention on Diplomatic Relations*, Can. T.S. 1966 No. 29 ("*VCDR*"). The *VCDR* and the *Vienna Convention on Consular Relations*, Can. T.S. 1974 No. 25, are the two leading treaties that extend diplomatic and/or consular privileges and immunities to employees and representatives of foreign governments in diplomatic missions and consular posts. Parliament has implemented the relevant provisions of both conventions by means of s. 3(1) of the *FMIOA*.

[178] To begin, we note that Canada affords citizenship in accordance both with the principle of

c) fonctionnaire ou au service, au Canada, d'une organisation internationale — notamment d'une institution spécialisée des Nations Unies — bénéficiant sous le régime d'une loi fédérale de privilèges et immunités diplomatiques que le ministre des Affaires étrangères certifie être équivalents à ceux dont jouissent les personnes visées à l'alinéa a).

[176] Comme l'ont fait remarquer les juges majoritaires de la Cour d'appel (par. 61-62), le libellé de l'al. 3(2)c) étaye clairement la conclusion selon laquelle *toutes* les personnes visées par l'al. 3(2)a) — y compris celles qui sont « au service au Canada d'un gouvernement étranger » — doivent s'être vu accorder certains privilèges et immunités diplomatiques. Si, comme l'a conclu la greffière, l'al. 3(2)a) vise les personnes qui ne bénéficient pas de tels privilèges ou immunités, il est difficile de comprendre comment l'on pourrait donner effet à l'exigence d'équivalence énoncée explicitement à l'al. 3(2)c). Or, l'analyste ne tient pas compte de cette tension dans le contexte législatif qui entoure l'al. 3(2)a).

b) *La Loi sur les missions étrangères et les organisations internationales et les traités qu'elle met en œuvre*

[177] Monsieur Vavilov a soutenu devant la greffière qu'il faut interpréter le par. 3(2) de la *Loi sur la citoyenneté* de concert avec la *Loi sur les missions étrangères et les organisations internationales*, L.C. 1991, c. 41 (« *LMEOI* »), et la *Convention de Vienne sur les relations diplomatiques*, R.T. Can. 1966 nº 29 (« *CVRD* »). La *CVRD* ainsi que la *Convention de Vienne sur les relations consulaires*, R.T. Can. 1974 nº 25, sont deux traités d'importance en vertu desquels les employés et représentants au service d'un gouvernement étranger affectés à des missions diplomatiques ou à des postes consulaires bénéficient de privilèges et immunités diplomatiques et consulaires. Le Parlement a mis en œuvre les dispositions pertinentes de ces deux conventions en les intégrant au par. 3(1) de la *LMEOI*.

[178] Tout d'abord, nous constatons que le Canada accorde la citoyenneté en suivant à la fois le principe

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jus soli, the acquisition of citizenship through birth regardless of the parents' nationality, and with that of *jus sanguinis*, the acquisition of citizenship by descent, that is through a parent: *Citizenship Act*, s. 3(1)(a) and (b); see I. Brownlie, *Principles of Public International Law* (5th ed. 1998), at pp. 391-93. These two principles operate as a backdrop to s. 3 of the *Citizenship Act* as a whole. It is undisputed that s. 3(2)(a) operates as an exception to these general rules. However, Mr. Vavilov took a narrower view of that exception than did the Registrar. In his submissions to the Registrar, he argued that Parliament intended s. 3(2) of the *Citizenship Act* to simply mirror the *FMIOA* and the *VCDR*, as well as Article II of the *Optional Protocol to the Vienna Convention on Diplomatic Relations, concerning Acquisition of Nationality*, 500 U.N.T.S. 223, which provides that "[m]embers of the mission not being nationals of the receiving State, and members of their families forming part of their household, shall not, solely by the operation of the law of the receiving State, acquire the nationality of that State". Mr. Vavilov made the following submission to the Registrar:

The purpose in excluding diplomats and their families, including newborn children, from acquiring citizenship in the receiving state relates to the immunities which extend to this group of people. Diplomats and their family members are immune from criminal prosecution and civil liability in the receiving state. As such, they cannot acquire citizenship in the receiving state and also benefit from these immunities. A citizen has duties and responsibilities to its country. Immunity is inconsistent with this principle and so does not apply to citizens. See Article 37 of the *Convention*.

Section 3(2) legislates into Canadian domestic law the above principles and should be narrowly interpreted with these purposes in mind. The term "employee in Canada of a foreign government" must be interpreted to mean an employee of a diplomatic mission, or connected to it, who benefits from the immunities of the *Convention*. Any other interpretation would lead to absurd results. There is no purpose served in excluding any child born of a

du *jus soli*, en vertu duquel la citoyenneté est acquise à la naissance peu importe la nationalité des parents, et le principe du *jus sanguinis*, en vertu duquel la citoyenneté est acquise par filiation, habituellement par l'entremise d'un parent : *Loi sur la citoyenneté*, al. 3(1)a) et b); voir I. Brownlie, *Principles of Public International Law* (5e éd. 1998), p. 391-393. Ces deux principes servent de toile de fond à l'art. 3 de la *Loi sur la citoyenneté* dans son ensemble. Il n'est pas contesté que l'al. 3(2)a) constitue une exception à ces règles générales. Cependant, M. Vavilov a interprété cette exception de façon plus restrictive que la greffière. Dans ses observations adressées à la greffière, il a soutenu que l'intention du Parlement était que le par. 3(2) de la *Loi sur la citoyenneté* reflète simplement les dispositions de la *LMEOI* et de la *CVRD*, de même que l'art. II du *Protocole de signature facultative à la Convention de Vienne sur les relations diplomatiques, concernant l'acquisition de la nationalité*, 500 R.T.N.U. 223, qui énonce ce qui suit : « [l]es membres de la mission qui n'ont pas la nationalité de l'État accréditaire et les membres de leur famille qui font partie de leur ménage n'acquièrent pas la nationalité de cet État par le seul effet de sa législation ». Monsieur Vavilov a fait valoir les arguments suivants à la greffière :

[TRADUCTION] L'exclusion des diplomates et de leur famille, y compris les nouveau-nés, du droit d'obtenir la citoyenneté de l'État accréditaire est liée aux immunités dont bénéficie ce groupe de personnes. Les diplomates et les membres de leur famille jouissent d'une immunité contre les poursuites criminelles et la responsabilité civile dans l'État accréditaire. Par conséquent, ils ne peuvent pas obtenir la citoyenneté de l'État accréditaire et bénéficier également de ces immunités. De fait, un citoyen a des obligations et des responsabilités envers son pays. L'immunité est inconciliable avec ce principe et ne s'applique donc pas aux citoyens. Voir l'article 37 de la *Convention*.

Le paragraphe 3(2) transpose en droit interne canadien les principes susmentionnés et devrait être interprété de façon restrictive en gardant ces objectifs à l'esprit. L'expression « au service au Canada d'un gouvernement étranger » doit être interprétée comme désignant un employé affecté à une mission diplomatique, ou ayant des liens avec une telle mission, qui bénéficie des immunités prévues dans la *Convention*. Toute autre interprétation donnerait des

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person not having a connection to a diplomatic mission in Canada while sojourning here from the principle of *Jus soli*.

(A.R., vol. IV, at pp. 449-50)

[179] In *Al-Ghamdi v. Canada (Minister of Foreign Affairs and International Trade)*, 2007 FC 559, 64 Imm. L.R. (3d) 67, a case which was referred to in the analyst's report and which we will discuss in greater detail below, the Federal Court, at para. 53, quoted a passage by Professor Brownlie on this point:

. . . Of particular interest are the special rules relating to the *jus soli*, appearing as exceptions to that principle, the effect of the exceptions being to remove the cases where its application is clearly unjustifiable. A rule which has very considerable authority stipulated that children born to persons having diplomatic immunity shall not be nationals by birth of the state to which the diplomatic agent concerned is accredited. Thirteen governments stated the exception in the preliminaries of the Hague Codification Conference. In a comment on the relevant article of the Harvard draft on diplomatic privileges and immunities it is stated: 'This article is believed to be declaratory of an established rule of international law'. The rule receives ample support from legislation of states and expert opinion. The Convention on Certain Questions relating to the Conflict of Nationality Laws of 1930 provides in Article 12: 'Rules of law which confer nationality by reason of birth on the territory of a State shall not apply automatically to children born to persons enjoying diplomatic immunities in the country where the birth occurs.'

In 1961 the United Nations Conference on Diplomatic Intercourse and Immunities adopted an Optional Protocol concerning Acquisition of Nationality, which provided in Article II: 'Members of the mission not being nationals of the receiving State, and members of their families forming part of their household, shall not, solely by the operation of the law of the receiving State, acquire the nationality of that State'. Some states extend the rule to the children of consuls, and there is some support for this from expert opinion. [Footnotes omitted.]

(Brownlie, at pp. 392-93)

résultats absurdes. Il ne sert à rien d'exclure de l'application du principe du *jus soli* les enfants dont les parents n'étaient pas attachés à une mission diplomatique au Canada pendant leur séjour au pays.

(d.a., vol. IV, p. 449-450)

[179] Dans l'affaire *Al-Ghamdi c. Canada (Ministre des Affaires étrangères et du Commerce international)*, 2007 CF 559, un jugement dont il est question dans le rapport de l'analyste et dont nous traitons plus en détail ultérieurement, la Cour fédérale cite au par. 53 (CanLII) un passage de l'ouvrage du professeur Brownlie sur ce point :

[TRADUCTION] . . . Les règles spéciales régissant le droit du sol (*jus soli*) présentent un intérêt particulier. Elles constituent une exception au principe général et ont pour effet de supprimer les cas où l'application de celui-ci est de toute évidence injustifiable. Ainsi, un principe jouissant d'une autorité considérable voulait que les enfants nés de parents bénéficiant de l'immunité diplomatique ne pouvaient être considérés de naissance comme des ressortissants de l'État auprès duquel l'agent diplomatique concerné était accrédité. Treize États se sont prévalus de cette exception lors des travaux préliminaires de la Conférence de La Haye pour la codification du droit international. Un commentateur faisait observer ce qui suit au sujet de l'article pertinent sur les privilèges et immunités diplomatiques : « Cet article est censé consacrer un principe établi de droit international ». Ce principe bénéficie d'un large appui de la part des législateurs des divers pays et des experts. La Convention de 1930 concernant certaines questions relatives aux conflits de lois sur la nationalité prévoit à son article 12 : « Les dispositions légales relatives à l'attribution de la nationalité d'un État en raison de la naissance sur son territoire ne s'appliquent pas de plein droit aux enfants dont les parents jouissent des immunités diplomatiques dans le pays de la naissance ».

En 1961, la Conférence des Nations Unies sur les relations et immunités diplomatiques a adopté un Protocole facultatif concernant l'acquisition de la nationalité, qui prévoit, à son article II : « Les membres de la mission qui n'ont pas la nationalité de l'État accréditaire et les membres de leur famille qui font partie de leur ménage n'acquièrent pas la nationalité de cet État par le seul effet de sa législation ». Certains États étendent la portée de cette règle aux enfants des consuls, et certains experts appuient cette façon de procéder. [Notes en bas de page omises.]

(Brownlie, p. 392-393)

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[180] Mr. Vavilov included relevant excerpts from the parliamentary debate that had preceded the enactment of the *Citizenship Act* in support of his argument that the very purpose of s. 3(2) of the *Citizenship Act* was to align Canada's citizenship rules with these principles of international law. These excerpts describe s. 3(2) as "conform[ing] to international custom" and as having been drafted with the intention of "exclud[ing] children born in Canada to diplomats from becoming Canadian citizens": Hon. J. Hugh Faulkner, Secretary of State of Canada, House of Commons, *Minutes of Proceedings and Evidence of the Standing Committee on Broadcasting, Films and Assistance to the Arts, Respecting Bill C-20, An Act respecting citizenship*, No. 34, 1st Sess., 30th Parl., February 24, 1976, at p. 34:23. The record of that debate also reveals that Parliament took care to avoid the danger that because of how some provisions were written, "a number of other people would be affected such as those working for large foreign corporations": *ibid*. Although the analyst discussed the textual difference between s. 3(2) and a similar provision in the former *Canadian Citizenship Act*, she did not grapple with these other elements of the legislative history, despite the fact that they cast considerable doubt on her conclusions, indicating that s. 3(2) was not intended to affect the status of individuals whose parents have not been granted diplomatic privileges and immunities.

[181] In attempting to distinguish the meaning of the phrase "other representative or employee in Canada of a foreign government" from that of the term "diplomatic or consular officer", the analyst also appeared to overlook the possibility that some individuals who fall into the former category might be granted privileges or immunities despite not being considered "diplomatic or consular officer[s]" under the *Interpretation Act*. Yet, as the majority of the Federal Court of Appeal pointed out, such individuals do in fact exist: paras. 53-55, citing *FMIOA*, at ss. 3 and 4 and Sched. II, Articles 1, 41, 43, 49, and 53. In light of Mr. Vavilov's submissions regarding the purpose of s. 3(2), the failure to consider this possibility is a noticeable omission.

[180] Monsieur Vavilov a joint des extraits pertinents des débats parlementaires qui avaient précédé l'adoption de la *Loi sur la citoyenneté* en vue d'appuyer son argument selon lequel le par. 3(2) de la *Loi sur la citoyenneté* vise précisément à harmoniser les règles du Canada en matière de citoyenneté avec ces principes de droit international. Dans ces extraits, il est mentionné que le par. 3(2) « suit l'usage international » et qu'il a été rédigé avec l'intention d'« empêche[r] les enfants nés au Canada de diplomates étrangers de devenir citoyens canadiens » : l'honorable J. Hugh Faulkner, Secrétaire d'État du Canada, Chambre des communes, *Procès-verbaux et témoignages du Comité permanent de la Radiodiffusion, des films et de l'assistance aux arts, concernant Bill C-20, Loi concernant la citoyenneté*, nº 34, 1re sess., 30e lég., 24 février 1976, p. 34:23. Le procès-verbal de ce débat révèle également que le Parlement a pris soin d'éviter qu'il y ait un « risque, en rédigeant quelque stipulation [. . .], de toucher d'autres gens, [à] savoir notamment ceux qui œuvrent pour le compte d'importantes sociétés étrangères » : *ibid.*, p. 34:23 et 34:24. Bien que l'analyste ait traité des différences entre le libellé du par. 3(2) et celui d'une disposition semblable de l'ancienne *Loi sur la citoyenneté canadienne*, elle n'a pas abordé ces autres éléments de l'historique législatif de ce paragraphe, et ce, même si ceux-ci mettent grandement en doute ses conclusions et indiquent que le par. 3(2) n'était pas censé modifier le statut des personnes dont les parents ne se sont pas vu accorder de privilèges et immunités diplomatiques.

[181] En tentant de faire une distinction entre le sens de l'expression « représentant à un autre titre ou au service au Canada d'un gouvernement étranger » et celui du terme « agent diplomatique ou consulaire », l'analyste semble aussi ne pas avoir envisagé la possibilité que certaines personnes qui font partie de la première catégorie se voient accorder des privilèges ou immunités sans pour autant être des « agent[s] diplomatique[s] ou consulaire[s] » au sens de la *Loi d'interprétation*. Or, comme le soulignent les juges majoritaires de la Cour d'appel fédérale, ces personnes existent bel et bien : par. 53-55, citant la *LMEOI*, art. 3 et 4 et ann. II, articles 1, 41, 43, 49 et 53. Vu les observations de M. Vavilov concernant l'objet du par. 3(2), le défaut d'envisager cette possibilité constitue une omission évidente.

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[182] It is well established that domestic legislation is presumed to comply with Canada's international obligations, and that it must be interpreted in a manner that reflects the principles of customary and conventional international law: *Appulonappa*, at para. 40; see also *Pushpanathan*, at para. 51; *Baker*, at para. 70; *GreCon Dimter inc. v. J.R. Normand inc.*, 2005 SCC 46, [2005] 2 S.C.R. 401, at para. 39; *Hape*, at paras. 53-54; *B010 v. Canada (Citizenship and Immigration)*, 2015 SCC 58, [2015] 3 S.C.R. 704, at para. 48; *India v. Badesha*, 2017 SCC 44, [2017] 2 S.C.R. 127, at para. 38; *Office of the Children's Lawyer v. Balev*, 2018 SCC 16, [2018] 1 S.C.R. 398, at paras. 31-32. Yet the analyst did not refer to the relevant international law, did not inquire into Parliament's purpose in enacting s. 3(2) and did not respond to Mr. Vavilov's submissions on this issue. Nor did she advance any alternate explanation for why Parliament would craft such a provision in the first place. In the face of compelling submissions that the underlying rationale of s. 3(2) was to implement a narrow exception to a general rule in a manner that was consistent with established principles of international law, the analyst and the Registrar chose a different interpretation without offering any reasoned explanation for doing so.

(c) *Jurisprudence Interpreting Section 3(2) of the Citizenship Act*

[183] Although the analyst cited three Federal Court decisions on s. 3(2)(a) of the *Citizenship Act* in a footnote, she dismissed them as being irrelevant on the basis that they related only to "individuals whose parents maintained diplomatic status in Canada at the time of their birth": A.R., vol. I, at p. 7. But this distinction, while true, does not explain why the *reasoning* employed in those decisions, which directly concerned the scope, the meaning and the legislative purpose of s. 3(2)(a), was inapplicable in Mr. Vavilov's case. Had the analyst considered just the three cases cited in her report — *Al-Ghamdi*; *Lee v. Canada (Minister of Citizenship and Immigration)*, 2008 FC 614, [2009] 1 F.C.R. 204; and *Hitti v. Canada (Minister of Citizenship and Immigration)*, 2007 FC 294, 310 F.T.R. 168 — it would have been evident to her that she needed to grapple with and justify her interpretation in light of the persuasive

[182] Il est bien établi que la loi interne est présumée respecter les obligations internationales du Canada et qu'elle doit être interprétée d'une manière qui reflète les principes du droit international coutumier et conventionnel : *Appulonappa*, par. 40; voir aussi *Pushpanathan*, par. 51; *Baker*, par. 70; *GreCon Dimter inc. c. J.R. Normand inc.*, 2005 CSC 46, [2005] 2 R.C.S. 401, par. 39; *Hape*, par. 53-54; *B010 c. Canada (Citoyenneté et Immigration)*, 2015 CSC 58, [2015] 3 R.C.S. 704, par. 48; *Inde c. Badesha*, 2017 CSC 44, [2017] 2 R.C.S. 127, par. 38; *Bureau de l'avocat des enfants c. Balev*, 2018 CSC 16, [2018] 1 R.C.S. 398, par. 31-32. Néanmoins, l'analyste ne fait pas état des règles de droit international pertinentes, ne s'interroge pas sur l'objectif que le législateur visait en adoptant le par. 3(2), et ne répond pas aux observations que M. Vavilov a présentées à cet égard. L'analyste n'essaie pas non plus d'expliquer autrement pourquoi le législateur élaborerait au départ une disposition de cette nature. Malgré les observations convaincantes voulant que la raison d'être du par. 3(2) consiste à instituer une exception étroite à la règle générale, conformément aux principes établis du droit international, l'analyste et la greffière ont choisi une interprétation différente, sans motiver leur choix de façon raisonnée.

c) *La jurisprudence relative à l'interprétation du par. 3(2) de la Loi sur la citoyenneté*

[183] Dans une note en bas de page, l'analyste cite trois jugements de la Cour fédérale portant sur l'al. 3(2)a) de la *Loi sur la citoyenneté*, mais les juge dépourvus de pertinence au motif qu'ils concernent des [TRADUCTION] « personnes dont les parents jouissaient du statut diplomatique au Canada au moment de leur naissance » : d.a., vol. I, p. 7. Bien que ce soit exact, cette distinction ne permet pas d'expliquer l'inapplicabilité, dans le cas de M. Vavilov, du *raisonnement* adopté dans ces jugements et qui porte directement sur la portée, la signification et l'objectif législatif de l'al. 3(2)a). Si l'analyste s'était attardée ne serait-ce qu'aux trois jugements cités dans son rapport — *Al-Ghamdi*; *Lee c. Canada (Ministre de la Citoyenneté et de l'Immigration)*, 2008 CF 614, [2009] 1 R.C.F. 204; et *Hitti c. Canada (Ministre de la Citoyenneté et de l'Immigration)*, 2007 CF 294 — il aurait été évident à ses yeux qu'elle devait confronter

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and comprehensive legal reasoning that supports the position that s. 3(2)(a) was intended to apply only to those individuals whose parents have been granted diplomatic privileges and immunities.

[184] In *Al-Ghamdi*, the Federal Court considered the constitutionality of paras. (a) and (c) of s. 3(2) of the *Citizenship Act* in reviewing a decision in which Passport Canada had refused to issue a passport to a child of a Saudi Arabian diplomat. In its reasons, the court came to a number of conclusions regarding the purpose and scope of s. 3(2), including, at para. 5, that

> [t]he only individuals covered in paragraphs 3(2)(a) and (c) of the *Citizenship Act* are children of individuals with diplomatic status. These are individuals who enter Canada under special circumstances and without undergoing any of the normal procedures. Most importantly, while in Canada, they are granted all of the immunities and privileges of diplomats . . . .

[185] The court went on to extensively document the link between the exception to the rule of citizenship by birth set out in s. 3(2) of the *Citizenship Act* and the rules of international law, the *FMIOA* and the *VCDR*: *Al-Ghamdi*, at paras. 52 et seq. It noted that there is an established rule of international law that children born to parents who enjoy diplomatic immunities are not entitled to automatic citizenship by birth, and that their status in this respect is an exception to the principle of *jus soli*: *Al-Ghamdi*, at para. 53, quoting Brownlie, at pp. 391-93. In finding that the exceptions under s. 3(2) to citizenship on the basis of *jus soli* do not infringe the rights of children of diplomats under s. 15 of the *Charter*, the court emphasized that *all* children to whom s. 3(2) applies are entitled to an "extraordinary array of privileges under the *Foreign Missions and International Organizations Act*": *Al-Ghamdi*, at para. 62. Citing the *VCDR*, it added that "[i]t is precisely because of the vast array of privileges accorded to diplomats and their families, which are by their very nature inconsistent with the obligations of citizenship, that a person who enjoys diplomatic status cannot acquire citizenship": para. 63. In its analysis under s. 1 of

sa propre interprétation et la justifier eu égard au raisonnement juridique convaincant et détaillé à l'appui de la thèse voulant que l'al. 3(2)a) ne soit censé s'appliquer qu'aux personnes dont les parents se sont vu accorder des privilèges et immunités diplomatiques.

[184] Dans l'affaire *Al-Ghamdi*, la Cour fédérale s'est penchée sur la constitutionnalité des al. 3(2)a) et c) de la *Loi sur la citoyenneté* en contrôlant une décision par laquelle Passeport Canada avait refusé de délivrer un passeport à l'enfant d'un diplomate saoudien. Dans ses motifs, la cour est arrivée à plusieurs conclusions au sujet de l'objet et de la portée du par. 3(2), dont celle qui suit au par. 5 :

> Les seules personnes visées aux alinéas 3(2)a) et c) de la *Loi sur la citoyenneté* sont les enfants de personnes ayant le statut diplomatique. Il s'agit de personnes qui sont admises sur le territoire canadien dans des circonstances particulières et qui ne sont pas assujetties aux formalités habituelles. Mais surtout, pendant qu'elles se trouvent au Canada, elles bénéficient de toutes les immunités et de tous les privilèges reconnus aux diplomates . . .

[185] La cour a ensuite documenté en détail le lien entre l'exception à la règle de la citoyenneté par naissance énoncée au par. 3(2) de la *Loi sur la citoyenneté* et les règles de droit international, la *LMEOI* et la *CVRD* : *Al-Ghamdi*, par. 52 et suiv. Elle a fait remarquer qu'il est établi en droit international que les enfants nés de parents bénéficiant de l'immunité diplomatique n'acquièrent pas automatiquement la citoyenneté à la naissance, et que leur statut à cet égard constitue une exception au principe du *jus soli* : *Al-Ghamdi*, par. 53, citant Brownlie, p. 391-393. En concluant que les exceptions du par. 3(2) à la règle de la citoyenneté *jus soli* ne portent pas atteinte aux droits conférés aux enfants de diplomates par l'art. 15 de la *Charte*, la cour a souligné que *tous* les enfants auxquels s'applique le par. 3(2) bénéficient d'une « gamme extraordinaire de privilèges en vertu de la *Loi sur les missions étrangères et les organisations internationales* » : *Al-Ghamdi*, par. 62. Citant la *CVRD*, elle a ajouté que « [c]'est précisément en raison de la vaste gamme de privilèges dont jouissent les diplomates et leur famille, privilèges qui sont de par leur nature même incompatibles avec les obligations de la citoyenneté, qu'une personne qui jouit

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the *Charter*, the court found that the choice to deny citizenship to individuals provided for in s. 3(2) is "tightly connected" to a pressing government objective of ensuring "that no citizen is immune from the obligations of citizenship", such as the obligations to pay taxes and comply with the criminal law: *Al-Ghamdi*, at paras. 74-75. In the case at bar, the analyst failed entirely to engage with the arguments endorsed by the Federal Court in *Al-Ghamdi* despite the court's key finding that s. 3(2)(a) applies only to "children born of foreign diplomats or an equivalent", a conclusion upon which the very constitutionality of the provision turned: *Al-Ghamdi*, at paras. 3, 9, 27, 28, 56 and 59.

du statut diplomatique ne peut acquérir la citoyenneté » : par. 63. Dans son analyse conduite au regard de l'article premier de la *Charte*, la cour a conclu que le refus d'octroyer la citoyenneté aux personnes visées au par. 3(2) est « étroitement lié » à l'objectif urgent de l'État consistant à s'assurer « qu'aucun citoyen n'est dispensé des obligations afférentes à la citoyenneté », comme payer des impôts et respecter les lois criminelles : *Al-Ghamdi*, par. 74-75. En l'espèce, l'analyste n'a aucunement abordé les arguments retenus par la Cour fédérale dans l'affaire *Al-Ghamdi*, malgré la conclusion décisive de la cour portant que l'al. 3(2)a) s'appliquait uniquement aux « enfants nés de diplomates étrangers ou de l'équivalent », une conclusion au cœur de la constitutionnalité même de la disposition : *Al-Ghamdi*, par. 3, 9, 27, 28, 56 et 59.

[186] In *Lee*, another case cited by the analyst, the Federal Court confirmed the finding in *Al-Ghamdi* that "[t]he only individuals covered in paragraphs 3(2)(a) and (c) of the *Citizenship Act* are children of individuals with diplomatic status": *Lee*, at para. 77. The court found in *Lee* that the "functional duties of the applicant's father" were not relevant to whether or not the applicant was excluded from citizenship pursuant to s. 3(2)(a) of the *Citizenship Act*: para. 58. Rather, what mattered was only that at the time of the applicant's birth, his father had been a registered consular official and had held a diplomatic passport and the title of Vice-Consul: paras. 44, 58, 61 and 63.

[186] Dans l'affaire *Lee*, un autre jugement que cite l'analyste, la Cour fédérale a confirmé la conclusion de l'affaire *Al-Ghamdi* selon laquelle « [l]es seules personnes visées par les alinéas 3(2)a) et c) de la *Loi sur la citoyenneté* sont les enfants des personnes ayant le statut diplomatique » : *Lee*, par. 77. La cour a jugé dans *Lee* qu'il importait peu de connaître quelles « fonctions exerçait concrètement le père du demandeur » pour déterminer si le fils tombait ou non sous le coup de l'exclusion prévue à l'al. 3(2)a) de la *Loi sur la citoyenneté* : par. 58. Ce qui comptait au contraire, c'était que le père du demandeur était enregistré comme agent diplomatique au moment de la naissance de l'enfant et détenait un passeport diplomatique ainsi que le titre de vice-consul : par. 44, 58, 61 et 63.

[187] *Hitti*, the third case cited in the analyst's report, concerned a decision to confiscate two citizenship certificates on the basis that, under s. 3(2) of the *Citizenship Act*, their holders had never been entitled to them. In that case, the applicants' father, a Lebanese citizen, had been employed as an information officer of the League of Arab States in Ottawa. Although the League did not have diplomatic standing at that time, Canada had agreed as a matter of courtesy to extend diplomatic status to officials of the League's information centre, treating them as "attachés" of their home countries' embassies: *Hitti*, at paras. 6 and 9; see also *Interpretation*

[187] L'affaire *Hitti*, le troisième jugement invoqué dans le rapport de l'analyste, portait sur une décision de confisquer deux certificats de citoyenneté au motif que, suivant le par. 3(2) de la *Loi sur la citoyenneté*, leurs titulaires n'y avaient jamais eu droit. Dans cette affaire, le père des demandeurs, un citoyen libanais, avait travaillé comme agent d'information de la Ligue des États arabes à Ottawa. Puisque la Ligue ne jouissait d'aucun statut diplomatique à l'époque, le Canada a convenu, par courtoisie, de reconnaître aux agents du bureau d'information de la Ligue un statut diplomatique lié à leur État d'appartenance, à titre d'« attachés » de l'ambassade de leur pays respectif :

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Act, s. 35(1). Mr. Hitti argued he did not, in practice, fulfill diplomatic tasks or act as a representative of Lebanon, but there was nonetheless a record of his being an accredited diplomat, enjoying the benefits of that status and being covered by the *VCDR* when his children were born: paras. 5 and 8. The Federal Court rejected a submission that Mr. Hitti would have had to perform duties in the service of Lebanon in order for his children to fall within the meaning of s. 3(2)(a), and concluded that "what Mr. Hitti did when he was in the country is not relevant": para. 32.

[188] What can be seen from both *Lee* and *Hitti* is that what matters, for the purposes of s. 3(2)(a), is not whether an individual carries out activities in the service of a foreign state while in Canada, but whether, at the relevant time, the individual has been granted diplomatic privileges and immunities. Thus, in addition to the Federal Court's decision in *Al-Ghamdi*, the analyst was faced with two cases in which the application of s. 3(2) had turned on the existence of diplomatic status rather than on the "functional duties" or activities of the child's parents. In these circumstances, it was a significant omission for her to ignore the Federal Court's reasoning when determining whether the espionage activities of Ms. Vavilova and Mr. Bezrukov were sufficient to ground the application of s. 3(2)(a).

(d) *Possible Consequences of the Registrar's Interpretation*

[189] When asked why the children of individuals referred to in s. 3(2)(a) would be excluded from acquiring citizenship by birth, another analyst involved in Mr. Vavilov's file (who had also been involved in Mr. Vavilov's brother's file) responded as follows:

Well, usually the way we use section 3(2)(a) is for — you're right, for diplomats and that they don't — because

Hitti, par. 6 et 9 (CanLII); voir également la *Loi d'interprétation*, par. 35(1). Si M. Hitti avançait qu'en pratique, il n'avait pas rempli des tâches liées à la fonction de diplomate ni agi à titre de représentant de l'État libanais, il existait néanmoins un document révélant qu'il avait qualité de diplomate accrédité, qu'il bénéficiait du statut diplomatique et qu'il était assujetti à la *CVRD* durant la période au cours de laquelle étaient nés ses enfants : par. 5 et 8. La Cour fédérale a rejeté la prétention suivant laquelle M. Hitti aurait été tenu d'exercer des fonctions au service du Liban pour que ses enfants tombent sous le coup de l'al. 3(2)a), concluant qu'« il n'[était] pas pertinent de déterminer ce que faisait M. Hitti alors qu'il était au pays » : par. 32.

[188] Il ressort des affaires *Lee* et *Hitti* que, pour l'application de l'al. 3(2)a), ce qui compte n'est pas de savoir si une personne se livre à des activités au service d'un État étranger alors qu'elle se trouve au Canada. Il s'agit plutôt de déterminer si la personne s'était vu accorder, à l'époque pertinente, des privilèges et immunités diplomatiques. Ainsi, outre le jugement rendu par la Cour fédérale dans l'affaire *Al-Ghamdi*, l'analyste se devait d'examiner deux autres affaires où l'application du par. 3(2) dépendait de la présence du statut diplomatique plutôt que des « fonctions [qu'exerçaient] concrètement » les parents de l'enfant. Dans ces circonstances, il s'agissait d'une omission importante de la part de l'analyste que d'ignorer le raisonnement de la Cour fédérale au moment de décider si les activités d'espionnage qu'avaient exercées M^me^ Vavilova et M. Bezrukov étaient suffisantes pour permettre l'application de l'al. 3(2)a).

d) *Les conséquences possibles de l'interprétation donnée par la greffière*

[189] Lorsqu'on lui a demandé les raisons pour lesquelles les enfants des personnes mentionnées à l'al. 3(2)a) n'auraient pas qualité de citoyens canadiens par naissance, une autre analyste impliquée dans le dossier de M. Vavilov (qui était aussi impliquée dans le dossier de son frère) a répondu ceci :

[TRADUCTION] Eh bien, nous appliquons d'habitude l'alinéa 3(2)a) dans le cas — vous avez raison, dans le

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they are not — they are not obliged . . . to the law of Canada and everything, so that's why their children do not obtain citizenship if they were born in Canada while the person was in Canada under that status.

But then there is also this other part of the Act that says other representatives or employees of a foreign government in Canada, that may open the door for other person[s] than diplomats and that's how we interpreted in this specific case 3(2)(a) but there is no jurisprudence on that . . . .

(R.R., transcript, at pp. 87-88)

[190] In other words, the officials responsible for these files were aware that s. 3(2)(a) was informed by the principle that individuals subject to the exception are "not obliged . . . to the law of Canada". They were also aware that the interpretation they had adopted in the case of the Vavilov brothers was a novel one. Although the Registrar knew this, she failed to provide a rationale for this expanded interpretation.

[191] Additionally, there is no evidence that the Registrar considered the potential consequences of expanding her interpretation of s. 3(2)(a) to include individuals who have not been granted diplomatic privileges and immunities. Citizenship has been described as "the right to have rights": U.S. Supreme Court Chief Justice Earl Warren, as quoted in A. Brouwer, *Statelessness in Canadian Context: A Discussion Paper* (July 2003) (online), at p. 2. The importance of citizenship was recognized in *Benner v. Canada (Secretary of State)*, [1997] 1 S.C.R. 358, in which Iacobucci J., writing for this Court, stated: "I cannot imagine an interest more fundamental to full membership in Canadian society than Canadian citizenship": para. 68. This was reiterated in *Canada (Minister of Citizenship and Immigration) v. Tobiass*, [1997] 3 S.C.R. 391, in which this Court unanimously held that "[f]or some, such as those who might become stateless if deprived of their citizenship, it may be valued as highly as liberty": para. 108.

cas des diplomates et parce qu'ils — car ils ne sont pas — ils ne sont pas assujettis [. . .] aux lois canadiennes et à d'autres règles, alors c'est pourquoi leurs enfants n'obtiennent pas la citoyenneté au moment de leur naissance au Canada quand les parents s'y trouvaient et avaient ce statut.

Or, la disposition de la Loi porte aussi sur les représentants à un autre titre ou au service au Canada d'un gouvernement étranger, ce qui permet d'ajouter d'autres personnes aux diplomates et c'est la façon dont nous avons interprété l'alinéa 3(2)a) dans ce cas précis, mais il n'y a pas de jurisprudence qui porte sur cette question . . .

(d.i., transcription, p. 87-88)

[190] Autrement dit, les fonctionnaires chargées de ces dossiers savaient que l'al. 3(2)a) reposait sur le principe que les personnes faisant l'objet de l'exception ne sont « pas assujetti[e]s [. . .] aux lois canadiennes ». Elles étaient également au fait du caractère inédit de l'interprétation adoptée dans le cas des frères Vavilov. Même si la greffière avait connaissance des éléments susmentionnés, elle n'a pas motivé cette interprétation élargie.

[191] En outre, rien n'établit que la greffière a tenu compte des conséquences que peut avoir le fait d'étendre son interprétation de l'al. 3(2)a) aux personnes à qui on n'a pas accordé de privilèges et d'immunités diplomatiques. La citoyenneté a été qualifiée de [TRADUCTION] « droit d'avoir des droits » : le juge en chef de la Cour suprême des États-Unis, Earl Warren, cité dans A. Brouwer, *Statelessness in Canadian Context : A Discussion Paper* (juillet 2003) (en ligne), p. 2. L'importance de la citoyenneté a été reconnue dans l'arrêt *Benner c. Canada (Secrétaire d'État)*, [1997] 1 R.C.S. 358, où le juge Iacobucci, s'exprimant au nom de notre Cour, a affirmé : « Je ne puis imaginer d'intérêt plus fondamental que la citoyenneté canadienne pour quiconque veut être membre à part entière de la société canadienne » : par. 68. Cette position a été reprise dans l'arrêt *Canada (Ministre de la Citoyenneté et de l'Immigration) c. Tobiass*, [1997] 3 R.C.S. 391, où notre Cour a conclu à l'unanimité que « [p]our certains, comme ceux qui pourraient devenir apatrides s'ils étaient privés de leur citoyenneté, elle peut être aussi précieuse que la liberté » : par. 108.

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[192] It perhaps goes without saying that rules concerning citizenship require a high degree of interpretive consistency in order to shield against a perception of arbitrariness and to ensure conformity with Canada's international obligations. We can therefore only assume that the Registrar intended that this new interpretation of s. 3(2)(a) would apply to any other individual whose parent is employed by or represents a foreign government at the time of the individual's birth in Canada but has not been granted diplomatic privileges and immunities. The Registrar's interpretation would not, after all, limit the application of s. 3(2)(a) to the children of spies — its logic would be equally applicable to a number of other scenarios, including that of a child of a non-citizen worker employed by an embassy as a gardener or cook, or of a child of a business traveller who represents a foreign government-owned corporation. Mr. Vavilov had raised the fact that provisions such as s. 3(2)(a) must be given a narrow interpretation because they deny or potentially take away rights — that of citizenship under s. 3(1) in this case — which otherwise benefit from a liberal and broad interpretation: *Brossard (Town) v. Quebec (Commission des droits de la personne)*, [1988] 2 S.C.R. 279, at p. 307. Yet there is no indication that the Registrar considered the potential harsh consequences of her interpretation for such a large class of individuals, which included Mr. Vavilov, or the question whether, in light of those possible consequences, Parliament would have intended s. 3(2)(a) to apply in this manner.

[193] Moreover, we would note that despite following a different legal process, the Registrar's decision in this case had the same effect as a revocation of citizenship — a process which has been described by scholars as "a kind of 'political death'" — depriving Mr. Vavilov of his right to vote and the right to enter and remain in Canada: see A. Macklin, "Citizenship Revocation, the Privilege to Have Rights and the Production of the Alien" (2014), 40 *Queen's L.J.* 1, at pp. 7-8. While we question whether the Registrar was empowered to unilaterally alter Canada's position with respect to Mr. Vavilov's citizenship and

[192] Il va probablement sans dire que les règles concernant la citoyenneté commandent une grande uniformité en matière d'interprétation pour se prémunir contre la perception d'arbitraire et assurer le respect des obligations internationales du Canada. Nous ne pouvons donc que supposer que la greffière voulait que cette nouvelle interprétation de l'al. 3(2)a) s'applique à toute autre personne dont les parents, au moment de sa naissance au Canada, représentaient un gouvernement étranger ou étaient au service d'un gouvernement étranger, tout en ne s'étant pas vu accorder de privilèges et d'immunités diplomatiques. L'interprétation de la greffière ne saurait en fin de compte limiter l'application de l'al. 3(2)a) aux enfants d'espions; sa logique vaudrait tout autant dans plusieurs autres cas, dont ceux de l'enfant d'un travailleur non-citoyen au service d'une ambassade à titre de jardinier ou de cuisinier, ou de l'enfant de gens d'affaires qui représentent une personne morale appartenant à un gouvernement étranger. Monsieur Vavilov avait évoqué le besoin de donner aux dispositions telles que l'al. 3(2)a) une interprétation étroite puisqu'elles refusent ou risquent d'enlever des droits, en l'occurrence la citoyenneté acquise au titre du par. 3(1), qui autrement recevraient une interprétation large et libérale : *Brossard (Ville) c. Québec (Commission des droits de la personne)*, [1988] 2 R.C.S. 279, p. 307. Néanmoins, rien n'indique que la greffière a pris en compte les conséquences possiblement sévères de son interprétation pour une catégorie pourtant vaste de personnes, dont M. Vavilov. Rien n'indique non plus que, compte tenu de ces conséquences éventuelles, la greffière s'est demandé si le Parlement aurait voulu que l'al. 3(2)a) s'applique de cette manière.

[193] Nous tenons d'ailleurs à souligner que, malgré la voie judiciaire différente suivie, la décision de la greffière dans la présente affaire a eu le même effet qu'une révocation de la citoyenneté — processus que les universitaires ont assimilé à une [TRADUCTION] « forme de "mort politique" » — privant M. Vavilov de son droit de vote et de son droit d'entrer au Canada et d'y demeurer : voir A. Macklin, « Citizenship Revocation, the Privilege to Have Rights and the Production of the Alien » (2014), 40 *Queen's L.J.* 1, p. 7-8. Bien que la question se pose à savoir si la greffière avait le pouvoir de modifier unilatéralement la

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recognize that the relationship between the cancellation of a citizenship certificate under s. 26 of the *Citizenship Regulations* and the revocation of an individual's citizenship (as set out in s. 10 of the *Citizenship Act*) is not clear, we leave this issue for another day because it was neither raised nor argued by the parties.

D. *Conclusion*

[194] Multiple legal and factual constraints may bear on a given administrative decision, and these constraints may interact with one another. In some cases, a failure to justify the decision against any one relevant constraint may be sufficient to cause the reviewing court to lose confidence in the reasonableness of the decision. Section 3 of the *Citizenship Act* considered as a whole, other legislation and international treaties that inform the purpose of s. 3, the jurisprudence cited in the analyst's report, and the potential consequences of the Registrar's decision point overwhelmingly to the conclusion that Parliament did not intend s. 3(2)(a) to apply to children of individuals who have not been granted diplomatic privileges and immunities. The Registrar's failure to justify her decision with respect to these constraints renders her interpretation unreasonable, and we would therefore uphold the Federal Court of Appeal's decision to quash the Registrar's decision.

[195] As noted above, we would exercise our discretion not to remit the matter to the Registrar for redetermination. Crucial to our decision is the fact that Mr. Vavilov explicitly raised all of these issues before the Registrar and that the Registrar had an opportunity to consider them but failed to do so. She offered no justification for the interpretation she adopted except for a superficial reading of the provision in question and a comment on part of its legislative history. On the other hand, there is overwhelming support — including in the parliamentary debate, established principles of international law, an established line of jurisprudence and the text of the provision itself — for the conclusion that Parliament

position du Canada sur la citoyenneté de M. Vavilov, et tout en étant conscients que le lien entre l'annulation d'un certificat de citoyenneté en application de l'art. 26 du *Règlement sur la citoyenneté* et la révocation de la citoyenneté d'une personne (au titre de l'art. 10 de la *Loi sur la citoyenneté*) n'est pas clair, nous attendrons une autre occasion pour examiner cette question que les parties n'ont ni soulevée ni débattue.

D. *Conclusion*

[194] De multiples contraintes juridiques et factuelles peuvent influer sur une décision administrative donnée, et elles peuvent interagir les unes avec les autres. Parfois, l'omission de justifier la décision en regard d'une des contraintes pertinentes peut suffire à amener la cour de révision à perdre confiance dans le caractère raisonnable de la décision. L'article 3 de la *Loi sur la citoyenneté* pris dans son ensemble, les autres lois et traités internationaux qui éclairent l'objet de cette disposition, la jurisprudence citée dans le rapport de l'analyste et les conséquences possibles de la décision de la greffière mènent inéluctablement à la conclusion que le Parlement ne voulait pas que l'al. 3(2)a) s'applique aux enfants des personnes à qui on n'a pas accordé de privilèges et d'immunités diplomatiques. Le défaut de la greffière de justifier sa décision à l'égard de ces contraintes rend son interprétation déraisonnable. Nous sommes par conséquent d'avis de confirmer l'arrêt de la Cour d'appel fédérale qui a cassé la décision de la greffière.

[195] Tel que nous l'avons mentionné, nous sommes d'avis d'exercer notre pouvoir discrétionnaire de ne pas renvoyer l'affaire à la greffière pour qu'elle rende une nouvelle décision. Fait essentiel à nos yeux, M. Vavilov a soulevé explicitement toutes ces questions devant la greffière, et cette dernière a eu la possibilité d'en tenir compte mais elle ne l'a pas fait. Elle n'a justifié d'aucune manière l'interprétation qu'elle a retenue si ce n'est que pour procéder à un examen superficiel de la disposition en cause et de faire une remarque sur une partie de l'historique législatif de la disposition. En revanche, un très grand nombre de sources — notamment le débat parlementaire, des principes reconnus de droit international, un courant

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did not intend s. 3(2)(a) of the *Citizenship Act* to apply to children of individuals who have not been granted diplomatic privileges and immunities. That being said, we would stress that it is not our intention to offer a definitive interpretation of s. 3(2)(a) in all respects, nor to foreclose the possibility that multiple reasonable interpretations of other aspects might be available to administrative decision makers. In short, we do not suggest that there is necessarily "one reasonable interpretation" of the provision as a whole. But we agree with the majority of the Court of Appeal that it was *not* reasonable for the Registrar to interpret s. 3(2)(a) as applying to children of individuals who have not been granted diplomatic privileges and immunities at the time of the children's birth.

[196] Given that it is undisputed that Ms. Vavilova and Mr. Bezrukov, as undercover spies, were granted no such privileges, it would serve no purpose to remit the matter in this case to the Registrar. Given that Mr. Vavilov is a person who was born in Canada after February 14, 1977, his status is governed only by the general rule set out in s. 3(1)(a) of the *Citizenship Act*. He is a Canadian citizen.

E. *Disposition*

[197] The appeal is dismissed with costs throughout to Mr. Vavilov.

The following are the reasons delivered by

[198] Abella and Karakatsanis JJ. — Forty years ago, in *Canadian Union of Public Employees, Local 963 v. New Brunswick Liquor Corp.*, [1979] 2 S.C.R. 227, this Court embarked on a course to recognize the unique and valuable role of administrative decision-makers within the Canadian legal order. Breaking away from the court-centric theories of years past, the Court encouraged judges to show deference when specialized administrative decision-makers provided reasonable answers to legal questions within their mandates. Building on

jurisprudentiel établi et le libellé même de la disposition — étayent la conclusion suivant laquelle le Parlement ne voulait pas que l'al. 3(2)a) de la *Loi sur la citoyenneté* s'applique aux enfants de personnes qui ne se sont pas vu accorder des privilèges et immunités diplomatiques. Cela établi, nous tenons à préciser que nous n'entendons pas donner une interprétation définitive de l'al. 3(2)a) à tous les égards, ni exclure la possibilité que les décideurs administratifs proposent plusieurs interprétations raisonnables d'autres aspects de la disposition. Autrement dit, nous ne proposons pas qu'il existe nécessairement « une seule interprétation raisonnable » de la disposition dans son ensemble. Par contre, nous convenons avec les juges majoritaires de la Cour d'appel que la greffière *ne pouvait* raisonnablement interpréter l'al. 3(2)a) comme s'appliquant à un enfant dont les parents, au moment de sa naissance, ne s'étaient pas vu accorder des privilèges et immunités diplomatiques.

[196] Puisque nul ne conteste que M^me^ Vavilova et M. Bezrukov, à titre d'espions infiltrés, n'avaient pas obtenu de tels privilèges, il ne servirait à rien en l'espèce de renvoyer l'affaire à la greffière. En tant que personne née au Canada après le 14 février 1977, M. Vavilov dispose d'un statut régi uniquement par la règle générale énoncée à l'al. 3(1)a) de la *Loi sur la citoyenneté*. Il est citoyen canadien.

E. *Dispositif*

[197] Le pourvoi est rejeté avec dépens devant notre Cour et les juridictions inférieures en faveur de M. Vavilov.

Version française des motifs rendus par

[198] Les juges Abella et Karakatsanis — Il y a 40 ans, dans l'arrêt *Syndicat canadien de la Fonction publique, section locale 963 c. Société des alcools du Nouveau-Brunswick*, [1979] 2 R.C.S. 227, notre Cour s'est engagée dans un processus visant à reconnaître le rôle unique et précieux que jouent les décideurs administratifs dans l'ordre juridique canadien. Rompant avec les conceptions judiciarisées qui avaient jusqu'alors la faveur, la Cour a incité les juges à faire preuve de déférence lorsque des décideurs administratifs spécialisés proposaient des

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this more mature understanding of administrative law, subsequent decisions of this Court sought to operationalize deference and explain its relationship to core democratic principles. These appeals offered a platform to clarify and refine our administrative law jurisprudence, while remaining faithful to the deferential path it has travelled for four decades.

[199] Regrettably, the majority shows our precedents no such fidelity. Presented with an opportunity to steady the ship, the majority instead dramatically reverses course — away from this generation's deferential approach and back towards a prior generation's more intrusive one. Rather than confirming a meaningful presumption of deference for administrative decision-makers, as our common law has increasingly done for decades, the majority's reasons strip away deference from hundreds of administrative actors subject to statutory rights of appeal; rather than following the consistent path of this Court's jurisprudence in understanding legislative intent as being the intention to leave legal questions within their mandate to specialized decision-makers with expertise, the majority removes expertise from the equation entirely and reformulates legislative intent as an overriding intention to provide — or not provide — appeal routes; and rather than clarifying the role of reasons and how to review them, the majority revives the kind of search for errors that dominated the pre-*C.U.P.E.* era. In other words, instead of *reforming* this generation's evolutionary approach to administrative law, the majority *reverses* it, taking it back to the formalistic judge-centred approach this Court has spent decades dismantling.

[200] We support the majority's decision to eliminate the vexing contextual factors analysis from the standard of review framework and to abolish the shibboleth category of "true questions of jurisdiction". These improvements, accompanied by a

réponses raisonnables à des questions de droit relevant de leur mandat. S'appuyant sur cette vision plus mûre du droit administratif, notre Cour a, dans ses décisions subséquentes, cherché à recourir concrètement au principe de la déférence et à expliquer sa relation avec les principes démocratiques fondamentaux. Les présents pourvois nous offraient l'occasion de clarifier et d'affiner notre jurisprudence en droit administratif, tout en demeurant fidèles au parcours empreint de déférence que cette jurisprudence a suivi depuis quatre décennies.

[199] Malheureusement, la majorité ne se montre pas aussi fidèle à nos précédents. Alors qu'elle se voit offrir l'occasion de garder le cap, elle choisit plutôt de faire volte-face, délaissant carrément l'approche axée sur la déférence de la génération actuelle et réintégrant la démarche plus interventionniste d'une génération antérieure. Au lieu de confirmer l'existence d'une présomption significative de déférence en faveur des décideurs administratifs, comme notre common law le fait de plus en plus depuis des décennies, les motifs de la majorité privent de déférence des centaines d'acteurs administratifs assujettis à des droits d'appel prévus par la loi. Au lieu d'appliquer la jurisprudence constante de notre Cour selon laquelle la volonté du législateur est de confier à des décideurs spécialisés possédant une expertise en la matière le soin de trancher les questions de droit relevant de leur mandat, la majorité fait table rase de l'expertise de ces décideurs et reformule la volonté du législateur comme étant centrée sur l'offre — ou non — de voies d'appel. Et, plutôt que de clarifier le rôle que jouent les motifs et de préciser comment on doit les contrôler, la majorité ressuscite la démarche axée sur la recherche d'erreurs qui occupait une place prépondérante à l'ère précédant l'arrêt *S.C.F.P.* En d'autres termes, au lieu de *réformer* l'approche évolutive du droit administratif de cette génération, la majorité la fait *régresser* en revenant à l'approche judiciarisée formaliste que notre Cour a mis des dizaines d'années à démanteler.

[200] Nous souscrivons à la décision de la majorité d'éliminer l'analyse contextuelle vexante du cadre d'analyse applicable à la norme de contrôle et d'abolir la catégorie rétrograde des « questions touchant vraiment à la compétence ». Ces améliorations,

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meaningful presumption of deference for administrative decision-makers, would have simplified our judicial review framework and addressed many of the criticisms levied against our jurisprudence since *Dunsmuir v. New Brunswick*, [2008] 1 S.C.R. 190.

[201] But the majority goes much further and fundamentally reorients the decades-old relationship between administrative actors and the judiciary, by dramatically expanding the circumstances in which generalist judges will be entitled to substitute their own views for those of specialized decision-makers who apply their mandates on a daily basis. In so doing, the majority advocates a profoundly different philosophy of administrative law than the one which has guided our Court's jurisprudence for the last four decades. The majority's reasons are an encomium for correctness and a eulogy for deference.

The Evolution of Canadian Administrative Law

[202] The modern Canadian state "could not function without the many and varied administrative tribunals that people the legal landscape" (The Rt. Hon. Beverley McLachlin, *Administrative Tribunals and the Courts: An Evolutionary Relationship*, May 27, 2013 (online)). Parliament and the provincial legislatures have entrusted a broad array of complex social and economic challenges to administrative actors, including regulation of labour relations, welfare programs, food and drug safety, agriculture, property assessments, liquor service and production, infrastructure, the financial markets, foreign investment, professional discipline, insurance, broadcasting, transportation and environmental protection, among many others. Without these administrative decision-makers, "government would be paralyzed, and so would the courts" (Guy Régimbald, *Canadian Administrative Law* (2nd ed. 2015), at p. 3).

[203] In exercising their mandates, administrative decision-makers often resolve claims and disputes

conjuguées à une véritable présomption de déférence à l'égard des décideurs administratifs, auraient simplifié notre cadre d'analyse du contrôle judiciaire et permis de répondre à bon nombre des critiques dont notre jurisprudence fait l'objet depuis l'arrêt *Dunsmuir c. Nouveau-Brunswick*, [2008] 1 R.C.S. 190.

[201] Mais la majorité va beaucoup plus loin et réoriente complètement le rapport qui existe depuis des décennies entre les acteurs administratifs et la magistrature, en élargissant considérablement les circonstances dans lesquelles les juges généralistes pourront substituer leur propre opinion à celle des décideurs spécialisés qui exercent leur mandat au quotidien. Ce faisant, la majorité préconise une philosophie du droit administratif profondément différente de celle qui a guidé la jurisprudence de notre Cour depuis une quarantaine d'années. Les motifs de la majorité font l'apologie de la norme de la décision correcte et sonnent le glas du principe de la déférence.

L'évolution du droit administratif canadien

[202] L'État moderne canadien « ne saurait fonctionner sans les nombreux tribunaux administratifs de diverses sortes qui [. . .] parsèment le paysage juridique » (la très honorable Beverley McLachlin, « Tribunaux administratifs et tribunaux judiciaires : une relation en évolution », 27 mai 2013 (en ligne)). Le Parlement et les législatures provinciales ont confié à des acteurs administratifs une vaste gamme d'enjeux sociaux et économiques complexes, notamment la réglementation des relations de travail, les programmes d'aide sociale, la sécurité des médicaments et des aliments, l'agriculture, l'évaluation foncière, la production et la vente d'alcool, les infrastructures, les marchés financiers, les investissements étrangers, la discipline professionnelle, les assurances, la radiodiffusion, le transport et la protection de l'environnement, pour n'en nommer que quelques-uns. Sans l'apport de ces décideurs administratifs [TRADUCTION] « le gouvernement serait paralysé, et les tribunaux aussi » (Guy Régimbald, *Canadian Administrative Law* (2e éd. 2015), p. 3).

[203] Dans le cadre de leur mandat, les décideurs administratifs sont souvent appelés à trancher des

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within their areas of specialization (Gus Van Harten et al., *Administrative Law: Cases, Text, and Materials* (7th ed. 2015), at p. 13). These claims and disputes vary greatly in scope and subject-matter. Corporate merger requests, professional discipline complaints by dissatisfied clients, requests for property reassessments and applications for welfare benefits, among many other matters, all fall within the purview of the administrative justice system.

[204] The administrative decision-makers tasked to resolve these issues come from many different walks of life (Van Harten et al., at p. 15). Some have legal backgrounds, some do not. The diverse pool of decision-makers in the administrative system responds to the diversity of issues that it must resolve. To address this broad range of issues, administrative dispute-resolution processes are generally "[d]esigned to be less cumbersome, less expensive, less formal and less delayed" than their judicial counterparts — but "no less effectiv[e] or credibl[e]" (*Rasanen v. Rosemount Instruments Ltd.* (1994), 17 O.R. (3d) 267 (C.A.), at p. 279). In the field of labour relations, for example, Parliament explicitly rejected a court-based system to resolve workplace disputes in favour of a Labour Board, staffed with representatives from management and labour alongside an independent member (Bora Laskin, "Collective Bargaining in Ontario: A New Legislative Approach" (1943), 21 *Can. Bar Rev.* 684; John A. Willes, *The Ontario Labour Court: 1943-1944* (1979); Katherine Munro, "A 'Unique Experiment': The Ontario Labour Court, 1943-1944" (2014), 74 *Labour* 199). Other administrative processes — license renewals, zoning permit issuances and tax reassessments, for example — bear even less resemblance to the traditional judicial model.

[205] Courts, through judicial review, monitor the boundaries of administrative decision making. Questions about the standards of judicial review have been an enduring feature of Canadian administrative law.

demandes et des différends qui relèvent de leur champ de spécialisation (Gus Van Harten et autres, *Administrative Law : Cases, Text, and Materials* (7e éd. 2015), p. 13). La portée et l'objet de ces demandes et de ces différends sont extrêmement diversifiés. Les demandes de fusion d'entreprises, les plaintes portées devant un ordre professionnel par des clients insatisfaits, les demandes de réévaluation foncière et les demandes de prestations d'aide sociale, pour ne citer que celles-là, relèvent toutes du système de justice administrative.

[204] Les décideurs administratifs chargés de résoudre ces questions proviennent d'une grande diversité de milieux (Van Harten et autres, *Administrative Law*, p. 15). Certains ont une formation juridique, d'autres non. Le bassin hétérogène de décideurs qui œuvrent au sein du système administratif témoigne de la diversité des questions qu'ils sont appelés à trancher. Pour les aider à s'attaquer à ce vaste éventail de questions, les mécanismes administratifs de règlement des différends qu'ils appliquent sont généralement [TRADUCTION] « conçus de manière à être moins lourds, moins coûteux, moins formels et moins longs » que leur pendant judiciaire, mais [TRADUCTION] « tout aussi efficaces et crédibles » (*Rasanen c. Rosemount Instruments Ltd.* (1994), 17 O.R. (3d) 267 (C.A.), p. 279). Dans le domaine des relations de travail, par exemple, le législateur fédéral a expressément refusé d'adopter un régime judiciaire de règlement des différends en milieu de travail au profit d'une commission du travail composée de représentants de la direction et des travailleurs, ainsi que de membres indépendants (Bora Laskin, « Collective Bargaining in Ontario : A New Legislative Approach » (1943), 21 *R. du B. can.* 684; John A. Willes, *The Ontario Labour Court : 1943-1944* (1979); Katherine Munro, « A "Unique Experiment" : The Ontario Labour Court, 1943-1944 » (2014), 74 *Le Travail* 199). D'autres processus administratifs — renouvellement de permis, délivrance de permis de zonage et réévaluation fiscale, par exemple — ressemblent encore moins au modèle judiciaire traditionnel.

[205] Les cours de justice, par le biais du contrôle judiciaire, supervisent les paramètres du processus décisionnel administratif. Les questions relatives aux normes de contrôle judiciaire reviennent comme

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The debate, in recent times, has revolved around "reasonableness" and "correctness", and determining when each standard applies. On the one hand, "reasonableness" review expects courts to defer to decisions by specialized decision-makers that "are defensible in respect of the facts and law"; on the other, "correctness" review allows courts to substitute their own opinions for those of the initial decision-maker (*Dunsmuir*, at paras. 47-50). This standard of review debate has profound implications for the extent to which reviewing courts may substitute their views for those of administrative decision-makers. At its core, it is a debate over two distinct philosophies of administrative law.

[206] The story of modern Canadian administrative law is the story of a shift away from the court-centric philosophy which denied administrative bodies the authority to interpret or shape the law. This approach found forceful expression in the work of Albert Venn Dicey. For Dicey, the rule of law meant the rule of courts. Dicey developed his philosophy at the end of the 19th century to encourage the House of Lords to restrain the government from implementing ameliorative social and welfare reforms administered by new regulatory agencies. Famously, Dicey asserted that administrative law was anathema to the English legal system (Albert Venn Dicey, *Introduction to the Study of the Law of the Constitution* (10th ed. 1959), at pp. 334-35). Because, in his view, only the judiciary had the authority to interpret law, there was no reason for a court to defer to legal interpretations proffered by administrative bodies, since their decisions did not constitute "law" (Kevin M. Stack, "Overcoming Dicey in Administrative Law" (2018), 68 *U.T.L.J.* 293, at p. 294).

[207] The canonical example of Dicey's approach at work is the House of Lords' decision in *Anisminic Ltd. v. Foreign Compensation Commission*, [1969] 2 A.C. 147, the judicial progenitor of "jurisdictional

un leitmotiv en droit administratif canadien. Ces derniers temps, le débat a été centré sur les normes de la « décision raisonnable » et de la « décision correcte », ainsi que sur la question de savoir dans quels cas l'une ou l'autre s'appliquait. D'une part, l'application de la norme de contrôle de la « décision raisonnable » suppose que les cours en défèrent aux décisions des décideurs spécialisés « pouvant se justifier au regard des faits et du droit »; d'autre part, la norme de la « décision correcte » permet aux cours de substituer leur propre opinion à celle du décideur initial (*Dunsmuir*, par. 47-50). Ce débat entourant la norme de contrôle applicable a des conséquences importantes sur la mesure dans laquelle les cours de révision peuvent substituer leur point de vue à celui des décideurs administratifs. Fondamentalement, ce débat porte sur deux conceptions distinctes du droit administratif.

[206] L'histoire du droit administratif canadien moderne est marquée par un virage consistant à se détourner de la philosophie judiciaire antérieure, qui refusait aux organismes administratifs le pouvoir d'interpréter ou de façonner le droit. Cette approche a été exprimée avec conviction par Albert Venn Dicey. Pour Dicey, primauté du droit était synonyme de primauté des cours. Dicey a élaboré sa philosophie à la fin du XIX^{e} siècle pour inciter la Chambre des lords à empêcher le gouvernement de mettre en œuvre les réformes d'assistance sociale administrées par de nouveaux organismes de réglementation. Dans une de ses déclarations célèbres, Dicey affirmait que le droit administratif représentait une abomination pour le système juridique anglais (Albert Venn Dicey, *An Introduction to the Study of the Law of the Constitution* (10^{e} éd. 1959), p. 334-335). Puisque, selon lui, seuls les juges avaient le pouvoir d'interpréter le droit, les cours n'avaient aucune raison de s'en remettre aux interprétations juridiques des organismes administratifs, puisque leurs décisions ne constituaient pas du « droit » (Kevin M. Stack, « Overcoming Dicey in Administrative Law » (2018), 68 *U.T.L.J.* 293, p. 294).

[207] L'exemple par excellence d'une application concrète de l'approche de Dicey est l'arrêt rendu par la Chambre des lords dans *Anisminic Ltd. c. Foreign Compensation Commission*, [1969] 2 A.C. 147, le

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error". *Anisminic* entrenched non-deferential judicial review by endorsing a lengthy checklist of "jurisdictional errors" capable of undermining administrative decisions. Lord Reid noted that there were two scenarios in which an administrative decision-maker would lose jurisdiction. The first was narrow and asked whether the legislature had empowered the administrative decision-maker to "enter on the inquiry in question" (p. 171). The second was wider:

> [T]here are many cases where, although the tribunal had jurisdiction to enter on the inquiry, it has done or failed to do something in the course of the inquiry which is of such a nature that its decision is a nullity. It may have given its decision in bad faith. It may have made a decision which it had no power to make. It may have failed in the course of the inquiry to comply with the requirements of natural justice. *It may in perfect good faith have misconstrued the provisions giving it power to act so that it failed to deal with the question remitted to it and decided some question which was not remitted to it. It may have refused to take into account something which it was required to take into account. Or it may have based its decision on some matter which, under the provisions setting it up, it had no right to take into account. I do not intend this list to be exhaustive.* [Emphasis added; p. 171.]

[208] The broad "jurisdictional error" approach in *Anisminic* initially found favour with this Court in cases like *Metropolitan Life Insurance Co. v. International Union of Operating Engineers, Local 796*, [1970] S.C.R. 425, and *Bell v. Ontario Human Rights Commission*, [1971] S.C.R. 756. These cases "took the position that a definition of jurisdictional error should include any question pertaining to the interpretation of a statute made by an administrative tribunal", and in each case, "th[e] Court substituted what was, in its opinion, the correct interpretation of the enabling provision of the tribunal's statute for that of the tribunal" (*Canada (Attorney General) v. Public Service Alliance of Canada*, [1991] 1 S.C.R. 614, at p. 650, per Cory J., dissenting, but not on this point). In *Metropolitan Life*, for example, this Court quashed a labour board's decision to certify a union, concluding that the Board had "ask[ed] itself the

précurseur judiciaire de la notion d'« erreur de compétence ». L'arrêt *Anisminic* a consacré le modèle du contrôle judiciaire non axé sur la déférence en entérinant une longue liste d'« erreurs de compétence » susceptibles de porter atteinte à la validité des décisions administratives. Lord Reid a fait observer qu'un décideur administratif perdait sa compétence dans deux cas précis. Le premier scénario, étant restrictif, consistait à se demander si le législateur avait habilité le décideur administratif à [TRADUCTION] « entreprendre l'examen en cause » (p. 171). Le second scénario avait une portée plus large :

> [TRADUCTION] [I]l y a de nombreux cas où, même s'il avait compétence pour entreprendre l'examen, le tribunal a, au cours de son examen, fait ou omis de faire quelque chose de nature à entacher sa décision de nullité. Il peut avoir rendu sa décision de mauvaise foi. Il peut avoir rendu une décision qu'il n'avait pas le pouvoir de rendre. Il peut avoir omis au cours de l'examen de se conformer aux exigences de la justice naturelle. *Il peut en toute bonne foi avoir mal interprété les dispositions lui donnant le pouvoir d'agir, de sorte qu'il n'a pas traité de la question qui lui était soumise et a tranché une question dont il n'était pas saisi. Il peut avoir refusé de prendre en compte quelque chose dont il devait tenir compte. Ou il peut avoir fondé sa décision sur une considération qu'il n'avait pas le droit de prendre en compte, selon les dispositions en vertu desquelles il a été créé. Cette énumération ne se veut pas exhaustive*. [Italique ajouté; p. 171.]

[208] La conception large de l'« erreur de compétence » retenue dans l'arrêt *Anisminic* a d'abord été accueillie favorablement par notre Cour dans des décisions comme *Metropolitan Life Insurance Co. c. International Union of Operating Engineers, Local 796*, [1970] R.C.S. 425, et *Bell c. Ontario (Human Rights Commission)*, [1971] R.C.S. 756. Dans ces arrêts, la Cour a « adopté la position qu'une définition de l'erreur juridictionnelle devrait comprendre toute question qui se rattache à l'interprétation d'une loi faite par un tribunal administratif », et dans chaque cas, « notre Cour a substitué ce qui, à son avis, constituait la bonne interprétation des dispositions habilitantes de la loi constitutive du tribunal, à celle donnée par ce tribunal » (*Canada (Procureur général) c. Alliance de la Fonction publique du Canada*, [1991] 1 R.C.S. 614, p. 650, le juge Cory, dissident, mais non sur ce point). Par

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wrong question" and "decided a question which was not remitted to it" (p. 435). In *Bell*, this Court held that a human rights commission had strayed beyond its jurisdiction by deciding to investigate a complaint of racial discrimination filed against a landlord. The Court held that the Commission had incorrectly interpreted the term "self-contained dwelling uni[t]" found in s. 3 of the *Ontario Human Rights Code*, *1961-62*, S.O. 1961-62, c. 93, and by so doing, had lost jurisdiction to inquire into the complaint of discrimination (pp. 767 and 775).

[209] As these cases illustrate, the *Anisminic* approach proved easy to manipulate, allowing courts to characterize any question as "jurisdictional" and thereby give themselves latitude to substitute their own view of the appropriate answer without regard for the original decision-maker's decision or reasoning. The *Anisminic* era and the "jurisdictional error" approach were and continue to be subject to significant judicial and academic criticism (*Public Service Alliance*, at p. 650; *National Corn Growers Assn. v. Canada (Import Tribunal)*, [1990] 2 S.C.R. 1324, at p. 1335, per Wilson J., concurring; Beverley McLachlin, P.C., "'Administrative Law is Not for Sissies': Finding a Path Through the Thicket" (2016), 29 *C.J.A.L.P.* 127, at pp. 129-30; Jocelyn Stacey and Alice Woolley, "Can Pragmatism Function in Administrative Law?" (2016), 74 *S.C.L.R.* (2d) 211, at pp. 215-16; R. A. Macdonald, "Absence of Jurisdiction: A Perspective" (1983), 43 *R. du B.* 307).

[210] In 1979, the Court signaled a turn to a more deferential approach to judicial review with its watershed decision in *C.U.P.E.* There, the Court challenged the "jurisdictional error" model and planted the seeds of a home-grown approach to administrative law in Canada. In a frequently-cited passage, Dickson J., writing for a unanimous Court, cautioned

exemple, dans l'arrêt *Metropolitan Life*, notre Cour a annulé la décision par laquelle une commission des relations du travail avait accrédité un syndicat, en concluant que la Commission s'était posé « la mauvaise question » et « a[vait] tranché une question qu'elle n'avait pas à trancher » (p. 435). Dans l'affaire *Bell*, notre Cour a jugé qu'une commission des droits de la personne avait outrepassé sa compétence en décidant d'enquêter sur une plainte de discrimination raciale portée contre un propriétaire. La Cour a conclu que la Commission avait mal interprété le terme « self-contained dwelling uni[t] » [unité d'habitation autonome] que l'on trouve à l'art. 3 de l'*Ontario Human Rights Code*, *1961-62*, S.O., 1961-1962, c. 93, et que, ce faisant, elle avait perdu sa compétence pour enquêter sur la plainte de discrimination (p. 767 et 775).

[209] Comme ces affaires l'illustrent, l'approche retenue dans l'arrêt *Anisminic* s'est avérée facilement manipulable et a permis aux cours de qualifier toute question de question « de compétence », se donnant ainsi la marge de manœuvre nécessaire pour substituer leur propre opinion quant à la réponse indiquée, sans égard à la décision ou au raisonnement du décideur initial. L'ère inaugurée par l'arrêt *Anisminic* et l'approche axée sur « l'erreur de compétence » ont fait et continuent de faire l'objet de vives critiques tant de la part des juges que des auteurs (*Alliance de la Fonction publique*, p. 650; *National Corn Growers Assn. c. Canada (Tribunal des importations)*, [1990] 2 R.C.S. 1324, p. 1335, motifs concordants de la juge Wilson; Beverley McLachlin, C.P., « "Administrative Law Is Not for Sissies" : Finding a Path through the Thicket » (2016), 29 *R.C.D.A.P.* 127, p. 129-130; Jocelyn Stacey et Alice Woolley, « Can Pragmatism Function in Administrative Law? » (2016), 74 *S.C.L.R.* (2d) 211, p. 215-216; R. A. Macdonald, « Absence of Jurisdiction : A Perspective » (1983), 43 *R. du B.* 307).

[210] En 1979, dans l'arrêt charnière *S.C.F.P.*, la Cour a amorcé un virage en proposant une démarche davantage axée sur la déférence en matière de contrôle judiciaire. Dans cet arrêt, la Cour a remis en question le modèle de l'« erreur de compétence » et a posé les jalons d'une conception résolument canadienne du droit administratif. Dans un passage souvent cité, le

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that courts "should not be alert to brand as jurisdictional, and therefore subject to broader curial review, that which may be doubtfully so" (p. 233; cited in nearly 20 decisions of this Court, including *Dunsmuir*, at para. 35; *Canada (Citizenship and Immigration) v. Khosa*, [2009] 1 S.C.R. 339, at para. 45; *Alberta (Information and Privacy Commissioner) v. Alberta Teachers' Association*, [2011] 3 S.C.R. 654, at para. 33; *Canada (Canadian Human Rights Commission) v. Canada (Attorney General)*, [2018] 2 S.C.R. 230, at para. 31). The Court instead endorsed an approach that respected the legislature's decision to assign legal policy issues in some areas to specialized, non-judicial decision-makers. The Court recognized that legislative language could "bristl[e] with ambiguities" and that the interpretive choices made by administrative tribunals deserved respect from courts, particularly when, as in *C.U.P.E.*, the decision was protected by a privative clause (pp. 230 and 234-36).

[211] By championing "curial deference" to administrative bodies, *C.U.P.E.* embraced "a more sophisticated understanding of the role of administrative tribunals in the modern Canadian state" (*National Corn Growers*, at p. 1336, per Wilson J., concurring; *Domtar Inc. v. Quebec (Commission d'appel en matière de lésions professionnelles)*, [1993] 2 S.C.R. 756, at p. 800). As one scholar has observed:

> . . . legislatures and courts in . . . Canada have come to settle on the idea that the functional capacities of administrative agencies — their expertise, investment in understanding the practical circumstances at issue, openness to participation, and level of responsiveness to political change — justify not only their law-making powers but also judicial deference to their interpretations and decisions. *Law-making and legal interpretation are shared enterprises in the administrative state*. [Emphasis added.]
>
> (Stack, at p. 310)

juge Dickson, qui écrivait au nom d'une Cour unanime, a formulé la mise en garde selon laquelle : « les tribunaux devraient éviter de qualifier trop rapidement un point de question de compétence, et ainsi de l'assujettir à un examen judiciaire plus étendu, lorsqu'il existe un doute à cet égard » (p. 233; ce passage a été repris dans près de 20 décisions de notre Cour, dont les arrêts *Dunsmuir*, par. 35; *Canada (Citoyenneté et Immigration) c. Khosa*, [2009] 1 R.C.S. 339, par. 45; *Alberta (Information and Privacy Commissioner) c. Alberta Teachers' Association*, [2011] 3 R.C.S. 654, par. 33; *Canada (Commission canadienne des droits de la personne) c. Canada (Procureur général)*, [2018] 2 R.C.S. 230, par. 31). La Cour préconisait plutôt une approche qui respectait la décision du législateur de confier, dans certains domaines, les questions de politiques juridiques à des décideurs spécialisés non judiciaires. La Cour a reconnu que les textes de loi pouvaient être « hérissé[s] d'ambiguïtés » et que les choix faits par les tribunaux administratifs en matière d'interprétation méritaient le respect des cours de justice, surtout lorsque, comme dans l'affaire *S.C.F.P.*, la décision était protégée par une clause privative (p. 230 et 234-236).

[211] En préconisant la retenue judiciaire envers les organismes administratifs, l'arrêt *S.C.F.P.* adoptait « une compréhension plus subtile du rôle des tribunaux administratifs dans l'État canadien moderne » (*National Corn Growers*, p. 1336, motifs concordants de la juge Wilson; *Domtar Inc. c. Québec (Commission d'appel en matière de lésions professionnelles)*, [1993] 2 R.C.S. 756, p. 800). Ainsi qu'un auteur l'a fait observer :

> [TRADUCTION] . . . les législatures et les tribunaux canadiens en sont venus à s'entendre sur l'idée que les capacités fonctionnelles des organismes administratifs — leur expertise, le temps et l'énergie qu'ils consacrent à comprendre les circonstances concrètes en jeu, leur ouverture à la participation et leur grande faculté d'adaptation aux changements politiques — justifiaient non seulement leurs pouvoirs en matière d'élaboration du droit, mais également la déférence des tribunaux judiciaires à l'égard de leurs interprétations et de leurs décisions. *L'élaboration et l'interprétation du droit sont des entreprises communes au sein de l'État administratif.* [Italique ajouté.]
>
> (Stack, p. 310)

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[212] In explaining why courts must sometimes defer to administrative actors, *C.U.P.E.* embraced two related foundational justifications for Canada's approach to administrative law — one based on the legislature's express choice to have an administrative body decide the issues arising from its mandate; and one animated by the recognition that an administrative justice system could offer institutional advantages in relation to proximity, efficiency, and specialized expertise (David Dyzenhaus, "The Politics of Deference: Judicial Review and Democracy" in Michael Taggart, ed., *The Province of Administrative Law* (1997), 279 at p. 304).

[213] A new institutional relationship between the courts and administrative actors was thus being forged, based on "an understanding of the role of expertise in the modern administrative state" which "acknowledge[d] that judges are not always in the best position to interpret the law" (The Hon. Frank Iacobucci, "Articulating a Rational Standard of Review Doctrine: A Tribute to John Willis" (2002), 27 *Queen's L.J.* 859, at p. 866).

[214] In subsequent decades, the Court attempted to reconcile the deference urged by *C.U.P.E.* with the lingering concept of "jurisdictional error". In *U.E.S., Local 298 v. Bibeault*, [1988] 2 S.C.R. 1048, the Court introduced the "pragmatic and functional" approach for deciding when a matter was within the jurisdiction of an administrative body. Instead of describing jurisdiction as a preliminary or collateral matter, the *Bibeault* test directed reviewing courts to consider the wording of the enactment conferring jurisdiction on the administrative body, the purpose of the statute creating the tribunal, the reason for the tribunal's existence, the area of expertise of its members, and the nature of the question the tribunal had to decide — all to determine whether the legislator "intend[ed] the question to be within the jurisdiction conferred on the tribunal" (p. 1087; see also p. 1088). If so, the tribunal's decision could only be set aside if it was "patently unreasonable" (p. 1086).

[212] Pour expliquer pourquoi les cours doivent parfois s'en remettre aux acteurs administratifs, l'arrêt *S.C.F.P.* accueillait deux fondements essentiels connexes justifiant la conception canadienne du droit administratif : l'un fondé sur le choix explicite du législateur de confier à un organisme administratif le soin de trancher les questions découlant de son mandat, l'autre motivé par la reconnaissance des avantages institutionnels du système de justice administrative au chapitre de la proximité, de l'efficacité et de l'expertise spécialisée (David Dyzenhaus, « The Politics of Deference : Judicial Review and Democracy » dans Michael Taggart, dir., *The Province of Administrative Law* (1997), 279, p. 304).

[213] Il s'est ainsi tissé entre les cours et les acteurs administratifs de nouveaux liens institutionnels fondés sur [TRADUCTION] « une perception du rôle de l'expertise au sein de l'État administratif moderne [qui] reconnaît [. . .] que les juges ne sont pas toujours les mieux placés pour interpréter les règles de droit en cause » (l'honorable Frank Iacobucci, « Articulating a Rational Standard of Review Doctrine : A Tribute to John Willis » (2002), 27 *Queen's L.J.* 859, p. 866).

[214] Dans les décennies qui ont suivi, la Cour a tenté de concilier la déférence préconisée par l'arrêt *S.C.F.P.* avec le concept persistant d'« erreur de compétence ». Dans l'arrêt *U.E.S., Local 298 c. Bibeault*, [1988] 2 R.C.S. 1048, la Cour a adopté la « méthode pragmatique et fonctionnelle » pour décider dans quels cas une affaire relevait de la compétence d'un organisme administratif. Au lieu de qualifier la compétence de question préliminaire ou accessoire, le critère énoncé dans l'arrêt *Bibeault* enjoignait aux cours de révision d'examiner le libellé de la disposition législative conférant compétence à l'organisme administratif, l'objet de la loi créant le tribunal administratif, la raison d'être de ce dernier, le champ d'expertise de ses membres et la nature de la question que le tribunal était appelé à trancher, le tout dans le but de déterminer si le législateur « voul[ait] qu'une telle matière relève de la compétence conférée au tribunal » (p. 1087; voir aussi p. 1088). Dans l'affirmative, la décision du tribunal ne pouvait être annulée que si elle était « manifestement déraisonnable » (p. 1086).

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[215] Although still rooted in a formalistic search for jurisdictional errors, the pragmatic and functional approach recognized that legislatures had assigned courts and administrative decision-makers distinct roles, and that the specialization and expertise of administrative decision-makers deserved deference. In her concurring reasons in *National Corn Growers*, Wilson J. noted that part of the process of moving away from Dicey's framework and towards a more sophisticated understanding of the role of administrative tribunals:

> . . . has involved a growing recognition on the part of courts that they may simply not be as well equipped as administrative tribunals or agencies to deal with issues which Parliament has chosen to regulate through bodies exercising delegated power, e.g., labour relations, telecommunications, financial markets and international economic relations. Careful management of these sectors often requires the use of experts who have accumulated years of experience and a specialized understanding of the activities they supervise. [p. 1336]

[216] By the mid-1990s, the Court had accepted that specialization and the legislative intent to leave issues to administrative decision-makers were inextricable and essential factors in the standard of review analysis. It stressed that "the expertise of the tribunal is of the utmost importance in determining the intention of the legislator with respect to the degree of deference to be shown to a tribunal's decision . . . [e]ven where the tribunal's enabling statute provides explicitly for appellate review" (*United Brotherhood of Carpenters and Joiners of America, Local 579 v. Bradco Construction Ltd.*, [1993] 2 S.C.R. 316, at p. 335). Of the factors relevant to setting the standard of review, expertise was held to be "the most important" (*Canada (Director of Investigation and Research) v. Southam Inc.*, [1997] 1 S.C.R. 748, at para. 50).

[217] Consistent with these judgments, this Court invoked the specialized expertise of a securities commission to explain why its decisions were entitled to deference on judicial review even when there

[215] Même si elle était encore ancrée dans une recherche formaliste d'erreurs de compétence, l'analyse pragmatique et fonctionnelle reconnaissait que les législateurs avait attribué des rôles distincts aux cours judiciaires et aux décideurs administratifs, et que la spécialisation et l'expertise des décideurs administratifs méritaient la déférence. Dans l'arrêt *National Corn Growers*, la juge Wilson fait observer dans ses motifs concordants que le fait de se détacher du cadre d'analyse de Dicey pour arriver à une compréhension plus poussée du rôle des tribunaux administratifs :

> . . . s'est traduit notamment par une reconnaissance accrue de la part des cours de justice qu'il se peut qu'elles soient simplement moins en mesure que les tribunaux ou organismes administratifs de statuer dans des domaines que le Parlement a choisi de réglementer par l'intermédiaire d'organismes exerçant un pouvoir délégué, comme, par exemple, les relations de travail, les télécommunications, les marchés financiers et les relations économiques internationales. Une gestion prudente de ces secteurs nécessite souvent le recours à des experts ayant à leur actif des années d'expérience et une connaissance spécialisée des activités qu'ils sont chargés de surveiller. [p. 1336]

[216] Au milieu des années 1990, la Cour a accepté que la spécialisation et la volonté du législateur de laisser aux décideurs administratifs le soin de trancher certaines questions étaient des facteurs indissociables et essentiels dans l'analyse de la norme de contrôle applicable. Elle a souligné que « [l']expertise [du tribunal] est de la plus haute importance pour ce qui est de déterminer l'intention du législateur quant au degré de retenue dont il faut faire preuve à l'égard de la décision d'un tribunal [. . .] [m]ême lorsque la loi habilitante du tribunal prévoit expressément l'examen par voie d'appel » (*Fraternité unie des charpentiers et menuisiers d'Amérique, section locale 579 c. Bradco Construction Ltd.*, [1993] 2 R.C.S. 316, p. 335). Parmi les facteurs dont on pouvait tenir compte pour établir la norme de contrôle applicable, l'expertise a été jugée « le plus important » (*Canada (Directeur des enquêtes et recherches) c. Southam Inc.*, [1997] 1 R.C.S. 748, par. 50).

[217] Conformément à ces arrêts, notre Cour a invoqué l'expertise spécialisée d'une commission des valeurs mobilières afin d'expliquer la raison pour laquelle les décisions de cette dernière avaient droit

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was a statutory right of appeal. Writing for a unanimous Court, Iacobucci J. explained that "the concept of the specialization of duties requires that deference be shown to decisions of specialized tribunals on matters which fall squarely within the tribunal's expertise" (*Pezim v. British Columbia (Superintendent of Brokers)*, [1994] 2 S.C.R. 557, at p. 591; see also *Bell Canada v. Canada (Canadian Radio-Television and Telecommunications Commission)*, [1989] 1 S.C.R. 1722, at pp. 1745-46). Critically, the Court's willingness to show deference demonstrated that specialization outweighed a statutory appeal as the most significant indicator of legislative intent.

[218] In *Pushpanathan v. Canada (Minister of Citizenship and Immigration)*, [1998] 1 S.C.R. 982, the Court reformulated the pragmatic and functional approach, engaging four slightly different factors from those in *Bibeault*, namely: (1) whether there was a privative clause, or conversely, a right of appeal; (2) the expertise of the decision-maker on the matter in question relative to the reviewing court; (3) the purpose of the statute as a whole, and of the provision in particular; and (4) the nature of the problem, i.e., whether it was a question of law, fact, or mixed law and fact (paras. 29-37). Instead of using these factors to answer whether a question was jurisdictional, *Pushpanathan* deployed them to discern how much deference the legislature intended an administrative decision to receive on judicial review. *Pushpanathan* confirmed three standards of review: patent unreasonableness, reasonableness *simpliciter*, and correctness (para. 27; see also *Southam*, at paras. 55-56).

[219] Significantly, *Pushpanathan* did not disturb the finding reaffirmed in *Southam* that specialized expertise was the most important factor in determining whether a deferential standard applied. Specialized expertise thus remained integral to the calibration of legislative intent, even in the face of statutory

à la déférence dans le cadre d'un contrôle judiciaire, même lorsqu'il existait un droit d'appel prévu par la loi. S'exprimant au nom de la Cour à l'unanimité, le juge Iacobucci a expliqué que « le concept de la spécialisation des fonctions exige des cours de justice qu'elles fassent preuve de retenue envers l'opinion du tribunal spécialisé sur des questions qui relèvent directement de son champ d'expertise » (*Pezim c. Colombie-Britannique (Superintendent of Brokers)*, [1994] 2 R.C.S. 557, p. 591; voir également *Bell Canada c. Canada (Conseil de la radiodiffusion et des télécommunications canadiennes)*, [1989] 1 R.C.S. 1722, p. 1745-1746). Fait crucial, la volonté de la Cour de faire preuve de déférence démontrait que la spécialisation l'emportait sur les droits d'appel conférés par la loi en tant qu'indicateur le plus révélateur de l'intention du législateur.

[218] Dans *Pushpanathan c. Canada (Ministre de la Citoyenneté et de l'Immigration)*, [1998] 1 R.C.S. 982, la Cour a reformulé l'analyse pragmatique et fonctionnelle, en faisant intervenir quatre facteurs légèrement différents de ceux énoncés dans *Bibeault*, à savoir : (1) l'existence d'une clause privative ou, à l'inverse, d'un droit d'appel; (2) l'expertise du décideur sur la question en cause par rapport à la cour de révision; (3) l'objet de la loi dans son ensemble et de la disposition en cause; (4) la nature du problème, c'est-à-dire à savoir s'il s'agit d'une question de droit, de fait ou d'une question mixte de droit et de fait (par. 29-37). Au lieu de recourir à ces facteurs pour répondre à la question de savoir si la question touchait à la compétence, la Cour les a employés dans *Pushpanthan* pour discerner le degré de déférence que le législateur entendait accorder à une décision administrative en contrôle judiciaire. L'arrêt *Pushpanathan* a confirmé trois normes de contrôle : la norme de la décision manifestement déraisonnable, la norme de la décision raisonnable *simpliciter* et la norme de la décision correcte (par. 27; voir également *Southam*, par. 55-56).

[219] Fait significatif, l'arrêt *Pushpanathan* n'a pas modifié la conclusion reprise dans l'arrêt *Southam* suivant laquelle l'expertise spécialisée était le facteur le plus important pour déterminer si une norme commandant la déférence s'appliquait. L'expertise spécialisée a donc continué à jouer un rôle essentiel

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rights of appeal (see *Law Society of New Brunswick v. Ryan*, [2003] 1 S.C.R. 247, at paras. 21 and 29-34; *Cartaway Resources Corp. (Re)*, [2004] 1 S.C.R. 672, at para. 45; *Council of Canadians with Disabilities v. VIA Rail Canada Inc.*, [2007] 1 S.C.R. 650, at paras. 88-92 and 100).

[220] Next came *Dunsmuir*, which sought to simplify the pragmatic and functional analysis while maintaining respect for the specialized expertise of administrative decision-makers. The Court merged the three standards of review into two: reasonableness and correctness. *Dunsmuir* also wove together the deferential threads running through the Court's administrative law jurisprudence, setting out a presumption of deferential review for certain categories of questions, including those where the decision-maker had expertise or was interpreting its "home" statute (paras. 53-54, per Bastarache and LeBel JJ., and para. 124, per Binnie J., concurring). Certain categories of issues remained subject to correctness review, including constitutional questions regarding the division of powers, true questions of jurisdiction, questions of law that were both of central importance to the legal system as a whole and outside the adjudicator's specialized area of expertise, and questions about jurisdictional lines between tribunals (paras. 58-61). Where the standard of review had not been satisfactorily determined in the jurisprudence, four contextual factors — the presence or absence of a privative clause, the purpose of the tribunal, the nature of the question at issue and the expertise of the tribunal — remained relevant to the standard of review analysis (para. 64).

[221] Notably, *Dunsmuir* did not mention statutory rights of appeal as one of the contextual factors, and left undisturbed their marginal role in the standard of review analysis. Instead, the Court explicitly affirmed the links between deference, the specialized expertise of administrative decision-makers and legislative intent. Justices LeBel and Bastarache held that "deference requires respect for the legislative choices to leave some matters in the hands of

pour discerner la volonté du législateur, même en présence d'un droit d'appel prévu par la loi (voir *Barreau du Nouveau-Brunswick c. Ryan*, [2003] 1 R.C.S. 247, par. 21 et 29-34; *Cartaway Resources Corp. (Re)*, [2004] 1 R.C.S. 672, par. 45; *Conseil des Canadiens avec déficiences c. VIA Rail Canada Inc.*, [2007] 1 R.C.S. 650, par. 88-92 et 100).

[220] Vint ensuite l'arrêt *Dunsmuir*, qui visait à simplifier l'analyse pragmatique et fonctionnelle tout en préservant le respect de l'expertise spécialisée des décideurs administratifs. La Cour a fusionné les trois normes de contrôle en deux : celle de la décision raisonnable et celle de la décision correcte. L'arrêt *Dunsmuir* a tissé le fil conducteur de toute la jurisprudence de la Cour en droit administratif en énonçant une présomption de contrôle empreint de déférence pour certaines catégories de questions, y compris celles pour lesquelles le décideur possède une expertise ou interprète sa loi constitutive (par. 53-54, les juges Bastarache et LeBel; et par. 124, motifs concordants du juge Binnie). Certaines catégories de questions demeuraient assujetties à la norme de la décision correcte, notamment les questions constitutionnelles touchant au partage des pouvoirs, les véritables questions de compétence, les questions de droit qui étaient à la fois d'une importance capitale pour le système juridique dans son ensemble et étrangères au domaine d'expertise du décideur, et les questions concernant la délimitation des compétences respectives des tribunaux administratifs (par. 58-61). Si la jurisprudence n'avait pas déjà établi de façon satisfaisante la norme de contrôle applicable, on pouvait encore tenir compte des quatre facteurs contextuels suivants pour déterminer la norme de contrôle applicable : l'existence ou l'inexistence d'une clause privative, la raison d'être du tribunal administratif, son expertise et la nature de la question en cause (par. 64).

[221] Fait intéressant à signaler, l'arrêt *Dunsmuir* ne mentionnait pas les droits d'appel prévus par la loi au nombre des facteurs contextuels et n'a pas modifié le rôle secondaire réservé à ces facteurs dans l'analyse de la norme de contrôle. La Cour a plutôt affirmé explicitement les liens qui existaient entre la déférence, l'expertise spécialisée des décideurs administratifs et l'intention du législateur. Les juges LeBel et Bastarache ont déclaré que « la déférence commande

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administrative decision makers, for the processes and determinations that draw on particular expertise and experiences, and for the different roles of the courts and administrative bodies within the Canadian constitutional system" (para. 49). They noted that "in many instances, those working day to day in the implementation of frequently complex administrative schemes have or will develop a considerable degree of expertise or field sensitivity to the imperatives and nuances of the legislative regime" (para. 49, citing David J. Mullan, "Establishing the Standard of Review: The Struggle for Complexity?" (2004), 17 *C.J.A.L.P.* 59, at p. 93).

[222] Post-*Dunsmuir*, this Court continued to stress that specialized expertise is the basis for making administrative decision-makers, rather than the courts, the appropriate forum to decide issues falling within their mandates (see *Khosa*, at para. 25; *R. v. Conway*, [2010] 1 S.C.R. 765, at para. 53; *McLean v. British Columbia (Securities Commission)*, [2013] 3 S.C.R. 895, at paras. 30-33). Drawing on the concept of specialized expertise, the Court's post-*Dunsmuir* cases expressly confirmed a presumption of reasonableness review for an administrative decision-maker's interpretation of its home or closely-related statutes (see *Alberta Teachers' Association*, at paras. 39-41). As Gascon J. explained in *Mouvement laïque québécois v. Saguenay (City)*, [2015] 2 S.C.R. 3, at para. 46:

> Deference is in order where the Tribunal acts within its specialized area of expertise . . . (*Saskatchewan (Human Rights Commission) v. Whatcott*, 2013 SCC 11, [2013] 1 S.C.R. 467, at paras. 166-68; *Mowat*, at para. 24). In *Alberta (Information and Privacy Commissioner) v. Alberta Teachers' Association*, 2011 SCC 61, [2011] 3 S.C.R. 654, at paras. 30, 34 and 39, the Court noted that, on judicial review of a decision of a specialized administrative tribunal interpreting and applying its enabling statute, it should be presumed that the standard of review is reasonableness (*Canadian National Railway Co. v. Canada (Attorney General)*, 2014 SCC 40, [2014] 2 S.C.R. 135, at para. 55; *Canadian Artists' Representation v. National Gallery of*

[. . .] le respect de la volonté du législateur de s'en remettre, pour certaines choses, à des décideurs administratifs, de même que des raisonnements et des décisions fondés sur une expertise et une expérience dans un domaine particulier, ainsi que de la différence entre les fonctions d'une cour de justice et celles d'un organisme administratif dans le système constitutionnel canadien » (par. 49). Ils ont fait remarquer que [TRADUCTION] « dans beaucoup de cas, les personnes qui se consacrent quotidiennement à l'application de régimes administratifs souvent complexes possèdent ou acquièrent une grande connaissance ou sensibilité à l'égard des impératifs et des subtilités des régimes législatifs en cause » (par. 49, citant David J. Mullan, « Establishing the Standard of Review : The Struggle for Complexity? » (2004), 17 *C.J.A.L.P.* 59, p. 93).

[222] Dans sa jurisprudence post-*Dunsmuir*, notre Cour a continué d'insister sur le fait que l'expertise spécialisée des décideurs administratifs était la raison pour laquelle ces derniers, et non les cours, constituaient l'instance appropriée pour trancher les questions relevant de leur mandat (voir *Khosa*, par. 25; *R. c. Conway*, [2010] 1 R.C.S. 765, par. 53; *McLean* c. *Colombie-Britannique (Securities Commission)*, [2013] 3 R.C.S. 895, par. 30-33). S'inspirant du concept de l'expertise spécialisée, les décisions rendues par la Cour après l'arrêt *Dunsmuir* ont expressément confirmé la présomption d'application de la norme de la décision raisonnable lorsqu'un décideur administratif interprète sa loi constitutive ou des lois qui y sont étroitement liées (voir *Alberta Teachers' Association*, par. 39-41). Ainsi que le juge Gascon l'a expliqué dans l'arrêt *Mouvement laïque québécois c. Saguenay (Ville)*, [2015] 2 R.C.S. 3, par. 46 :

> Lorsque le Tribunal agit à l'intérieur de son champ d'expertise [. . .] la déférence s'impose (*Saskatchewan (Human Rights Commission) c. Whatcott*, 2013 CSC 11, [2013] 1 R.C.S. 467, par. 166-168; *Mowat*, par. 24). Dans *Alberta (Information and Privacy Commissioner) c. Alberta Teachers' Association*, 2011 CSC 61, [2011] 3 R.C.S. 654, par. 30, 34 et 39, la Cour rappelle que, lors du contrôle judiciaire de la décision d'un tribunal administratif spécialisé qui interprète et applique sa loi constitutive, il y a lieu de présumer que la norme de contrôle est la décision raisonnable (*Compagnie des chemins de fer nationaux du Canada c. Canada (Procureur général)*, 2014 CSC 40, [2014] 2 R.C.S. 135, par. 55; *Front des artistes canadiens*

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Canada, 2014 SCC 42, [2014] 2 S.C.R. 197 ("*NGC*"), at para. 13; *Khosa*, at para. 25; *Smith v. Alliance Pipeline Ltd.*, 2011 SCC 7, [2011] 1 S.C.R. 160, at paras. 26 and 28; *Dunsmuir*, at para. 54).

[223] And in *Edmonton (City) v. Edmonton East (Capilano) Shopping Centres Ltd.*, [2016] 2 S.C.R. 293, the majority recognized:

> The presumption of reasonableness is grounded in the legislature's choice to give a specialized tribunal responsibility for administering the statutory provisions, and the expertise of the tribunal in so doing. Expertise arises from the specialization of functions of administrative tribunals like the Board which have a habitual familiarity with the legislative scheme they administer . . . . [E]xpertise is something that inheres in a tribunal itself as an institution: ". . . at an institutional level, adjudicators . . . can be presumed to hold relative expertise in the interpretation of the legislation that gives them their mandate, as well as related legislation that they might often encounter in the course of their functions." [Citation omitted; para. 33.]

[224] The presumption of deference, therefore, operationalized the Court's longstanding jurisprudential acceptance of the "specialized expertise" principle in a workable manner, continuing the deferential path Dickson J. first laid out in *C.U.P.E.*

[225] As for statutory rights of appeal, they continued to be seen as either an irrelevant factor in the standard of review analysis or one that yielded to specialized expertise. So firmly entrenched was this principle that in cases like *Bell Canada v. Bell Aliant Regional Communications*, [2009] 2 S.C.R. 764, *Smith v. Alliance Pipeline Ltd.*, [2011] 1 S.C.R. 160, *ATCO Gas and Pipelines Ltd. v. Alberta (Utilities Commission)*, [2015] 3 S.C.R. 219, and *Canada (Attorney General) v. Igloo Vikski Inc.*, [2016] 2 S.C.R. 80, the Court applied the reasonableness standard without even *referring* to the presence of an appeal clause. When appeal clauses *were* discussed, the Court consistently confirmed that they did not oust the application of judicial review principles.

c. Musée des beaux-arts du Canada, 2014 CSC 42, [2014] 2 R.C.S. 197 (« *MBA* »), par. 13; *Khosa*, par. 25; *Smith c. Alliance Pipeline Ltd.*, 2011 CSC 7, [2011] 1 R.C.S. 160, par. 26 et 28; *Dunsmuir*, par. 54).

[223] Dans l'arrêt *Edmonton (Ville) c. Edmonton East (Capilano) Shopping Centres Ltd.*, [2016] 2 R.C.S. 293, la majorité a reconnu ce qui suit :

> La présomption d'application de la norme de la décision raisonnable repose sur le choix du législateur de confier à un tribunal administratif spécialisé la responsabilité d'appliquer les dispositions législatives, ainsi que sur l'expertise de ce tribunal en la matière. L'expertise découle de la spécialisation des fonctions des tribunaux administratifs qui, comme le Comité, appliquent un régime législatif qui leur est familier [. . .] C'est [. . .] quelque chose d'inhérent au tribunal administratif en tant qu'institution : « . . . sur le plan institutionnel, on peut présumer que les arbitres [. . .] possèdent une expertise relative dans l'interprétation de la loi dont ils tiennent leur mandat ainsi que des dispositions législatives connexes qu'ils sont souvent appelés à appliquer dans l'exercice de leurs fonctions. » [Référence omise; par. 33.]

[224] La présomption de déférence a par conséquent permis d'employer le principe de « l'expertise spécialisée » qui était reconnu depuis longtemps par la jurisprudence de notre Cour, confirmant ainsi le principe de la déférence dont le juge Dickson avait posé les jalons dans l'arrêt *S.C.F.P.*

[225] Pour ce qui est des droits d'appel conférés par la loi, ils ont continué d'être perçus comme un facteur non pertinent dans l'analyse de la norme de contrôle ou comme un facteur qui devait céder le pas à l'expertise spécialisée. Ce principe était si fermement ancré que, dans des arrêts comme *Bell Canada c. Bell Aliant Communications régionales*, [2009] 2 R.C.S. 764, *Smith c. Alliance Pipeline Ltd.*, [2011] 1 R.C.S. 160, *ATCO Gas and Pipelines Ltd. c. Alberta (Utilities Commission)*, [2015] 3 R.C.S. 219, et *Canada (Procureur général) c. Igloo Vikski Inc.*, [2016] 2 R.C.S. 80, la Cour a appliqué la norme de la décision raisonnable sans même *mentionner* l'existence d'une disposition conférant un droit d'appel. Et, lorsqu'elle a *effectivement* parlé des dispositions prévoyant un droit d'appel, la Cour a systématiquement confirmé qu'elles n'excluaient pas l'application des principes du contrôle judiciaire.

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[226] In *Khosa*, Binnie J. explicitly endorsed *Pezim* and rejected "the idea that in the absence of express statutory language . . . a reviewing court is 'to apply a correctness standard as it does in the regular appellate context'" (para. 26). This reasoning was followed in *Canada (Canadian Human Rights Commission) v. Canada (Attorney General)*, [2011] 3 S.C.R. 471 ("*Mowat*"), where the Court confirmed that "care should be taken not to conflate" judicial and appellate review (para. 30; see also para. 31). In *McLean*, decided two years after *Mowat*, the majority cited *Pezim* and other cases for the proposition that "general administrative law principles still apply" on a statutory appeal (see para. 21, fn. 2). Similarly, in *Mouvement laïque*, Gascon J. affirmed that

> [w]here a court reviews a decision of a specialized administrative tribunal, the standard of review must be determined on the basis of administrative law principles. This is true regardless of whether the review is conducted in the context of an application for judicial review or of a statutory appeal . . . . [para. 38]

[227] In *Edmonton East*, the Court considered — and again rejected — the argument that statutory appeals should form a new category of correctness review. As the majority noted, "recognizing issues arising on statutory appeals as a new category to which the correctness standard applies — as the Court of Appeal did in this case — would go against strong jurisprudence from this Court" (para. 28). Even the dissenting judges in *Edmonton East*, although of the view that the wording of the relevant statutory appeal clause and legislative scheme pointed to the correctness standard, nonetheless unequivocally stated that "a statutory right of appeal is not a new 'category' of correctness review" (para. 70).

[226] Dans l'arrêt *Khosa*, le juge Binnie a explicitement souscrit à l'arrêt *Pezim* et rejeté « la thèse selon laquelle il faut, en l'absence d'une disposition législative expresse ou nécessairement implicite, que la cour de révision "applique la norme de la décision correcte, comme elle le fait normalement en appel" » (par. 26). Ce raisonnement a été suivi dans l'arrêt *Canada (Commission canadienne des droits de la personne) c. Canada (Procureur général)*, [2011] 3 R.C.S. 471 (« *Mowat* »), dans lequel la Cour a confirmé qu'« il faut se garder de [. . .] confondre » le contrôle judiciaire et l'appel (par. 30; voir également par. 31). Dans l'arrêt *McLean*, rendu deux ans après la décision *Mowat*, la majorité a cité l'arrêt *Pezim* et d'autres décisions à l'appui de la proposition suivant laquelle « les principes généraux de droit administratif s'appliquent tout de même » en cas d'appel prévu par la loi (voir par. 21, note en bas de page 2). De façon similaire, dans l'arrêt *Mouvement laïque*, le juge Gascon a affirmé que

> [l]orsqu'une cour de justice contrôle la décision d'un tribunal administratif spécialisé, la norme d'intervention doit être déterminée en fonction des principes du droit administratif. C'est le cas lorsque le contrôle s'exerce par suite d'une demande de révision judiciaire, mais aussi lorsqu'il procède par voie d'appel prévu par une loi . . . [par. 38]

[227] Dans l'affaire *Edmonton East*, la Cour a examiné — et de nouveau rejeté — l'argument voulant que les appels prévus par la loi doivent constituer une nouvelle catégorie révisable selon la norme de la décision correcte. Selon la majorité, « il serait contraire à la jurisprudence bien établie de la Cour de considérer — comme l'a fait la Cour d'appel en l'espèce — que les questions se soulevant dans le cadre d'un appel prévu par la loi forment une nouvelle catégorie de questions à laquelle s'applique la norme de la décision correcte » (par. 28). Dans l'arrêt *Edmonton East*, même s'ils estimaient qu'il appert du libellé de la disposition législative prévoyant un droit d'appel et de l'économie de la loi que la norme applicable était celle de la décision correcte, les juges dissidents ont néanmoins déclaré sans équivoque qu'« un droit d'appel statutaire ne forme pas une nouvelle "catégorie" à laquelle s'applique la norme de la décision correcte » (par. 70).

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[228] By the time these appeals were heard, contextual factors had practically disappeared from the standard of review analysis, replaced by a presumption of deference subject only to the correctness exceptions set out in *Dunsmuir* — which explicitly did *not* include statutory rights of appeal. In other words, the Court was well on its way to realizing *Dunsmuir*'s promise of a simplified analysis. Justice Gascon recognized as much last year in *Canadian Human Rights Commission*:

> *This contextual approach should be applied sparingly*. As held by the majority of this Court in *Alberta Teachers*, it is inappropriate to "retreat to the application of a full standard of review analysis where it can be determined summarily" . . . . After all, the "contextual approach can generate uncertainty and endless litigation concerning the standard of review" (*Capilano* [*Edmonton East*], at para. 35). The presumption of reasonableness review and the identified categories will generally be sufficient to determine the applicable standard. In the exceptional cases where such a contextual analysis may be justified to rebut the presumption, it need not be a long and detailed one (*Capilano* [*Edmonton East*], at para. 34). Where it has been done or referred to in the past, the analysis has been limited to determinative factors that showed a clear legislative intent justifying the rebuttal of the presumption (see, e.g., *Rogers*, at para. 15; *Tervita*, at paras. 35-36; see also, *Saguenay*, at paras. 50-51). [Emphasis added; para. 46.]

[229] In sum, for four decades, our standard of review jurisprudence has been clear and unwavering about the foundational role of specialized expertise and the limited role of statutory rights of appeal. Where confusion persists, it concerns the relevance of the contextual factors in *Dunsmuir*, the meaning of "true questions of jurisdiction" and how best to conduct reasonableness review. That was the backdrop against which these appeals were heard and argued. But rather than ushering in a simplified next act, these appeals have been used to rewrite the

[228] Au moment où les présents pourvois ont été entendus, les facteurs contextuels avaient pratiquement disparu de l'analyse de la norme de contrôle pour être remplacés par une présomption de déférence, sous réserve seulement des exceptions relatives à l'application de la norme de la décision correcte énoncées dans l'arrêt *Dunsmuir* — qui *n'*incluaient explicitement *pas* les droits d'appel conférés par la loi. En d'autres termes, la Cour était en bonne voie de réaliser la promesse d'une analyse simplifiée qu'elle avait faite dans l'arrêt *Dunsmuir*. C'est bien ce qu'a reconnu le juge Gascon l'an dernier dans l'arrêt *Commission canadienne des droits de la personne* :

> *Cette approche contextuelle devrait être appliquée avec parcimonie*. Comme l'ont déclaré les juges majoritaires de la Cour dans l'arrêt *Alberta Teachers*, il est inapproprié de « revenir à l'analyse exhaustive lorsqu'une démarche sommaire permet de déterminer la norme de contrôle » [. . .] En effet, le « recours à une analyse contextuelle peut être source d'incertitude et d'interminables litiges au sujet de la norme de contrôle applicable » (*Capilano* [*Edmonton East*], par. 35). La présomption d'application de la norme de la décision raisonnable et les catégories déjà énumérées suffiront généralement pour déterminer la norme de contrôle applicable. Dans les cas exceptionnels où il serait justifié de recourir à une analyse contextuelle pour repousser la présomption, celle-ci n'a pas à être longue et détaillée (*Capilano* [*Edmonton East*], par. 34). Dans les situations où tel était le cas, ou lorsqu'il en a été question par le passé, l'analyse ne portait que sur les facteurs déterminants qui révélaient une intention claire du législateur justifiant la réfutation de la présomption (voir, p. ex., *Rogers*, par. 15; *Tervita*, par. 35-36; voir également *Saguenay*, par. 50-51). [Italique ajouté; par. 46.]

[229] En somme, pendant quatre décennies, notre jurisprudence en matière de norme de contrôle a été claire et constante en ce qui concerne le rôle essentiel de l'expertise spécialisée et le rôle limité des droits d'appel conférés par la loi. La seule zone d'ombre qui subsiste a trait à la pertinence des facteurs contextuels énoncés dans l'arrêt *Dunsmuir*, au sens de l'expression « questions touchant vraiment à la compétence » et à la meilleure façon de procéder à un contrôle selon la norme de la décision raisonnable. C'est dans ce contexte que les présents pourvois ont été entendus

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whole script, reassigning to the courts the starring role Dicey ordained a century ago.

et plaidés. Mais au lieu d'ajouter une nouvelle scène simplifiée au film, les présents pourvois ont servi de prétexte pour récrire tout le scénario et réattribuer aux cours judiciaires le rôle principal que Dicey leur avait confié il y a un siècle.

The Majority's Reasons

[230] The majority's framework rests on a flawed and incomplete conceptual account of judicial review, one that unjustifiably ignores the specialized expertise of administrative decision-makers. Although the majority uses language endorsing a "presumption of reasonableness review", this presumption now rests on a totally new understanding of legislative intent and the rule of law. By prohibiting any consideration of well-established foundations for deference, such as "expertise . . . institutional experience . . . proximity and responsiveness to stakeholders . . . prompt[ness], flexib[ility], and efficien[cy]; and . . . access to justice", the majority reads out the foundations of the modern understanding of legislative intent in administrative law.

Les motifs de la majorité

[230] Le cadre établi par la majorité repose sur une conception du contrôle judiciaire qui est à la fois erronée et incomplète et qui néglige sans raison valable l'expertise spécialisée des décideurs administratifs. Bien que la majorité emploie des termes cautionnant une « présomption d'application de la norme de la décision raisonnable », cette présomption repose maintenant sur une compréhension totalement nouvelle de l'intention du législateur et de la primauté du droit. En interdisant toute prise en compte des postulats pourtant bien établis du principe de la déférence, comme « [l']expertise [. . .] l'expérience institutionnelle [. . .] la proximité des décideurs et des intervenants ainsi que la réceptivité de ces derniers [. . .] la rapidité, la souplesse et l'efficacité et [. . .] l'accès à la justice », la majorité fait fi des fondements de la conception moderne de l'intention du législateur en droit administratif.

[231] In particular, such an approach ignores the possibility that specialization and other advantages are embedded into the legislative choice to delegate particular subject matters to administrative decision-makers. Giving proper effect to the legislature's choice to "delegate authority" to an administrative decision-maker requires understanding the *advantages* that the decision-maker may enjoy in exercising its mandate (*Dunsmuir*, at para. 49). As Iacobucci J. observed in *Southam*:

> Presumably if Parliament entrusts a certain matter to a tribunal and not (initially at least) to the courts, *it is because the tribunal enjoys some advantage that judges do not*. For that reason alone, review of the decision of a tribunal should often be on a standard more deferential than correctness. [Emphasis added; para. 55.]

[231] En particulier, cette approche ne tient pas compte de la possibilité que la spécialisation fasse partie intégrante, avec d'autres avantages, du choix du législateur de déléguer certaines questions à des décideurs administratifs. Pour donner l'effet voulu à la volonté du législateur de « déléguer des pouvoirs » aux décideurs administratifs, il faut comprendre les *avantages* que peut comporter l'exercice, par ces décideurs, de leur mandat (*Dunsmuir*, par. 49). Comme le juge Iacobucci l'a fait observer dans l'arrêt *Southam* :

> Si le Parlement confie l'examen de certaines questions à un tribunal administratif plutôt qu'aux tribunaux ordinaires (du moins en première instance), *il est permis de présumer que c'est parce que le tribunal administratif apporte un certain avantage que les juges ne sont pas en mesure d'offrir*. Pour cette seule raison, le contrôle des décisions d'un tribunal administratif doit souvent se faire non pas en regard de la norme de la décision correcte, mais en fonction d'une norme exigeant de faire montre de retenue. [Italiques ajoutés; par. 55.]

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[232] Chief among those advantages are the institutional expertise and specialization inherent to administering a particular mandate on a daily basis. Those appointed to administrative tribunals are often chosen precisely because their backgrounds and experience align with their mandate (Van Harten et al., at p. 15; Régimbald, at p. 463). Some administrative schemes explicitly require a degree of expertise from new members as a condition of appointment (*Edmonton East*, at para. 33; *Dr. Q v. College of Physicians and Surgeons of British Columbia*, [2003] 1 S.C.R. 226, at para. 29; Régimbald, at p. 462). As institutions, administrative bodies also benefit from specialization as they develop "habitual familiarity with the legislative scheme they administer" (*Edmonton East*, at para. 33) and "grappl[e] with issues on a repeated basis" (*Parry Sound (District) Social Services Administration Board v. O.P.S.E.U., Local 324*, [2003] 2 S.C.R. 157, at para. 53). Specialization and expertise are further enhanced by continuing education and through meetings of the membership of an administrative body to discuss policies and best practices (Finn Makela, "Acquired Expertise of Administrative Tribunals and the Standard of Judicial Review: The Case of Grievance Arbitrators and Human Rights Law" (2013), 17 *C.L.E.L.J.* 345, at p. 349). In addition, the blended membership of some tribunals fosters special institutional competence in resolving "polycentric" disputes (*Pushpanathan*, at para. 36; *Dr. Q*, at paras. 29-30; *Pezim*, at pp. 591-92 and 596).

[233] All this equips administrative decision-makers to tackle questions of law arising from their mandates. In interpreting their enabling statutes, for example, administrative actors may have a particularly astute appreciation for the on-the-ground consequences of particular legal interpretations; of statutory context; of the purposes that a provision or legislative scheme are meant to serve; and of specialized terminology used in their administrative setting. Coupled with this Court's acknowledgment that legislative provisions often admit of multiple reasonable interpretations, the advantages

[232] Parmi ces avantages, mentionnons au premier chef l'expertise institutionnelle et la spécialisation inhérentes à l'exécution quotidienne d'un mandat particulier. Les personnes nommées pour siéger à des tribunaux administratifs sont souvent choisies précisément parce que leurs antécédents et leur expérience cadrent avec le mandat qu'elles sont appelées à remplir (Van Harten et autres, p. 15; Régimbald, p. 463). Certains régimes administratifs assujettissent précisément la nomination de nouveaux membres à la possession par ceux-ci d'un certain degré d'expertise (*Edmonton East*, par. 33; *Dr Q c. College of Physicians and Surgeons of British Columbia*, [2003] 1 R.C.S. 226, par. 29; Régimbald, p. 462). En tant qu'institutions, les organismes administratifs ont l'avantage de se spécialiser au fur et à mesure qu'ils sont appelés à appliquer « un régime législatif qui leur est familier » (*Edmonton East*, par. 33) et qu'ils « se prononce[nt] sur des questions de façon répétée » (*Parry Sound (District), Conseil d'administration des services sociaux c. S.E.E.F.P.O., section locale 324*, [2003] 2 R.C.S. 157, par. 53). La spécialisation et l'expertise sont encore renforcées par la formation continue et par des réunions où les membres des organismes administratifs discutent de politiques et de pratiques exemplaires (Finn Makela, « Acquired Expertise of Administrative Tribunals and the Standard of Judicial Review : The Case of Grievance Arbitrators and Human Rights Law » (2013), 17 *C.L.E.L.J.* 345, p. 349). En outre, la composition mixte de certains tribunaux administratifs favorise le développement d'une compétence institutionnelle particulière pour régler les différends « polycentriques » (*Pushpanathan*, par. 36; *Dr. Q*, par. 29-30; *Pezim*, p. 591-592 et 596).

[233] Les décideurs administratifs sont ainsi outillés pour s'attaquer aux questions de droit relevant de leur mandat. Lorsqu'ils interprètent leur loi habilitante, par exemple, les acteurs administratifs sont particulièrement bien placés pour saisir avec justesse les conséquences concrètes d'interprétations juridiques particulières, le contexte législatif, les objectifs qu'une disposition ou un régime législatifs sont censés viser et la terminologie spécialisée employée dans leur domaine administratif. Lorsqu'on y ajoute la reconnaissance par notre Cour du fait que les dispositions législatives se prêtent souvent

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stemming from specialization and expertise provide a robust foundation for deference to administrative decision-makers on legal questions within their mandate (*C.U.P.E.*, at p. 236; *McLean*, at para. 37). As Professor H. W. Arthurs said:

> There is no reason to believe that a judge who reads a particular regulatory statute once in his life, perhaps in worst-case circumstances, can read it with greater fidelity to legislative purpose than an administrator who is sworn to uphold that purpose, who strives to do so daily, and is well-aware of the effect upon the purpose of the various alternate interpretations. There is no reason to believe that a legally-trained judge is better qualified to determine the existence or sufficiency or appropriateness of evidence on a given point than a trained economist or engineer, an arbitrator selected by the parties, or simply an experienced tribunal member who decides such cases day in and day out. There is no reason to believe that a judge whose entire professional life has been spent dealing with disputes one by one should possess an aptitude for issues which arise often because an administrative system dealing with cases in volume has been designed to strike an appropriate balance between efficiency and effective rights of participation.

("Protection against Judicial Review" (1983), 43 *R. du B.* 277, at p. 289)

[234] Judges of this Court have endorsed both this passage and the broader proposition that specialization and expertise justify the deference owed to administrative decision-makers (*National Corn Growers*, at p. 1343, per Wilson J., concurring). As early as *C.U.P.E.*, Dickson J. fused expertise and legislative intent by explaining that an administrative body's specialized expertise can be essential to achieving the purposes of a statutory scheme:

> The Act calls for a delicate balance between the need to maintain public services, and the need to maintain collective bargaining. Considerable sensitivity and unique

à de multiples interprétations raisonnables, les avantages conférés par la spécialisation et l'expertise constituent une raison convaincante de faire preuve de déférence envers les décideurs administratifs sur les questions juridiques relevant de leur mandat (*S.C.F.P.*, p. 236; *McLean*, par. 37). Ainsi que l'a dit le professeur H. W. Arthurs :

> [TRADUCTION] Il n'y a aucune raison de croire que le juge appelé une seule fois dans sa vie à interpréter une loi de nature réglementaire — peut-être dans des conditions très peu enviables — soit en mesure de l'interpréter en respectant davantage l'objet de la loi que ne le ferait l'administrateur qui s'est engagé à faire respecter cet objet, qui s'efforce chaque jour de le faire et qui est bien conscient de l'effet qu'auront sur la réalisation de l'objet les différentes interprétations possibles. Il n'y a aucune raison de croire qu'un juge ayant une formation juridique est mieux qualifié pour décider de l'existence d'éléments de preuve se rapportant à un point donné ou pour se prononcer sur leur caractère suffisant ou leur pertinence que ne l'est l'économiste ou l'ingénieur de formation, l'arbitre choisi par les parties ou simplement le membre expérimenté d'un tribunal administratif appelé à trancher quotidiennement de tels cas. Il n'y a aucune raison de croire qu'un juge ayant consacré toute sa carrière à régler un seul litige à la fois possède une aptitude à trancher des questions qui, souvent, naissent du fait qu'un organisme administratif qui traite des affaires en grand nombre est conçu pour d'établir un juste équilibre entre l'efficacité et les droits effectifs de participation.

(« Protection against Judicial Review » (1983), 43 *R. du B.* 277, p. 289)

[234] Des juges de notre Cour ont souscrit à ce passage, ainsi qu'à l'idée plus générale suivant laquelle la spécialisation et l'expertise justifient la déférence due aux décideurs administratifs (*National Corn Growers*, p. 1343, motifs concordants de la juge Wilson). Déjà dans l'arrêt *S.C.F.P.*, le juge Dickson fusionnait l'expertise et l'intention du législateur en expliquant que l'expertise spécialisée d'un organisme administratif pouvait s'avérer essentielle à la réalisation des objectifs du régime législatif en cause :

> Cette loi établit un équilibre délicat entre le besoin de maintenir des services publics et le besoin de préserver la négociation collective. Pour atteindre ce double but,

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expertise on the part of Board members is all the more required if the twin purposes of the legislation are to be met. [p. 236]

[235] Over time, specialized expertise would become the core rationale for deferring to administrative decision-makers (*Bradco Construction*, at p. 335; *Southam*, at para. 50; Audrey Macklin, "Standard of Review: Back to the Future?", in Colleen M. Flood and Lorne Sossin, eds., *Administrative Law in Context* (3rd ed. 2018), 381, at pp. 397-98). Post-*Dunsmuir*, the Court has been steadfast in confirming the central role of specialization and expertise, affirming their connection to legislative intent, and recognizing that they give administrative decision-makers the "interpretative upper hand" on questions of law (*McLean*, at para. 40; see also *Conway*, at para. 53; *Mowat*, at para. 30; *Newfoundland and Labrador Nurses' Union v. Newfoundland and Labrador (Treasury Board)*, [2011] 3 S.C.R. 708, at para. 13; *Doré v. Barreau du Québec*, [2012] 1 S.C.R. 395, at para. 35; *Mouvement laïque*, at para. 46; *Khosa*, at para. 25; *Edmonton East*, at para. 33).

[236] Although the majority's approach extolls respect for the legislature's "institutional design choices", it accords no weight to the institutional advantages of specialization and expertise that administrative decision-makers possess in resolving questions of law. In so doing, the majority disregards the historically accepted reason *why* the legislature intended to delegate authority to an administrative actor.

[237] Nor are we persuaded by the majority's claim that "if administrative decision makers are understood to possess specialized expertise on all questions that come before them, the concept of expertise ceases to assist a reviewing court in attempting to distinguish questions for which applying the reasonableness standard is appropriate from those for which it is not". Here, the majority sets up a false choice: expertise must either be assessed on a case-by-case basis or play no role at all in a theory of judicial review.

les membres de la Commission doivent donc faire preuve d'une grande sensibilité à ces questions et d'une habileté unique. [p. 236]

[235] Avec le temps, l'expertise spécialisée est devenue la principale raison invoquée pour justifier la déférence envers les décideurs administratifs (*Bradco Construction*, p. 335; *Southam*, par. 50; Audrey Macklin, « Standard of Review : Back to the Future? » dans Colleen M. Flood et Lorne Sossin, dir., *Administrative Law in Context* (3e éd. 2018), 381, p. 397-398). Depuis l'arrêt *Dunsmuir*, la Cour n'a cessé de confirmer le rôle central que jouent la spécialisation et l'expertise, de confirmer le lien entre celles-ci et l'intention du législateur et de reconnaître qu'elles confèrent aux décideurs administratifs un « privilège en matière d'interprétation » sur les questions de droit (*McLean*, par. 40; voir également *Conway*, par. 53; *Mowat*, par. 30; *Newfoundland and Labrador Nurses' Union c. Terre-Neuve-et-Labrador (Conseil du Trésor)*, [2011] 3 R.C.S. 708, par. 13; *Doré c. Barreau du Québec*, [2012] 1 R.C.S. 395, par. 35; *Mouvement laïque*, par. 46; *Khosa*, par. 25; *Edmonton East*, par. 33).

[236] Même si l'approche préconisée par la majorité prône le respect des « choix d'organisation institutionnelle » du législateur, elle n'accorde aucun poids aux avantages institutionnels que possèdent les décideurs administratifs du fait de leur spécialisation et de leur expertise lorsqu'il s'agit de trancher des questions de droit. Ce faisant, la majorité ne tient pas compte de la raison historiquement reconnue *pour laquelle* le législateur souhaitait déléguer des pouvoirs à des acteurs administratifs.

[237] Nous ne sommes pas non plus convaincues par l'affirmation des juges majoritaires suivant laquelle « s'il est tenu pour acquis que le décideur administratif possède une expertise spécialisée en ce qui concerne l'ensemble des questions dont il est saisi, la notion d'expertise ne permet plus à la cour de révision de distinguer les questions auxquelles il y a lieu d'appliquer la norme de la décision raisonnable de celles auxquelles il n'y a pas lieu de l'appliquer ». En l'espèce, la majorité propose un faux dilemme : soit l'expertise doit être évaluée au cas par cas, soit elle ne joue aucun rôle dans la théorie du contrôle judiciaire.

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[238] We disagree. While not every decision-maker necessarily has expertise on every issue raised in an administrative proceeding, reviewing courts do not engage in an individualized, case-by-case assessment of specialization and expertise. The theory of deference is based not only on the legislative choice to delegate decisions, but also on institutional expertise and on "the reality that . . . those working day to day in the implementation of frequently complex administrative schemes have or will develop a considerable degree of expertise or field sensitivity to the imperatives and nuances of the legislative regime" (*Khosa*, at para. 25; see also *Nor-Man Regional Health Authority Inc. v. Manitoba Association of Health Care Professionals*, [2011] 3 S.C.R. 616, at para. 53; *Edmonton East*, at para. 33).

[239] The exclusion of expertise, specialization and other institutional advantages from the majority's standard of review framework is not merely a theoretical concern. The removal of the current "conceptual basis" for deference opens the gates to expanded correctness review. The majority's "presumption" of deference will yield all too easily to justifications for a correctness-oriented framework.

[240] In the majority's framework, deference gives way whenever the "rule of law" demands it. The majority's approach to the rule of law, however, flows from a court-centric conception of the rule of law rooted in Dicey's 19th century philosophy.

[241] The rule of law is not the rule of courts. A pluralist conception of the rule of law recognizes that courts are not the exclusive guardians of law, and that others in the justice arena have shared responsibility for its development, including administrative decision-makers. *Dunsmuir* embraced this more inclusive view of the rule of law by acknowledging that the "court-centric conception of the rule of law" had to be "reined in by acknowledging that the courts do not have a monopoly on deciding all questions

[238] Nous sommes en désaccord. Bien que les décideurs ne possèdent pas tous nécessairement une expertise sur chacune des questions soulevées dans une procédure administrative, les cours de révision ne procèdent pas à une évaluation individualisée, au cas par cas, de la spécialisation et de l'expertise. La théorie de la déférence repose non seulement sur le choix du législateur de déléguer certaines décisions, mais aussi sur l'expertise institutionnelle et sur le fait que « les personnes qui se consacrent quotidiennement à l'application de régimes administratifs souvent complexes possèdent ou acquièrent une grande connaissance ou sensibilité à l'égard des impératifs et des subtilités des régimes législatifs en cause » (*Khosa*, par. 25; voir également *Nor-Man Regional Health Authority Inc. c. Manitoba Association of Health Care Professionals*, [2011] 3 R.C.S. 616, par. 53; *Edmonton East*, par. 33).

[239] L'évacuation, par les juges majoritaires, de l'expertise, de la spécialisation et d'autres avantages institutionnels de leur cadre d'analyse ne pose pas problème seulement sur le plan théorique. La suppression du « fondement conceptuel » qui justifie actuellement la déférence ouvre les portes à un contrôle judiciaire élargi fondé sur la norme de la décision correcte. La « présomption » de déférence de la majorité ne s'inclinera que trop facilement devant les raisons invoquées pour justifier un cadre axé sur la norme de la décision correcte.

[240] Selon le cadre proposé par la majorité, la déférence est éclipsée chaque fois que la « primauté du droit » l'exige. La façon dont la majorité conçoit la primauté du droit découle toutefois d'une conception judiciarisée de celle-ci dont les origines remontent au XIX^e^ siècle, plus précisément aux théories de Dicey.

[241] La primauté du droit n'est pas la primauté des cours. Une conception pluraliste de la primauté du droit reconnaît que les cours ne sont pas les gardiens exclusifs du droit et que d'autres acteurs dans l'arène de la justice — dont les décideurs administratifs — ont également la responsabilité de l'élaborer. L'arrêt *Dunsmuir* a adhéré à cette vision plus inclusive de la primauté du droit en reconnaissant qu'il fallait « temp[érer] la conception judiciarisée de la primauté du droit [. . .] par la reconnaissance du fait

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of law" (para. 30). As discussed in *Dunsmuir*, the rule of law is understood as meaning that administrative decision-makers make legal determinations within their mandate, and not that only judges decide questions of law with an unrestricted license to substitute their opinions for those of administrative actors through correctness review (see McLachlin, *Administrative Tribunals and the Courts: An Evolutionary Relationship*; The Hon. Thomas A. Cromwell, "What I Think I've Learned About Administrative Law" (2017), 30 *C.J.A.L.P.* 307, at p. 308; *Wilson v. Atomic Energy of Canada Ltd.*, [2016] 1 S.C.R. 770, at para. 31, per Abella J.).

[242] Moreover, central to any definition of the rule of law is access to a fair and efficient dispute resolution process, capable of dispensing timely justice (*Hryniak v. Mauldin*, [2014] 1 S.C.R. 87, at para. 1). This is an important objective for all litigants, from the sophisticated consumers of administrative justice, to, most significantly, the particularly vulnerable ones (Angus Grant and Lorne Sossin, "Fairness in Context: Achieving Fairness Through Access to Administrative Justice", in Colleen M. Flood and Lorne Sossin, eds., *Administrative Law in Context* (3rd ed. 2018), 341, at p. 342). For this reason, access to justice is at the heart of the legislative choice to establish a robust system of administrative law (Grant and Sossin, at pp. 342 and 369-70; Van Harten, et al., at p. 17; Régimbald, at pp. 2-3; McLachlin, *Administrative Tribunals and the Courts: An Evolutionary Relationship*). As Morissette J.A. has observed:

> . . . the aims of administrative law . . . generally gravitate towards promoting access to justice. The means contemplated are costless or inexpensive, simple and expeditious procedures, expertise of the decision-makers, coherence of reasons, consistency of results and finality of decisions.

(Yves-Marie Morissette, "What is a 'reasonable decision'?" (2018), 31 *C.J.A.L.P.* 225, at p. 236)

que les cours de justice n'ont pas le pouvoir exclusif de statuer sur toutes les questions de droit » (par. 30). Comme la Cour l'a expliqué dans l'arrêt *Dunsmuir*, la primauté du droit signifie que les décideurs administratifs prennent des décisions juridiques dans le cadre de leur mandat et non que seuls les juges peuvent trancher des questions de droit et ont carte blanche pour substituer leur opinion à celle des acteurs administratifs par le biais d'un contrôle selon la norme de la décision correcte (voir McLachlin, « Tribunaux administratifs et tribunaux judiciaires : une relation en évolution »; l'hon. Thomas A. Cromwell, « What I Think I've Learned About Administrative Law » (2017), 30 *R.C.D.A.P.* 307, p. 308; *Wilson c. Énergie atomique Canada Ltée.*, [2016] 1 R.C.S. 770, par. 31, la juge Abella).

[242] De plus, un des aspects essentiels de toute définition de la primauté du droit est l'accès équitable et efficace à un mécanisme de règlement des différends propre à rendre justice en temps opportun (*Hryniak c. Mauldin*, [2014] 1 R.C.S. 87, par. 1). Il s'agit d'un objectif important pour tous les justiciables, des consommateurs avertis de la justice administrative jusqu'aux citoyens les plus vulnérables — et de manière plus significative pour ces derniers (Angus Grand et Lorne Sossin, « Fairness in Context : Achieving Fairness Through Access to Administrative Justice », dans Colleen M. Flood et Lorne Sossin, dir., *Administrative Law in Context* (3e éd. 2018), 341, p. 342). Pour cette raison, l'accès à la justice est au cœur du choix du législateur d'instaurer un système de droit administratif solide (Grant et Sossin, p. 342 et 369-370; Van Harten et autres, *Administrative Law*, p. 17; Régimbald, p. 2-3; McLachlin, *Administrative Tribunals and the Courts : An Evolutionary Relationship*). Comme le juge d'appel Morissette l'a fait observer :

> [TRADUCTION] . . . les objectifs du droit administratif [. . .] sont en règle générale axés sur la promotion de l'accès à la justice. Parmi les moyens envisagés, mentionnons les mesures peu coûteuses, simples et expéditives, l'expertise des décideurs, la cohérence des motifs, l'uniformité des résultats et le caractère définitif des décisions.

(Yves-Marie Morissette, « What is a "reasonable decision"? » (2018), 31 *R.C.D.A.P.* 225, p. 236)

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[243] These goals are compromised when a narrow conception of the "rule of law" is invoked to impose judicial hegemony over administrative decision-makers. Doing so perverts the purpose of establishing a parallel system of administrative justice, and adds unnecessary expense and complexity for the public.

[244] The majority even calls for a reformulation of the "questions of central importance" category from *Dunsmuir* and permits courts to substitute their opinions for administrative decision-makers on "questions of central importance to the legal system as a whole", even if those questions fall squarely within the mandate and expertise of the administrative decision-maker. As noted in *Canadian Human Rights Commission*, correctness review was permitted only for questions "of central importance to the legal system *and* outside the specialized expertise of the adjudicator" (para. 28 (emphasis in original)). Broadening this category from its original characterization unduly expands the issues available for judicial substitution. Issues of discrimination, labour rights, and economic regulation of the securities markets (among many others) theoretically raise questions of vital importance for Canada and its legal system. But by ignoring administrative decision-makers' expertise on these matters, this category will inevitably provide more "room . . . for both mistakes and manipulation" (Andrew Green, "Can There Be Too Much Context in Administrative Law? Setting the Standard of Review in Canadian Administrative Law" (2014), 47 *U.B.C. L. Rev.* 443, at p. 483). We would leave *Dunsmuir*'s description of this category undisturbed.[1]

[245] We also disagree with the majority's reformulation of "legislative intent" to include, for the first time, an invitation for courts to apply correctness

[243] Ces objectifs sont compromis lorsqu'on invoque une conception étroite de la « primauté du droit » pour imposer l'hégémonie judiciaire aux décideurs administratifs. Ce faisant, on pervertit l'objectif d'établir un système parallèle de justice administrative et on augmente inutilement les coûts et la complexité pour le public.

[244] Les juges majoritaires vont même jusqu'à réclamer une reformulation de la catégorie des « questions d'importance capitale » tirée de l'arrêt *Dunsmuir* qui permettrait aux cours de substituer leur opinion à celle des décideurs administratifs sur des questions qui sont « d'importance capitale pour le système juridique dans son ensemble », même si ces questions relèvent nettement du mandat et de l'expertise du décideur administratif. Tel que la Cour l'a signalé dans *Commission canadienne des droits de la personne*, le contrôle selon la norme de la décision correcte n'était permis que pour les questions « d'importance capitale pour le système juridique *et* qui échappent au domaine d'expertise de l'arbitre » (par. 28 (en italique dans l'original)). Étendre cette catégorie par rapport à son acception initiale a pour conséquence d'étendre indûment les questions pour lesquelles les cours peuvent substituer leur propre opinion à celle des décideurs administratifs. En théorie, les enjeux de discrimination, de droits des travailleurs et de réglementation économique des marchés des valeurs mobilières (pour n'en mentionner que quelques-uns) soulèvent des questions qui revêtent une importance vitale pour le Canada et son système juridique. Mais en ignorant l'expertise des décideurs administratifs sur les questions susmentionnées, cette catégorie fera immanquablement augmenter le [TRADUCTION] « risque d'erreurs et de manipulation » (Andrew Green, « Can There Be Too Much Context in Administrative Law? Setting the Standard of Review in Canadian Administrative Law » (2014), 47 *U.B.C. L. Rev.* 443, p. 483). Nous estimons qu'il n'y a pas lieu de modifier la définition de cette catégorie proposée dans l'arrêt *Dunsmuir*[1].

[245] Nous sommes également en désaccord avec la reformulation de la notion de « l'intention du législateur » proposée par la majorité, qui invite pour

[1] Other than one of the two *amici*, no one asked us to modify this category.

[1] À part l'un des deux *amici curiae*, personne ne nous a demandé de modifier cette catégorie.

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review to legal questions whenever an administrative scheme includes a right of appeal. We do not see how appeal rights represent a "different institutional structure" that requires a more searching form of review. The mere fact that a statute contemplates a reviewing role for a court says nothing about the *degree of deference* required in the review process. Rights of appeal reflect different choices by different legislatures to permit review for different reasons, on issues of fact, law, mixed fact and law, and discretion, among others. Providing parties with a right of appeal can serve several purposes entirely unrelated to the standard of review, including outlining: where the appeal will take place (sometimes, at a different reviewing court than in the routes provided for judicial review); who is eligible to take part; when materials must be filed; how materials must be presented; the reviewing court's powers on appeal; any leave requirements; and the grounds on which the parties may appeal (among other things). By providing this type of structure and guidance, statutory appeal provisions may allow legislatures to promote efficiency and access to justice, in a way that exclusive reliance on the judicial review procedure would not have.

la première fois les cours de révision à appliquer la norme de contrôle de la décision correcte à des questions de droit lorsqu'un régime administratif prévoit un droit d'appel. Nous ne voyons pas en quoi l'existence de droits d'appel crée un « régime institutionnel différent » qui commanderait un contrôle plus fouillé. Le simple fait qu'une loi envisage la possibilité pour une cour de justice d'exercer un contrôle ne permet pas de tirer de conclusions quant au *degré de déférence* requis lors du contrôle en question. Les droits d'appel reflètent les divers choix faits par diverses législatures pour permettre le contrôle judiciaire, pour diverses raisons, notamment le contrôle des questions de fait, des questions de droit, des questions mixtes de fait et de droit et de la façon dont a été exercé un pouvoir discrétionnaire. Le fait d'accorder aux parties un droit d'appel peut servir plusieurs fins totalement étrangères à la norme de contrôle, notamment préciser quelle cour sera saisie de l'appel (parfois, il peut s'agir d'une cour de révision différente de celle habituellement chargée de statuer sur les demandes de contrôle judiciaire), qui est admissible, quand les documents doivent être déposés, sous quelle forme ils doivent être présentés, les pouvoirs de la cour de révision en appel, les exigences à respecter pour obtenir l'autorisation d'interjeter appel et les moyens d'appel dont les parties peuvent se prévaloir. En prévoyant ce type de structure et de balises, les dispositions législatives en matière d'appel permettent aux législatures de promouvoir l'efficacité et l'accès à la justice d'une manière qui n'aurait pas été possible si l'on s'en était remis exclusivement au contrôle judiciaire.

[246] In reality, the majority's position on statutory appeal rights, although couched in language about "giv[ing] effect to the legislature's institutional design choices", hinges almost entirely on a textualist argument: the presence of the word "appeal" indicates a legislative intent that courts apply the same standards of review found in civil appellate jurisprudence.

[246] En réalité, même si, au chapitre des droits d'appel conférés par la loi, la majorité évoque le « respec[t] [des] choix d'organisation institutionnelle du législateur », sa position repose presque exclusivement sur un argument textuel suivant lequel la présence du mot « appel » indique que le législateur voulait que les cours de révision appliquent les mêmes normes de contrôle que celles que les cours d'appel appliquent dans leurs arrêts en matière civile.

[247] The majority's reliance on the "presumption of consistent expression" in relation to the single word "appeal" is misplaced and disregards long-accepted institutional distinctions between how

[247] Le fait que la majorité invoque la « présomption d'uniformité d'expression » en se fondant uniquement sur le mot « appel » est malavisé et néglige les distinctions institutionnelles qui sont reconnues

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courts and administrative decision-makers function. The language in each setting is different; the mandates are different; the policy bases are different. The idea that *Housen v. Nikolaisen*, [2002] 2 S.C.R. 235, must be inflexibly applied to every right of "appeal" within a statute — with no regard for the broader purposes of the statutory scheme or the practical implications of greater judicial involvement within it — is entirely unsupported by our jurisprudence.

[248] In addition, the majority's claim that legislatures "d[o] not speak in vain" is irreconcilable with its treatment of privative clauses, which play no role in its standard of review framework. If, as the majority claims, Parliament's decision to provide appeal routes must influence the standard of review analysis, there is no principled reason why Parliament's decision via privative clauses to *prohibit* appeals should not be given comparable effect.[2]

[249] In any event, legislatures in this country have known for at least 25 years since *Pezim* that this Court has not treated statutory rights of appeal as a determinative reflection of legislative intent regarding the standard of review (*Pezim*, at p. 590). Against this reality, the continued use by legislatures of the term "appeal" cannot be imbued with the intent that the majority retroactively ascribes to it; doing so is inconsistent with the principle that legislatures are presumed to enact legislation in compliance with existing common law rules (Ruth Sullivan, *Statutory Interpretation* (3rd ed. 2016), at p. 315).

depuis longtemps en ce qui concerne le mode de fonctionnement des cours et des décideurs administratifs. Les mots employés dans chaque contexte sont différents, les mandats sont différents et les considérations de principe sont différentes. L'idée selon laquelle il faut appliquer de façon inflexible l'arrêt *Housen c. Nikolaisen*, [2002] 2 R.C.S. 235, à tous les droits d'« appel » accordés par une loi sans égard aux objectifs plus larges du régime législatif ou aux conséquences pratiques d'une plus grande intervention judiciaire dans ce régime ne trouve aucun appui dans notre jurisprudence.

[248] De plus, l'affirmation de la majorité suivant laquelle le législateur « ne parle pas pour ne rien dire » est inconciliable avec son interprétation des clauses privatives, qui ne jouent aucun rôle dans son cadre d'analyse de la norme de contrôle. Si, comme la majorité le prétend, le choix du Parlement de conférer des droits d'appel doit influencer l'analyse de la norme de contrôle, il n'y a aucune raison de principe pour laquelle la décision du Parlement d'*interdire* les appels au moyen de clauses privatives ne devrait pas avoir d'effet comparable[2].

[249] En tout état de cause, les législatures canadiennes savent depuis au moins 25 ans, depuis l'arrêt *Pezim*, que notre Cour ne considère pas les droits d'appel accordés par une loi comme une expression déterminante de l'intention du législateur en ce qui concerne la norme de contrôle applicable (*Pezim*, p. 590). Face à cette réalité, l'emploi systématique du terme « appel » par les législatures ne saurait s'expliquer par l'intention que la majorité lui prête rétroactivement; cette façon de procéder est incompatible avec le principe suivant lequel les législatures sont présumées adopter des lois conformément aux règles de common law existantes (Ruth Sullivan, *Statutory Interpretation* (3e éd. 2016), p. 315).

[2] The "constitutional concerns" cited by the majority are no answer to this dilemma — nothing in *Crevier v. Attorney General of Quebec*, [1981] 2 S.C.R. 220, prevents privative clauses from influencing the *standard* of review, as they did for years under the pragmatic and functional approach and in *C.U.P.E.* (David Dyzenhaus, "Dignity in Administrative Law: Judicial Deference in a Culture of Justification" (2012), 17 *Rev. Const. Stud.* 87, at p. 103; David Mullan, "Unresolved Issues on Standard of Review in Canadian Judicial Review of Administrative Action – The Top Fifteen!" (2013), 42 *Adv. Q.* 1, at p. 21).

[2] Les « préoccupations constitutionnelles » citées par la majorité ne constituent pas une solution à ce dilemme : rien dans l'arrêt *Crevier c. Procureur général du Québec*, [1981] 2 R.C.S. 220, n'empêche les clauses privatives d'influencer la *norme* de contrôle, comme c'était le cas pendant des années selon l'analyse pragmatique et fonctionnelle, ainsi que dans l'arrêt *S.C.F.P.* (David Dyzenhaus, « Dignity in Administrative Law : Judicial Deference in a Culture of Justification » (2012), 17 *R. études const.* 87, p. 103; David Mullan, « Unresolved Issues on Standard of Review in Canadian Judicial Review of Administrative Action — the Top Fifteen! » (2013), 42 *Adv. Q.* 1, p. 21).

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[250] Those legislatures, moreover, understood from our jurisprudence that this Court was committed to respecting *standards* of review that were statutorily prescribed, as British Columbia alone has done.[3] We agree with the Attorney General of Canada's position in the companion appeals of *Bell Canada v. Canada (Attorney General)*, [2019] 4 S.C.R. 845, that, absent exceptional circumstances, the existence of a statutory right of appeal does not displace the presumption that the standard of reasonableness applies.[4] The majority, however, has inexplicably chosen the template proposed by the *amici*,[5] recommending a sweeping overhaul of our approach to legislative intent and to the determination of the standard of review.

[251] The result reached by the majority means that hundreds of administrative decision-makers subject to different kinds of statutory rights of appeal — some in highly specialized fields, such as broadcasting, securities regulation and international trade — will now be subject to an irrebuttable presumption of correctness review. This has the potential to cause a stampede of litigation. Reviewing courts will have license to freely revisit legal questions on matters squarely within the expertise of administrative decision-makers, even if they are of no broader consequence outside of their administrative regimes. Even if specialized decision-makers provide reasonable interpretations of highly technical statutes with which they work daily, even if they provide internally consistent interpretations

[250] Ces législatures ont d'ailleurs compris, à la lumière de notre jurisprudence, que notre Cour s'était engagée à respecter les *normes* de contrôle prescrites par la loi, un choix législatif qui n'a été exercé que par la Colombie-Britannique[3]. Nous souscrivons à la position du procureur général du Canada dans les pourvois connexes *Bell Canada c. Canada (Procureur général)*, [2019] 4 R.C.S. 845, selon laquelle, sauf en présence de circonstances exceptionnelles, un droit d'appel conféré par la loi n'écarte pas la présomption d'application de la norme de la décision raisonnable[4]. La majorité a toutefois retenu, pour une raison inconnue, le modèle proposé par les *amici curiae*[5], qui recommandent une refonte complète de notre vision de l'intention du législateur et de la manière dont nous déterminons la norme de contrôle applicable.

[251] Le résultat auquel arrive la majorité signifie que des centaines de décideurs administratifs soumis à différents types de droit d'appel conférés par la loi — certains dans des domaines hautement spécialisés comme la radiodiffusion, la réglementation des valeurs mobilières et le commerce international — seront désormais assujettis à une présomption irréfragable d'application de la norme de la décision correcte. Cela risque de provoquer une avalanche de litiges. Il sera désormais loisible aux cours de révision de réexaminer à leur guise des questions de droit portant sur des enjeux qui relèvent carrément de l'expertise des décideurs administratifs, même si leurs conséquences ne débordent pas le cadre du régime administratif de ces décideurs. Même si les

[3] See *Administrative Tribunals Act*, S.B.C. 2004, c. 45. Quebec's recent attempt to introduce such legislation is another example of a legislature which understood that it was free to set standards of review, and that the mere articulation of a right of appeal did not dictate what those standards would be: see Bill 32, *An Act mainly to promote the efficiency of penal justice and to establish the terms governing the intervention of the Court of Québec with respect to applications for appeal*, 1st Sess., 42nd Leg., 2019.

[4] The notion that legislative intent finds determinative expression in statutory rights of appeal found no support in the submissions of four of the five attorneys general who appeared before us.

[5] Even the *amici* did not go so far as to say that *all* appeal clauses were indicative of a legislative intent for courts to substitute their views on questions of law.

[3] Voir *l'Administrative Tribunal Act*, S.B.C. 2004, c. 45. La tentative récente du Québec d'adopter une loi semblable est un autre exemple d'une législature qui a compris qu'elle était libre d'établir des normes de contrôle et que la simple existence d'un droit d'appel ne dictait pas la nature des normes en question. Voir le projet de loi 32, *Loi visant principalement à favoriser l'efficacité de la justice pénale et à établir les modalités d'intervention de la Cour du Québec dans un pourvoi en appel*, 42e lég., 1re sess., 2019.

[4] L'idée selon laquelle la volonté du législateur trouve son expression la plus éloquente dans les droits d'appel prévus par une loi ne trouve appui dans aucune des observations formulées par quatre des cinq procureurs généraux qui ont comparu devant nous.

[5] Même les *amici curiae* ne sont pas allés jusqu'à affirmer que *toutes* les dispositions créant un droit d'appel témoignaient de l'intention du législateur de permettre aux cours de substituer leur opinion à celle des décideurs administratifs sur des questions de droit.

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responsive to the parties' submissions and consistent with the text, context and purpose of the governing scheme, the administrative body's past practices and decisions, the common law, prior judicial rulings and international law, those interpretations can still be set aside by a reviewing court that simply takes a different view of the relevant statute. This risks undermining the integrity of administrative proceedings whenever there is a statutory right of appeal, rendering them little more than rehearsals for a judicial appeal — the inverse of the legislative intent to establish a specialized regime and entrust certain legal and policy questions to non-judicial actors.

décideurs spécialisés proposent des interprétations valables de lois très techniques avec lesquelles ils travaillent quotidiennement, même s'ils proposent des interprétations intrinsèquement cohérentes qui tiennent compte des observations des parties et qui sont conformes au texte, au contexte et à l'objet du régime applicable, ainsi qu'aux pratiques et décisions antérieures de l'organe administratif, à la common law, aux décisions judiciaires antérieures et au droit international, ces interprétations pourront toujours être écartées par la cour de révision qui a simplement un point de vue différent sur la loi applicable. Cela risque de compromettre l'intégrité des procédures administratives chaque fois que la loi prévoit un droit d'appel et de réduire les procédures administratives à guère plus qu'une répétition générale en vue d'un appel judiciaire, ce qui est le contraire de l'intention du législateur de créer un régime spécialisé et de confier à des acteurs non judiciaires certaines questions de politique et de droit.

[252] Ironically, the majority's approach will be a roadblock to its promise of simplicity. Elevating appeal clauses to indicators of correctness review creates a two-tier system of administrative law: one tier that defers to the expertise of administrative decision-makers where there is no appeal clause; and another tier where such clauses permit judges to substitute their own views of the legal issues at the core of those decision-makers' mandates. Within the second tier, the application of appellate law principles will inevitably create confusion by encouraging segmentation in judicial review (*Mouvement laïque*, at para. 173, per Abella J., concurring in part; see also Paul Daly, "Struggling Towards Coherence in Canadian Administrative Law? Recent Cases on Standard of Review and Reasonableness" (2016), 62 *McGill L.J.* 527, at pp. 542-43; the Hon. Joseph T. Robertson, "Identifying the Review Standard: Administrative Deference in a Nutshell" (2017), 68 *U.N.B.L.J.* 145, at p. 162). Courts will be left with the task of identifying palpable and overriding errors for factual questions, extricating legal issues from questions of mixed fact and law, reviewing questions of law *de novo*, and potentially having to apply judicial review and appellate standards interchangeably if an applicant challenges in one proceeding multiple aspects of an administrative decision, some falling

[252] Ironiquement, la démarche proposée par la majorité créera un obstacle à la réalisation de sa promesse de simplicité. En élevant des dispositions créant un droit d'appel au rang d'indicateurs d'un contrôle assujetti à la norme de la décision correcte, on crée un système de droit administratif à deux vitesses dans lequel on aurait, d'une part, un système dans le cadre duquel les juges s'en remettent à l'expertise des décideurs administratifs lorsqu'il n'existe pas de dispositions d'appel et, d'autre part, un autre système selon lequel l'existence de telles dispositions permettrait au juge de substituer à l'opinion du décideur administratif sa propre opinion sur les questions de droit au cœur même du mandat de ces décideurs. Dans ce dernier cas, l'application des principes de droit en matière d'appel créera inévitablement de la confusion en favorisant le fractionnement du contrôle judiciaire (*Mouvement laïque*, par. 173, motifs concordants en partie de la juge Abella; voir également Paul Daly, « Struggling Towards Coherence in Canadian Administrative Law? Recent Cases on Standard of Review and Reasonableness » (2016), 62 *R.D. McGill* 527, p. 542-543; l'hon. Joseph T. Robertson, « Identifying the Review Standard : Administrative Deference in a Nutshell » (2017), 68 *R.D. U.N.-B.* 145, p. 162). Il reviendra aux cours de déceler les erreurs manifestes et déterminantes dans le cas des questions de fait, à

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within an appeal clause and others not. It is an invitation to complexity and a barrier to access to justice.

[253] The majority's reasons "roll back the *Dunsmuir* clock to an era where some courts asserted a level of skill and knowledge in administrative matters which further experience showed they did not possess" (*Khosa*, at para. 26). The reasons elevate statutory rights of appeal to a determinative factor based on a formalistic approach that ignores the legislature's intention to leave certain legal and policy questions to specialized administrative decision-makers. This unravelling of Canada's carefully developed, deferential approach to administrative law returns us to the "black letter law" approach found in *Anisminic* and cases like *Metropolitan Life* whereby specialized decision-makers were subject to the pre-eminent determinations of a judge. Rather than building on *Dunsmuir*, which recognized that specialization is fundamentally intertwined with the legislative choice to delegate particular subject matters to administrative decision-makers, the majority's reasons banish expertise from the standard of review analysis entirely, opening the door to a host of new correctness categories which remain open to further expansion. The majority's approach not only erodes the presumption of deference; it erodes confidence in the existence — and desirability — of the "shared enterprises in the administrative state" of "[l]aw-making and legal interpretation" between courts and administrative decision-makers (Stack, at p. 310).

[254] But the aspect of the majority's decision with the greatest potential to undermine both the integrity

dissocier les questions de droit des questions mixtes de fait et de droit, à procéder à un examen *de novo* des questions de droit et éventuellement à se voir contraints d'appliquer de façon interchangeable les normes du contrôle judiciaire et les normes d'appel lorsqu'un demandeur conteste dans la même instance plusieurs aspects de la décision administrative dont certains relèvent d'une disposition créant un droit d'appel et d'autres non. Il s'agit d'une incitation à la complexité et d'un obstacle à l'accès à la justice.

[253] Les motifs de la majorité nous font « retourner à l'époque où certains tribunaux judiciaires s'attribuaient, en matière administrative, certaines compétences et connaissances qu'ils se sont en fait avérés ne pas posséder » (*Khosa*, par. 26). La majorité élève les droits d'appel prévus par la loi au rang de facteurs déterminants en appliquant une approche formaliste qui néglige la volonté du législateur de laisser à des décideurs administratifs spécialisés le soin de trancher certaines questions de droit et de politique. Cet effritement d'une conception canadienne du droit administratif qui a été élaborée avec soin et qui repose sur la déférence nous ramène à la démarche fondée sur des « règles de droit immuables » que l'on trouve notamment dans l'arrêt *Anisminic* et dans des affaires comme *Metropolitan Life*, où des décideurs spécialisés étaient à la merci des décisions souveraines d'un ou d'une juge. Plutôt que de s'appuyer sur l'arrêt *Dunsmuir*, qui reconnaissait que la spécialisation était indissociable de la volonté du législateur de déléguer certaines questions à des décideurs administratifs, les motifs de la majorité évacuent totalement l'expertise de l'analyse relative à la norme de contrôle, ouvrant ainsi la porte à la création d'une multitude de nouvelles catégories de normes de contrôle fondées sur la décision correcte dont la portée risque elle aussi d'être élargie. L'approche de la majorité affaiblit non seulement la présomption de déférence, mais mine aussi la confiance envers l'existence — et l'opportunité — de favoriser une [TRADUCTION] « participation commune [des cours et des décideurs administratifs] au fonctionnement de l'État administratif en ce qui concerne l'élaboration et l'interprétation du droit » (Stack, p. 310).

[254] Mais l'aspect de la décision de la majorité qui risque le plus de compromettre l'intégrité des

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of this Court's decisions, and public confidence in the stability of the law, is its disregard for precedent and *stare decisis*.

[255] *Stare decisis* places significant limits on this Court's ability to overturn its precedents. Justice Rothstein described some of these limits in *Canada v. Craig*, [2012] 2 S.C.R. 489, the case about horizontal *stare decisis* on which the majority relies:

> The question of whether this Court should overrule one of its own prior decisions was addressed recently in *Ontario (Attorney General) v. Fraser*, 2011 SCC 20, [2011] 2 S.C.R. 3. At paragraph 56, Chief Justice McLachlin and LeBel J., in joint majority reasons, noted that overturning a precedent of this Court is a step not to be lightly undertaken. *This is especially so when the precedent represents the considered views of firm majorities* (para. 57).
>
> Nonetheless, this Court has overruled its own decisions on a number of occasions. (See *R. v. Chaulk*, [1990] 3 S.C.R. 1303, at p. 1353, *per* Lamer C.J., for the majority; *R. v. B. (K.G.)*, [1993] 1 S.C.R. 740; *R. v. Robinson*, [1996] 1 S.C.R. 683.) *However, the Court must be satisfied based on compelling reasons that the precedent was wrongly decided and should be overruled . . . .*
>
> Courts must proceed with caution when deciding to overrule a prior decision. In *Queensland v. Commonwealth* (1977), 139 C.L.R. 585 (H.C.A.), at p. 599, Justice Gibbs articulated the required approach succinctly:
>
> > No Justice is entitled to ignore the decisions and reasoning of his predecessors, and to arrive at his own judgment as though the pages of the law reports were blank, or as though the authority of a decision did not survive beyond the rising of the Court. A Justice, unlike a legislator, cannot introduce a programme of reform which sets at nought decisions formerly made and principles formerly established. It is only after the most careful and respectful consideration of the earlier decision, and after giving due weight to all the circumstances, that a Justice may give effect to his own opinions in preference to an earlier decision of the Court. [Emphasis added; paras. 24-26.]

décisions de notre Cour et d'ébranler la confiance du public à l'égard de la stabilité du droit est son mépris des précédents et de la règle du *stare decisis*.

[255] La règle du *stare decisis* limite considérablement la capacité de notre Cour d'infirmer ses propres précédents. Le juge Rothstein a précisé certaines de ces limites dans l'arrêt *Canada c. Craig*, [2012] 2 R.C.S. 489, qui est la décision relative à l'application de la règle du *stare decisis* par une juridiction du même degré sur laquelle la majorité se fonde :

> Notre Cour a récemment examiné, dans *Ontario (Procureur général) c. Fraser*, 2011 CSC 20, [2011] 2 R.C.S. 3, si elle devait écarter l'une de ses propres décisions. Au paragraphe 56, la juge en chef McLachlin et le juge LeBel soulignent, dans leurs motifs conjoints pour la majorité, qu'il ne convient pas d'écarter un précédent à la légère. *C'est particulièrement vrai lorsque le précédent exprime l'avis réfléchi de majorités claires* (par. 57).
>
> Il est malgré tout arrivé à plusieurs reprises que la Cour écarte ses propres décisions. (Voir *R. c. Chaulk*, [1990] 3 R.C.S. 1303, p. 1353, le juge en chef Lamer pour la majorité; *R. c. B. (K.G.)*, [1993] 1 R.C.S. 740; *R. c. Robinson*, [1996] 1 R.C.S. 683.) *Il lui faut toutefois être convaincue, pour des raisons impérieuses, que la décision est erronée et qu'elle devrait être écartée . . .*
>
> La prudence est de mise lorsqu'il s'agit de décider de rompre avec une décision antérieure. Dans *Queensland c. Commonwealth* (1977), 139 C.L.R. 585 (H.C.A.), p. 599, le juge Gibbs a articulé de façon concise l'approche qui s'impose :
>
> > [TRADUCTION] Nul juge ne peut ignorer les décisions et le raisonnement de ses prédécesseurs et arriver à ses propres conclusions comme si la jurisprudence n'existait pas, ou qu'une décision cessait d'être opposable dès l'ajournement d'une session. Contrairement au législateur, le juge ne peut entreprendre une réforme qui réduit à néant les décisions antérieures et les principes établis précédemment. Ce n'est qu'après avoir examiné la décision antérieure de la cour le plus attentivement et le plus respectueusement possible, et après avoir dûment considéré toutes les circonstances, que le juge peut faire primer sa propre opinion sur elle. [Italiques ajoutés, par. 24-26.]

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[256] Apex courts in several jurisdictions outside Canada have similarly stressed the need for caution and compelling justification before departing from precedent. The United States Supreme Court refrains from overruling its past decisions absent a "special justification", which must be over and above the belief that a prior case was wrongly decided (*Kimble v. Marvel Entertainment, LLC*, 135 S. Ct. 2401 (2015), at p. 2409; see also *Halliburton Co. v. Erica P. John Fund, Inc.*, 573 U.S. 258 (2014), at p. 266; *Kisor v. Wilkie*, 139 S. Ct. 2400 (2019), at pp. 2418 and 2422; Bryan A. Garner et al., *The Law of Judicial Precedent* (2016), at pp. 35-36).

[257] Similarly, the House of Lords "require[d] much more than doubts as to the correctness of [a past decision] to justify departing from it" (*Fitzleet Estates Ltd. v. Cherry* (1977), 51 T.C. 708, at p. 718), an approach that the United Kingdom Supreme Court continues to endorse (*R. v. Taylor*, [2016] UKSC 5, [2016] 4 All E.R. 617, at para. 19; *Willers v. Joyce (No. 2)*, [2016] UKSC 44, [2017] 2 All E.R. 383, at para. 7; *Knauer v. Ministry of* Justice, [2016] UKSC 9, [2016] 4 All E.R. 897, at paras. 22-23).

[258] New Zealand's Supreme Court views "caution, often considerable caution" as the "touchstone" of its approach to horizontal *stare decisis*, and has emphasized that it will not depart from precedent "merely because, if the matter were being decided afresh, the Court might take a different view" (*Couch v. Attorney-General (No. 2)*, [2010] NZSC 27, [2010] 3 N.Z.L.R. 149, at paras. 105, per Tipping J., and 209, per McGrath J.).

[259] Restraint and respect for precedent also guide the High Court of Australia and South Africa's Constitutional Court when applying *stare decisis* (*Lee v. New South Wales Crime Commission*, [2013] HCA 39, 302 A.L.R. 363, at paras. 62-66 and 70; *Camps Bay Ratepayers' and Residents' Association v. Harrison*, [2010] ZACC 19, 2011 (4) S.A. 42, at pp. 55-56; *Buffalo City Metropolitan Municipality*

[256] À l'étranger, certaines des juridictions les plus élevées ont également souligné la nécessité de faire preuve de prudence et d'invoquer des raisons impérieuses avant de s'écarter d'un précédent. La Cour suprême des États-Unis refuse d'écarter ses propres décisions à moins qu'il existe une [TRADUCTION] « justification spéciale », qui doit être plus que la simple conviction qu'une décision antérieure était mal fondée (*Kimble c. Marvel Entertainment, LLC*, 135 S. Ct. 2401 (2015), p. 2409; voir aussi *Halliburton Co. c. Erica P. John Fund, Inc.*, 573 U.S. (2014), p. 266; *Kisor c. Wilkie*, 139 S. Ct. 2400 (2019), p. 2418 et 2422; Bryan A. Garner et autres, *The Law of Judicial Precedent* (2016), p. 35-36).

[257] De même, la Chambre des lords [TRADUCTION] « exige bien davantage qu'un doute sur le bien-fondé d'une [décision antérieure] pour justifier de s'en écarter » (*Fitzleet Estates Ltd. c. Cherry* (1977), 51 T.C. 708, p. 718), une approche à laquelle souscrit toujours la Cour suprême du Royaume-Uni (*R. c. Taylor*, [2016] UKSC 5, [2016] 4 All E.R. 617, par. 19; *Willers c. Joyce (No. 2)*, [2016] UKSC 44, [2017] 2 All E.R. 383, par. 7; *Knauer c. Ministry of Justice*, [2016] UKSC 9, [2016] 4 All E.R. 897, par. 22-23).

[258] Pour sa part, la Cour suprême de la Nouvelle-Zélande considère [TRADUCTION] « la prudence, souvent une prudence considérable » comme la « pierre angulaire » de l'application de la règle du *stare decisis* par une juridiction du même degré, ajoutant qu'elle refuse d'écarter un précédent « pour la simple raison que, si la question était jugée de nouveau, la Cour pourrait adopter un point de vue différent » (*Couch c. Attorney General (No. 2)*, [2010] NZSC 27, [2010] 3 N.Z.L.R. 149, par. 105, le juge Tipping, et par. 209, le juge McGrath).

[259] La retenue et le respect des précédents guident également la Haute Cour de l'Australie et la Cour constitutionnelle de l'Afrique du Sud dans l'application de la règle du *stare decisis* (*Lee c. New South Wales Crime Commission*, [2013] HCA 39, 302 A.L.R. 363, par. 62-66 et 70; *Camps Bay Ratepayers' and Residents' Association c. Harrison*, [2010] Z.A.C.C. 19, 2011 (4) S.A. 42, p. 55-56;

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v. Asla Construction (Pty) Ltd., [2019] ZACC 15, 2019 (4) S.A. 331, at para. 65).

[260] The virtues of horizontal *stare decisis* are widely recognized. The doctrine "promotes the even-handed, predictable, and consistent development of legal principles, fosters reliance on judicial decisions, and contributes to the actual and perceived integrity of the judicial process" (*Kimble*, at p. 2409, citing *Payne v. Tennessee*, 501 U.S. 808 (1991), at p. 827). This Court has stressed the importance of *stare decisis* for "[c]ertainty in the law" (*Canada (Attorney General) v. Bedford*, [2013] 3 S.C.R. 1101, at para. 38; *R. v. Bernard*, [1988] 2 S.C.R. 833, at p. 849; *Minister of Indian Affairs and Northern Development v. Ranville*, [1982] 2 S.C.R. 518, at p. 527). Other courts have described *stare decisis* as a "foundation stone of the rule of law" (*Michigan v. Bay Mills Indian Community*, 572 U.S. 782 (2014), at p. 798; *Kimble*, at p. 2409; *Kisor*, at p. 2422; see also *Camps Bay*, at pp. 55-56; Jeremy Waldron, "*Stare Decisis* and the Rule of Law: A Layered Approach" (2012), 111 *Mich. L. Rev.* 1, at p. 28; Lewis F. Powell, Jr., "*Stare Decisis* and Judicial Restraint" (1990), 47 *Wash. & Lee L. Rev.* 281, at p. 288).

[261] Respect for precedent also safeguards this Court's institutional legitimacy. The precedential value of a judgment of this Court does not "expire with the tenure of the particular panel of judges that decided it" (*Plourde v. Wal-Mart Canada Corp.*, [2009] 3 S.C.R. 465, at para. 13). American cases have stressed similar themes:

There is . . . a point beyond which frequent overruling would overtax the country's belief in the Court's good faith. Despite the variety of reasons that may inform and justify a decision to overrule, we cannot forget that such a decision is usually perceived (and perceived correctly) as, at the least, a statement that a prior decision was wrong. There is a limit to the amount of error that can plausibly be imputed to prior Courts. If that limit should be exceeded, disturbance of prior rulings would be taken as evidence that justifiable reexamination of principle had given way to drives for particular results in the short term.

Buffalo City Metropolitan Authority c. Asla Construction (Pty) Ltd., [2019] Z.A.C.C. 15, 2019 (4) S.A. 331, par. 65).

[260] Les vertus de l'application de la règle du *stare decisis* par une juridiction du même degré sont largement reconnues. La doctrine [TRADUCTION] « favorise le développement uniforme, prévisible et cohérent des principes de droit, favorise la confiance envers les décisions judiciaires et contribue à l'intégrité, réelle et perçue, du processus judiciaire » (*Kimble*, p. 2409, citant *Payne c. Tennessee*, 501 U.S. 808 (1991), p. 827). Notre Cour a reconnu l'importance que revêt la règle du *stare decisis* pour assurer la « certitude du droit » (*Canada (Procureur général) c. Bedford*, [2013] 3 R.C.S. 1101, par. 38; *R. c. Bernard*, [1988] 2 R.C.S. 833, p. 849; *Ministre des Affaires indiennes et du Nord c. Ranville*, [1982] 2 R.C.S. 518, p. 527). D'autres cours ont qualifié la règle du *stare decisis* de [TRADUCTION] « pierre d'assise de la primauté du droit » (*Michigan c. Bay Mills Indian Community*, 572 U.S. 782 (2014), p. 798; *Kimble*, p. 2409; *Kisor*, p. 2422; voir également *Camps Bay*, p. 55-56; Jeremy Waldron, « *Stare Decisis* and the Rule of Law : A Layered Approach » (2012), 111 *Mich. L. Rev.* 1, p. 28; Lewis F. Powell, Jr., « *Stare Decisis* and Judicial Restraint » (1990), 47 *Wash. & Lee L. Rev.* 281, p. 288).

[261] Le respect des précédents préserve également la légitimité institutionnelle de notre Cour. Les décisions de notre Cour ne perdent pas leur valeur de précédent « avec le départ de l'un ou de plusieurs des juges qui y ont participé » (*Plourde c. Wal-Mart Canada Corp.*, [2009] 3 R.C.S. 465, par. 13). Des idées similaires ont été évoquées dans la jurisprudence américaine :

[TRADUCTION] Au-delà d'un certain point, si la Cour infirme fréquemment ses décisions, sa bonne foi risque d'être mise en doute. Malgré les différentes raisons pouvant permettre de comprendre et de justifier une décision d'écarter un jugement précédent, il ne faut pas oublier que cette décision est habituellement perçue — à juste titre — comme, à tout le moins, une affirmation du fait qu'une décision antérieure était erronée. Il y a une limite aux erreurs qui peuvent vraisemblablement être imputées aux tribunaux ayant siégé avant la formation actuelle. Si cette limite devait être franchie, la modification d'une décision précédente

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The legitimacy of the Court would fade with the frequency of its vacillation.

(*Planned Parenthood of Southeastern Pennsylvania v. Casey, Governor of Pennsylvania*, 505 U.S. 833 (1992), at p. 866; see also *Florida Department of Health and Rehabilitative Services v. Florida Nursing Home Association*, 450 U.S. 147 (1981), at p. 153, per Stevens J., concurring.)

[262] Several scholars have made this point as well (see e.g., Michael J. Gerhardt, *The Power of Precedent* (2008), at p. 18; Garner et al., at p. 391). Aharon Barak has warned that

overruling precedent damages the public's conception of the judicial role, and undermines the respect in which the public holds the courts and its faith in them. Precedent should not resemble a ticket valid only for the day of purchase.

("Overruling Precedent" (1986), 21 *Is.L.R.* 269, at p. 275)

[263] The majority's reasons, in our view, disregard the high threshold required to overturn one of this Court's decisions. The justification for the majority abandoning this Court's long-standing view of how statutory appeal clauses impact the standard of review analysis is that this Court's approach was "unsound in principle" and criticized by judges and academics. The majority also suggests that the Court's decisions set up an "unworkable and unnecessarily complex" system of judicial review. Abandoning them, the majority argues, would promote the values underlying *stare decisis*, namely "clarity and certainty in the law". In doing so, the majority discards several of this Court's bedrock administrative law principles.

[264] The majority leaves unaddressed the most significant rejection of this Court's jurisprudence

serait considérée comme une preuve du fait que le réexamen légitime de principes a cédé devant la volonté d'obtenir un résultat particulier à court terme. La Cour perdrait de sa légitimité en raison de la fréquence de ses hésitations.

(*Planned Parenthood of Southeastern Pennsylvania c. Casey, Governor of Pennsylvania*, 505 U.S. 833 (1992), p. 866; voir également *Florida Department of Health and Rehabilitative Services c. Florida Nursing Home Association*, 450 U.S. 147 (1981), p. 153, motifs concordants du juge Stevens.)

[262] Plusieurs universitaires ont exprimé un point de vue semblable (voir, p. ex., Michael J. Gerhardt, *The Power of Precedent* (2008), p. 18; Garner et autres, p. 391). Selon Aharon Barak,

[TRADUCTION] l'abandon d'un précédent ternit la perception qu'a le public du rôle de la magistrature et mine son respect et sa confiance envers elle. Le précédent ne devrait pas ressembler à un billet valide le jour de l'achat seulement.

(« Overruling Precedent » (1986), 21 *Is.L.R.* 269, p. 275)

[263] À notre avis, les motifs de la majorité ne tiennent pas compte du critère rigoureux auquel il faut satisfaire pour pouvoir écarter l'une des décisions de notre Cour. La majorité justifie son abandon de la conception bien établie de notre Cour quant à l'effet des dispositions législatives créant un droit d'appel sur l'analyse de la norme de contrôle en affirmant que cette approche était « non fondé[e] en principe » et qu'elle avait fait l'objet de critiques tant de la part des juges que des auteurs. La majorité avance aussi l'idée que les décisions de notre Cour ont établi un système de contrôle judiciaire « inapplicable et indûment complexe ». De l'avis de la majorité, l'abandon de ces décisions irait de pair avec les valeurs qui sous-tendent la doctrine du *stare decisis*, soit « la clarté et [. . .] la certitude du droit ». Ce faisant, la majorité ne tient pas compte de plusieurs des principes fondamentaux établis par notre Cour en droit administratif.

[264] La majorité n'explique pas dans ses motifs l'aspect le plus important de son rejet de la

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in its reasons — its decision to change the entire "conceptual basis" for judicial review by excluding specialization, expertise and other institutional advantages from the analysis. The lack of any justification for this foundational shift — repeatedly invoked by the majority to sanitize further overturning of precedent — undercuts the majority's stated respect for *stare decisis* principles.

[265] The majority explains its decision to overrule the Court's prior decisions about appeal clauses by asserting that these precedents had "no satisfactory justification". It does not point, however, to any arguments different from those heard and rejected by other panels of this Court over the decades whose decisions are being discarded. Instead, the majority substitutes its own preferred approach to interpreting statutory rights of appeal — an approach rejected by several prior panels of this Court in a line of decisions stretching back three decades. The rejection of such an approach was explicitly reaffirmed *no fewer than four times in the past ten years* (*Khosa*, at para. 26; *Mowat*, at paras. 30-31; *Mouvement laïque*, at para. 38; *Edmonton East*, at paras. 27-31; see also *McLean*, at para. 21).

[266] Overruling these judgments flouts *stare decisis* principles, which prohibit courts from overturning past decisions which "simply represen[t] a preferred choice with which the current Bench does not agree" (*Couch*, at para. 105; see also *Knauer*, at para. 22; *Casey*, at p. 864). "[T]he entire idea of *stare decisis* is that judges do not get to reverse a decision just because they never liked it in the first instance" (*Knick v. Township of Scott, Pennsylvania*, 139 S. Ct. 2162 (2019), at p. 2190, per Kagan J., dissenting). As the United States Supreme Court noted in *Kimble*:

> . . . an argument that we got something wrong — even a good argument to that effect — cannot by itself justify scrapping settled precedent. Or otherwise said, it is not

jurisprudence de notre Cour, à savoir sa décision de modifier tout le « fondement conceptuel » du contrôle judiciaire en excluant de l'analyse la spécialisation, l'expertise et d'autres avantages institutionnels. L'absence totale de raisons justifiant ce revirement majeur — que la majorité invoque à maintes reprises pour racheter l'abandon de précédents — décrédibilise ses affirmations quant à son respect des principes du *stare decisis*.

[265] La majorité explique sa décision d'écarter les jugements antérieurs de notre Cour portant sur des dispositions législatives créant un droit d'appel en affirmant que « rien ne saurait justifier [ces jugements] de façon satisfaisante ». Elle n'avance toutefois aucun argument différent de ceux qu'ont entendus et rejetés pendant des décennies d'autres formations de notre Cour dont les décisions sont aujourd'hui écartées. La majorité remplace plutôt cette jurisprudence constante par l'approche qu'elle privilégie en matière d'interprétation des droits d'appel conférés par la loi — approche qui a été rejetée par plusieurs formations antérieures de notre Cour dans une série de décisions qui s'étirent sur trois décennies et qui ont été confirmées de manière explicite *pas moins de quatre fois au cours des dix dernières années* (*Khosa*, par. 26; *Mowat*, par. 30-31; *Mouvement laïque*, par. 38; *Edmonton East*, par. 27-31; voir également *McLean*, par. 21).

[266] L'abandon de ces jugements bafoue les principes du *stare decisis* qui interdisent aux cours d'écarter des décisions antérieures qui [TRADUCTION] « représentent simplement une solution antérieurement retenue à laquelle la formation actuelle ne souscrit pas » (*Couch*, par. 105; voir aussi *Knauer*, par. 22; *Casey*, p. 864). [TRADUCTION] « [L]e principe du *stare decisis* tient à l'idée que les juges ne devraient pas pouvoir infirmer une décision pour la seule et unique raison qu'ils ne l'ont jamais aimé au départ » (*Knick c. Township of Scott, Pennsylvania*, 139 S. Ct. 2162 (2019), p. 2190, motifs dissidents de la juge Kagan). Ainsi que la Cour suprême des États-Unis l'a souligné dans l'arrêt *Kimble* :

> [TRADUCTION] . . . l'argument selon lequel quelque chose nous a échappé — si valable soit-il — ne saurait à lui seul justifier l'abandon d'un précédent établi. En d'autres mots,

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alone sufficient that we would decide a case differently now than we did then. To reverse course, we require as well what we have termed a "special justification" — over and above the belief "that the precedent was wrongly decided." [Citation omitted; p. 2409.]

[267] But it is the unprecedented wholesale rejection of an entire body of jurisprudence that is particularly unsettling. The affected cases are too numerous to list in full here. It includes many decisions conducting deferential review even in the face of a statutory right of appeal (*Pezim*; *Southam*; *Committee for Equal Treatment of Asbestos Minority Shareholders v. Ontario (Securities Commission)*, [2001] 2 S.C.R. 132; *Dr. Q*; *Ryan*; *Cartaway*; *VIA Rail*; *Association des courtiers et agents immobiliers du Québec v. Proprio Direct inc.*, [2008] 2 S.C.R. 195; *Nolan v. Kerry (Canada) Inc.*, [2009] 2 S.C.R. 678; *McLean*; *Bell Canada (2009)*; *ATCO Gas*; *Mouvement laïque*; *Igloo Vikski*; *Edmonton East*) and bedrock judgments affirming the relevance of administrative expertise to the standard of review analysis and to "home statute" deference (*C.U.P.E.*; *National Corn Growers*; *Domtar Inc.*; *Bradco Construction*; *Southam*; *Pushpanathan*; *Alberta Teachers' Association*; *Canadian Human Rights Commission*, among many others).

[268] Most of those decisions were decided unanimously or by strong majorities. At no point, however, does the majority acknowledge this Court's strong reluctance to overturn precedents that "represen[t] the considered views of firm majorities" (*Craig*, at para. 24; *Ontario (Attorney General) v. Fraser*, [2011] 2 S.C.R. 3, at para. 57; see also *Nishi v. Rascal Trucking Ltd.*, [2013] 2 S.C.R. 438, at paras. 23-24), or to overrule decisions of a "recent vintage" (*Fraser*, at para. 57; see also *Nishi*, at para. 23). The decisions the majority *does* rely on, by contrast, involved overturning usually only one precedent and almost always an older one: *Craig* overruled a

il ne suffit pas de dire que nous en arriverions à une décision différente de celle que nous avions prise à l'époque. Pour faire marche arrière, nous devons également pouvoir invoquer ce que nous avons appelé une « justification spéciale » — qui est plus que la simple conviction que « la décision précédente était erronée ». [Référence omise; p. 2409.]

[267] Cependant, c'est le rejet en bloc sans précédent de tout un arsenal jurisprudentiel qui est particulièrement troublant. Les arrêts touchés sont trop nombreux pour qu'on en dresse la liste ici. Au nombre de ceux-ci figurent de nombreuses décisions rendues aux termes d'un contrôle fondé sur la déférence en dépit de l'existence d'un droit d'appel conféré par la loi (*Pezim*; *Southam*; *Comité pour le traitement égal des actionnaires minoritaires de la Société Asbestos Ltée c. Ontario (Commission des valeurs mobilières)*, [2001] 2 R.C.S. 132; *Dr. Q*; *Ryan*; *Cartaway*; *VIA Rail*; *Association des courtiers et agents immobiliers du Québec c. Proprio Direct inc.*, [2008] 2 R.C.S. 195; *Nolan c. Kerry (Canada) Inc.*, [2009] 2 R.C.S. 678; *McLean*; *Bell Canada (2009)*; *ATCO Gas*; *Mouvement laïque*; *Igloo Vikski*; *Edmonton East*), ainsi que des arrêts fondamentaux confirmant la pertinence de l'expertise administrative tant pour l'analyse de la norme de contrôle que pour la déférence envers l'interprétation donnée par les tribunaux administratifs à leur « loi constitutive » (voir *S.C.F.P.*; *National Corn Growers*; *Domtar Inc.*; *Bradco Construction*; *Southam*; *Pushpanathan*; *Alberta Teachers' Association*; *Commission canadienne des droits de la personne*, parmi tant d'autres).

[268] La plupart de ces décisions ont été rendues par des formations unanimes ou par de fortes majorités. Cependant, la majorité ne reconnaît nulle part en l'espèce la grande réticence de notre Cour à renverser des précédents qui « exprime[nt] l'avis réfléchi de majorités claires » (*Craig*, par. 24; *Ontario (Procureur général) c. Fraser*, [2011] 2 R.C.S. 3, par. 57; voir également *Nishi c. Rascal Trucking Ltd.*, [2013] 2 R.C.S. 438, par. 23 et 24), ou des décisions à « caractère récent » (*Fraser*, par. 57; voir également *Nishi*, par. 23). En revanche, les décisions sur lesquelles s'appuie la majorité concernaient des situations dans lesquelles un seul précédent avait

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34-year-old precedent; *R. v. Henry*, [2005] 3 S.C.R. 609, overruled a 19-year-old precedent (and another 15-year-old precedent, in part); and the dissenting judges in *Bernard* would have overruled a 10-year-old precedent.

[269] The majority's decision to overturn precedent also has the potential to disturb settled interpretations of many statutes that contain a right of appeal. Under the majority's approach, every existing interpretation of such statutes by an administrative body that has been affirmed under a reasonableness standard of review will be open to fresh challenge. In *McLean*, for example, this Court acknowledged that a limitations period in British Columbia's *Securities Act*[6] had two reasonable interpretations, but deferred to the one the Commission preferred based on deferential review. We see no reason why an individual in the same situation as Ms. McLean could not now revisit our Court's decision through the statutory right of appeal in the *Securities Act*, and insist that a new reviewing court offer *its* definitive view of the relevant limitations period now that appeal clauses are interpreted to permit judicial substitution rather than deference.

[270] The majority does not address the chaos that such legal uncertainty will generate for those who rely on settled interpretations of administrative statutes to structure their affairs, despite the fact that protecting these reliance interests is a well-recognized and especially powerful reason for respecting precedent (Garner et al., at pp. 404-11; Neil Duxbury, *The Nature and Authority of Precedent* (2008), at pp. 118-19; *Kimble*, at pp. 2410-11). By changing the entire status quo, the majority's approach will undermine legal certainty — "the foundational principle

[6] R.S.B.C. 1996, c. 418, s. 159.

été écarté et, le plus souvent, une décision plus ancienne; l'arrêt *Craig* infirme une décision remontant à 34 ans; l'arrêt *R. c. Henry*, [2005] 3 R.C.S. 609, infirme une décision remontant à 19 ans (et une autre, écartée en partie, remontant à 15 ans), et, dans l'arrêt *Bernard*, les juges dissidents auraient infirmé une décision rendue une dizaine d'années plus tôt.

[269] La décision de la majorité de renverser une jurisprudence risque également de bousculer les interprétations établies de nombreuses lois prévoyant un droit d'appel. Suivant l'approche de la majorité, chaque interprétation existante de ces lois par un organisme administratif qui a été confirmée en appliquant la norme de contrôle de la décision raisonnable sera susceptible d'être remise en question. Par exemple, dans l'arrêt *McLean*, notre Cour a reconnu qu'un délai de prescription prévu par la *Securities Act*[6] de la Colombie-Britannique se prêtait à deux interprétations valables, mais elle a retenu celle que la Commission privilégiait, en procédant à un contrôle empreint de déférence. Nous ne voyons aucune raison qui empêcherait une personne se trouvant dans la même situation que M^me^ McLean de solliciter le réexamen de la décision de notre Cour en exerçant le droit d'appel accordé par la *Securities Act* et en demandant avec insistance à une cour de cours de révision d'offrir *sa propre* interprétation définitive du délai de prescription pertinent, dès lors que les dispositions législatives conférant un droit d'appel sont désormais interprétées de façon à permettre aux cours de substituer leur décision à celle qu'ils examinent plutôt que de procéder au contrôle de cette décision selon le principe de la déférence.

[270] La majorité ne propose aucune solution pour contrer le chaos que cette incertitude juridique engendrerait pour celles et ceux qui se fient aux interprétations établies des lois administratives pour organiser leurs affaires, même si la nécessité de protéger ses intérêts liés à une confiance raisonnable constitue une raison particulièrement impérieuse et bien reconnue de respecter les précédents (Garner et autres, p. 404-411; Neil Duxbury, *The Nature and Authority of Precedent* (2008), p. 118-119; *Kimble*, p. 2410-2411). En modifiant complètement le *statu*

[6] R.S.B.C. 1996, c. 418, art. 159.

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upon which the common law relies" (*Bedford*, at para. 38; see also Cromwell, at p. 315).

[271] Moreover, if this Court had for over 30 years significantly misconstrued the purpose of statutory appeal routes by failing to recognize what *this* majority has ultimately discerned — that in enacting such routes, legislatures were unequivocally directing courts to review *de novo* every question of law that an administrative body addresses, regardless of that body's expertise — legislatures across Canada were free to clarify this interpretation and endorse the majority's favoured approach through legislative amendment. Given the possibility — and continued absence — of legislative correction, the case for overturning our past decisions is even less compelling (*Binus v. The Queen*, [1967] S.C.R. 594, at p. 601; see also *Kimble*, at p. 2409; *Kisor*, at pp. 2422-23; *Bilski v. Kappos*, *Under Secretary of Commerce for Intellectual Property and Director, Patent and Trademark Office*, 561 U.S. 593 (2010), at pp. 601-2).

[272] Each of these rationales for adhering to precedent — consistent affirmation, reliance interests and the possibility of legislative correction — was recently endorsed by the United States Supreme Court in *Kisor*. There, the Court invoked *stare decisis* to uphold two administrative law precedents which urged deference to administrative agencies when they interpreted ambiguous provisions in their regulations (*Bowles, Price Administrator v. Seminole Rock & Sand Co.*, 325 U.S. 410 (1945); *Auer v. Robbins*, 519 U.S. 452 (1997)). Writing for the majority on the issue of *stare decisis*, Justice Kagan explained at length why the doctrine barred the Court from overturning *Auer* or *Seminole Rock*. To begin, Justice Kagan reiterated the importance of *stare decisis* and the need for special justification to overcome its demands. She then explained that *stare decisis* carried even greater force than usual when applied to two decisions that had been affirmed by a "long line of precedents" going back 75 years or more and cited by

quo, l'approche de la majorité porte un dur coup au principe de la « certitude du droit », soit « l'assise fondamentale de la common law » (*Bedford*, par. 38; voir aussi Cromwell, p. 315).

[271] Par ailleurs, si notre Cour s'était, pendant plus d'une trentaine d'années, méprise fortement sur l'objet des voies d'appel prévues par la loi en ne reconnaissant pas ce que la majorité *en l'espèce* a finalement saisi — c'est-à-dire le fait qu'en adoptant ces mécanismes, le législateur confiait sans équivoque aux cours de justice le mandat de procéder à un examen *de novo* de chaque question de droit dont traite un organisme administratif, indépendamment de l'expertise de cet organisme —, il aurait alors été loisible aux législatures de l'ensemble du Canada de clarifier cette interprétation et d'adopter l'approche privilégiée par la majorité au moyen d'une modification législative. Étant donné la possibilité — et l'absence continue — d'intervention du législateur, les arguments militant en faveur du renversement de nos décisions antérieures sont encore moins convaincants (*Binus c. The Queen*, [1967] R.C.S. 594, p. 601; voir également *Kimble*, p. 2409; *Kisor*, p. 2422-2423; *Bilski c. Kappos, Under Secretary of Commerce for Intellectual Property and Director, Patent and Trademark Office*, 561 U.S. 593 (2010), p. 601-602).

[272] La Cour suprême des États-Unis, dans l'arrêt *Kisor*, a récemment approuvé chacune des raisons invoquées pour respecter les précédents : la constance, les intérêts liés à la confiance raisonnable et la possibilité d'intervention législative. Dans cet arrêt, la Cour a invoqué la règle du *stare decisis* pour confirmer deux précédents en matière de droit administratif qui exhortaient les cours de révision à faire preuve de déférence à l'égard de l'interprétation, par les organismes administratifs, de dispositions ambiguës de leurs règlements (*Bowles, Price Administrator c. Seminole Rock & Sand Co.*, 325 U.S. 410 (1945); *Auer c. Robbins*, 519 U.S. 452 (1997)). S'exprimant au nom de la majorité sur la question de la règle du *stare decisis*, la juge Kagan a expliqué en long et en large les raisons pour lesquelles la doctrine empêchait la Cour d'infirmer les arrêts *Auer* et *Seminole Rock*. D'abord, elle a rappelé l'importance de la règle du *stare decisis* et la nécessité d'établir une justification spéciale permettant d'outrepasser ses

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lower courts thousands of times (p. 2422). She noted that overturning the challenged precedents would cast doubt on many settled statutory interpretations and invite relitigation of cases (p. 2422). Finally, Justice Kagan reasoned that Congress remained free to overturn the cases if the Court had misconstrued legislative intent:

> . . . even if we are wrong about *Auer*, "Congress remains free to alter what we have done." In a constitutional case, only we can correct our error. But that is not so here. Our deference decisions are "balls tossed into Congress's court, for acceptance or not as that branch elects." And so far, at least, Congress has chosen acceptance. It could amend the APA or any specific statute to require the sort of *de novo* review of regulatory interpretations that Kisor favors. Instead, for approaching a century, it has let our deference regime work side-by-side with both the APA and the many statutes delegating rulemaking power to agencies. It has done so even after we made clear that our deference decisions reflect a presumption about congressional intent. And it has done so even after Members of this Court began to raise questions about the doctrine. Given that history — and Congress's continuing ability to take up Kisor's arguments — we would need a particularly "special justification" to now reverse *Auer*. [Citations omitted; pp. 2422-23.]

[273] In the face of these compelling reasons for adhering to precedent, many of which have found resonance in this Court's jurisprudence, the majority's reliance on "judicial and academic criticism" falls far short of overcoming the demands of *stare decisis*. It is hard to see why the *obiter* views of the handful of Canadian judges referred to by the majority should be determinative or even persuasive. The majority omits the views of any academics or judges who *have*

exigences. Elle a ensuite expliqué que la règle du *stare decisis* revêtait encore plus d'importance que d'habitude lorsqu'elle s'appliquait à deux décisions confirmées par [TRADUCTION] « une jurisprudence constante » remontant à au moins 75 ans et qui avait par ailleurs été citée des milliers de fois par des juridictions inférieures (p. 2422). Elle a ajouté que l'abandon des précédents contestés soulèverait des doutes quant à une foule d'interprétations législatives établies et favoriserait la remise en question des décisions (p. 2422). Enfin, la juge Kagan a fait remarquer qu'il était loisible au Congrès d'annuler la jurisprudence si la Cour avait mal interprété l'intention du législateur :

> [TRADUCTION] . . . même si nous avons tort au sujet de l'arrêt *Auer*, « il est toujours loisible au Congrès de modifier notre décision ». En matière constitutionnelle, seule notre Cour peut corriger ses erreurs. Cependant, telle n'est pas la situation qui se présente en l'espèce. Lorsque nous optons pour la retenue à l'égard d'une décision, la balle est dans le camp du Congrès, qui est libre d'accepter ou non notre décision. Jusqu'à maintenant du moins, le Congrès a choisi de l'accepter. Il aurait pu modifier l'APA ou une loi spécifique afin d'exiger le type de contrôle *de novo* des interprétations des règlements que Kisor privilégie. Or, pendant près d'un siècle, le Congrès a plutôt permis que notre régime axé sur la déférence fonctionne de pair avec l'APA et les nombreuses lois qui délèguent un pouvoir de réglementation à des organismes administratifs. Le Congrès a continué d'agir ainsi même après que nous eûmes précisé que nos décisions en matière de déférence traduisaient une présomption concernant l'intention du Congrès, et même après que des juges de notre Cour eurent commencé à exprimer des doutes au sujet de la doctrine. Compte tenu de ce passé — et de la possibilité qui s'offre encore au Congrès de reprendre les arguments de Kisor —, nous aurions besoin d'une « justification spéciale » particulièrement importante pour écarter maintenant l'arrêt *Auer*. [Références omises; p. 2422-2423.]

[273] Au vu de ces raisons impérieuses de respecter les précédents, dont bon nombre ont trouvé écho dans la jurisprudence de notre Cour, l'argument des « critiques judiciaires et doctrinales » invoqué par la majorité est très loin de supplanter les exigences de la règle du *stare decisis*. Il est difficile de comprendre pourquoi les remarques incidentes de quelques juges canadiens citées par la majorité devraient être déterminantes, ou même convaincantes. La majorité

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voiced support for a strong presumption of deference without identifying our approach to statutory rights of appeal as cause for concern (Dyzenhaus, "Dignity in Administrative Law: Judicial Deference in a Culture of Justification", at p. 109; Green, at pp. 489-90; Matthew Lewans, *Administrative Law and Judicial Deference* (2016); Jonathan M. Coady, "The Time Has Come: Standard of Review in Canadian Administrative Law" (2017), 68 *U.N.B.L.J.* 87; the Hon. John M. Evans, "Standards of Review in Administrative Law" (2013), 26 *C.J.A.L.P.* 67, at p. 79; the Hon. John M. Evans, "Triumph of Reasonableness: But How Much Does It Really Matter?" (2014), 27 *C.J.A.L.P.* 101; Jerry V. DeMarco, "Seeking Simplicity in Canada's Complex World of Judicial Review" (2019), 32 *C.J.A.L.P.* 67).

[274] A selective assortment of criticism is not evidence of generalized criticism or unworkability. This Court frequently tackles contentious, high-profile cases that engender strong and persisting divisions of opinion. The public looks to us to definitively resolve those cases, regardless of the composition of the Court. As Hayne J. noted in *Lee*:

To regard the judgments of this Court as open to reconsideration whenever a new argument is found more attractive than the principle expressed in a standing decision is to overlook the function which a final court of appeal must perform in defining the law. In difficult areas of the law, differences of legal opinion are inevitable; before a final court of appeal, the choice between competing legal solutions oftentimes turns on the emphasis or weight given by each of the judges to one factor against a countervailing factor. . . . *In such cases, the decision itself determines which solution is, for the purposes of the current law, correct*. It is not to the point to argue in the next case that, leaving the particular decision out of account, another solution is better supported by legal theory. *Such an approach would diminish the authority and finality of the judgments of this Court.* As the function of defining the law is vested in the Court rather than in the justices who compose it, a decision of the Court will be followed in

passe sous silence l'avis des juges et des universitaires qui *se sont* prononcés en faveur de l'existence d'une forte présomption d'application de la norme de la décision raisonnable, sans dire que notre vision des droits d'appel statutaires a de quoi inquiéter (Dyzenhaus, « Dignity in Administrative Law : Judicial Deference in a Culture of Justification », p. 109; Green, p. 489-490; Matthew Lewans, *Administrative Law and Judicial Deference* (2016); Jonathan M. Coady, « The Time Has Come : Standard of Review in Canadian Administrative Law » (2017), 68 *R.D. U.N.-B.* 87; Cromwell, « What I Think I've Learned About Administrative Law », p. 314-316; l'hon. John M. Evans, « Standards of Review in Administrative Law » (2013), 26 *R.C.D.A.P.* 67, p. 79; l'hon. John M. Evans, « Triumph of Reasonableness : But How Much Does It Really Matter? » (2014), 27 *R.C.D.A.P.* 101; Jerry V. DeMarco, « Seeking Simplicity in Canada's Complex World of Judicial Review » (2019), 32 *R.C.D.A.P.* 67).

[274] Un assortiment sélectif de critiques ne constitue pas une preuve de critiques généralisées ou d'inapplicabilité. Notre Cour est fréquemment appelée à statuer sur des affaires très contestées et médiatisées qui donnent lieu à des divergences d'opinions marquées et persistantes. Le public s'en remet à nous pour trancher définitivement ces litiges, peu importe la composition de la Cour. Ainsi que l'a expliqué le juge Hayne dans l'arrêt *Lee* :

[TRADUCTION] Dire que les jugements de notre Cour sont susceptibles de réexamen chaque fois qu'un nouvel argument est jugé plus intéressant que le principe exposé dans une décision précédente revient à occulter le rôle que doit jouer un tribunal d'appel de dernier ressort appelé à définir le droit. Lorsqu'il s'agit de domaines de droit complexes, les divergences d'opinions juridiques sont inévitables; devant un tribunal d'appel de dernier ressort, le choix entre des solutions juridiques opposées dépend dans bien des cas de l'importance que chacun des juges accorde à un facteur plutôt qu'à un autre. [. . .] *En pareil cas, la décision elle-même permet de déterminer laquelle des solutions est la bonne, eu égard à l'état actuel du droit*. Il n'est pas utile de soutenir ultérieurement que, si l'on fait abstraction de la décision en cause, une autre solution bénéficie d'appuis plus solides dans la doctrine. *Cette approche saperait l'autorité et le caractère définitif des jugements de notre Cour.* Étant donné qu'il appartient

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subsequent cases by the Court, however composed, subject to the exceptional power which resides in the Court to permit reconsideration.

Accordingly, as one commentator has put the point: "the previous decision is to be treated as the primary premise from which other arguments follow, and not just as one potential premise among an aggregate of competing premises". [Emphasis in original; footnote omitted.]

(paras. 65-66, citing *Baker v. Campbell* (1983), 153 C.L.R. 52 (H.C.A.), at pp. 102-3.)

[275] This Court, in fact, has been clear that "criticism of a judgment is not sufficient to justify overruling it" (*Fraser*, at para. 86). Differences of legal and public opinion are a natural by-product of contentious cases like *R. v. Jordan*, [2016] 1 S.C.R. 631, or even *Housen*, which, as this Court acknowledged, was initially applied by appeal courts with "varying degrees of enthusiasm" (*H.L. v. Canada (Attorney General)*, [2005] 1 S.C.R. 401, at para. 76; see also Paul M. Perell, "The Standard of Appellate Review and The Ironies of Housen v. Nikolaisen" (2004), 28 *Adv. Q.* 40, at p. 53; Mike Madden, "Conquering the Common Law Hydra: A Probably Correct and Reasonable Overview of Current Standards of Appellate and Judicial Review" (2010), 36 *Adv. Q.* 269, at pp. 278-79 and 293; Paul J. Pape and John J. Adair, "Unreasonable review: The losing party and the palpable and overriding error standard" (2008), 27 *Adv. J.* 6, at p. 8; Geoff R. Hall, "Two Unsettled Questions in the Law of Contractual Interpretation: A Call to the Supreme Court of Canada" (2011), 50 *Can. Bus. L.J.* 434, at p. 436).

[276] To justify circumventing this Court's jurisprudence, the majority claims that the precedents being overturned *themselves* departed from the approach to statutory rights of appeal under the pragmatic and functional test. That, with respect, is wrong. Ever since *Bell Canada (1989)* and in several subsequent decisions outlined earlier in these reasons, statutory rights of appeal have played little or no role in the standard of review analysis. Moreover, in pre-*Dunsmuir* cases, statutory rights of appeal were still seen as only one

à la Cour, plutôt qu'aux juges qui la composent, de définir le droit, ses décisions seront suivies dans les affaires subséquentes portées à son attention, quelle que soit sa composition, sous réserve du pouvoir exceptionnel de la Cour d'en permettre le réexamen.

En conséquence, comme un auteur l'a souligné, « la décision précédente doit être considérée comme la prémisse de base dont découleront d'autres arguments, et non simplement comme une prémisse possible parmi un ensemble de prémisses opposées ». [En italique dans l'original; note en bas de page omise.]

(par. 65-66, citant *Baker c. Campbell* (1983), 153 C.L.R. 52 (H.C.A.), p. 102-103.)

[275] Notre Cour a en fait mentionné clairement que « la critique d'un jugement ne saurait justifier son renversement » (*Fraser*, par. 86). Les divergences d'opinions d'ordre juridique et public découlent naturellement d'arrêts litigieux tels que *R. c. Jordan*, [2016] 1 R.C.S. 631, ou même *Housen*, qui, comme la reconnu notre Cour, avait été appliqué au départ par les cours d'appel avec « un enthousiasme variable » (*H.L. c. Canada (Procureur général)*, [2005] 1 R.C.S. 401, par. 76; voir aussi Paul M. Perell, « The Standard of Appellate Review and the Ironies of Housen v. Nikolaisen » (2004), 28 *Adv. Q.* 40, p. 53; Mike Madden, « Conquering the Common Law Hydra : A Probably Correct and Reasonable Overview of Current Standards of Appellate and Judicial Review » (2010), 36 *Adv. Q.* 269, p. 278-279 et 293; Paul J. Pape et John J. Adair, « Unreasonable Review : The Losing Party and the Palpable and Overriding Error Standard » (2008), 27 *Adv. J.* 6, p. 8; Geoff R. Hall, « Two Unsettled Questions in the Law of Contractual Interpretation : A Call to the Supreme Court of Canada » (2011), 50 *Rev. can. dr. comm.* 434, p. 436).

[276] Pour justifier le fait de contourner la jurisprudence de notre Cour, la majorité prétend que les précédents renversés s'écartent *eux-mêmes* de la manière dont l'analyse pragmatique et fonctionnelle aborde les droits d'appel conférés par la loi. Avec égards, cette affirmation est inexacte. Depuis l'arrêt *Bell Canada (1989)* et dans plusieurs décisions subséquentes décrites précédemment dans les présents motifs, les droits d'appel accordés par la loi ne sont presque pas ou pas du tout entrés en ligne de compte

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factor among others — and *not* as unequivocal indicators of correctness review (see, for example, *Canada (Deputy Minister of National Revenue) v. Mattel Canada Inc.*, [2001] 2 S.C.R. 100, at paras. 27-33; *Chieu v. Canada (Minister of Citizenship and Immigration)*, [2002] 1 S.C.R. 84, at paras. 23-24; *Harvard College v. Canada (Commissioner of Patents)*, [2002] 4 S.C.R. 45, at paras. 149-51). Our pre- and post-*Dunsmuir* cases on statutory rights of appeal shared in common an unwavering commitment to determining the standard of review in administrative proceedings using administrative law principles, even when appeal rights were involved.

[277] For the majority, the elimination of the contextual factors appears to have justified the reconstruction of the whole judicial review framework. Yet the elimination of the contextual analysis was all but complete in our post-*Dunsmuir* jurisprudence, and does not support the foundational changes to judicial review in the majority's decision. Neither that development, nor the majority's assertion that our precedents have proven "unclear and unduly complex", justifies the conclusion that *all* of our administrative law precedents — even those unconnected to the practical difficulties in applying *Dunsmuir* — are suddenly fair game.

[278] This Court is overturning a long line of well-established and recently-affirmed precedents in a whole area of law, including several unanimous or strong majority judgments. There is no principled justification for such a dramatic departure from this Court's existing jurisprudence.

dans l'analyse relative à la norme de contrôle. De surcroît, dans les arrêts antérieurs à *Dunsmuir*, les droits d'appel conférés par la loi n'étaient encore perçus que comme un facteur parmi d'autres et *non* comme des indices sans équivoque d'un contrôle selon la norme de la décision correcte (voir, par exemple, *Canada (Sous-ministre du Revenu national) c. Mattel Canada Inc.*, [2001] 2 R.C.S. 100, par. 27-33; *Chieu c. Canada (Ministre de la Citoyenneté et de l'Immigration)*, [2002] 1 R.C.S. 84, par. 23-24; *Harvard College c. Canada (Commissaire aux brevets)*, [2002] 4 R.C.S. 45, par. 149-151). Tant nos décisions qui ont précédé l'arrêt *Dunsmuir* que celles qui l'ont suivi sur les droits d'appel conférés par la loi ont eu en commun l'engagement indéfectible à déterminer la norme de contrôle applicable dans une instance administrative au moyen des principes de droit administratif, même lorsque les droits d'appel entrent en jeu.

[277] Pour la majorité, l'élimination des facteurs contextuels semble justifier un remaniement de fond en comble de l'ensemble du cadre d'analyse du contrôle judiciaire. Pourtant, l'élimination de l'analyse contextuelle était pratiquement achevée dans notre jurisprudence post-*Dunsmuir* et elle ne justifie pas les modifications fondamentales apportées au contrôle judiciaire par les juges majoritaires. Ni ces changements ni l'affirmation de la majorité selon laquelle notre jurisprudence n'est « pas clair[e] et [est] indûment complex[e] » ne permettent du jour au lendemain d'affirmer qu'on peut légitimement remettre en question *toutes* les décisions que nous avons rendues en droit administratif — même celles qui n'ont rien à voir avec les problèmes d'ordre pratique engendrés par l'application de l'arrêt *Dunsmuir*.

[278] Notre Cour provoque ainsi un revirement jurisprudentiel qui concerne l'ensemble d'un domaine du droit en écartant une longue série de précédents bien établis et récemment confirmés, dont plusieurs arrêts rendus à l'unanimité ou à forte majorité. Il n'existe aucune raison logique justifiant une rupture aussi nette avec la jurisprudence existante de la Cour.

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Going Forward

[279] In our view, a more modest approach to modifying our past decisions, one that goes no further than necessary to clarify the law and its application, is justified. "[W]hen a court does choose to overrule its own precedents, it should do so carefully, with moderation, and with due regard for all the important considerations that undergird the doctrine" (Garner et al., at pp. 41-42). Such an approach to changing precedent preserves the integrity of the judicial process and, at a more conceptual level, of the law itself as a social construct. Michael J. Gerhardt summarized this approach eloquently:

> Judicial modesty is . . . a disposition to respect precedents (as embodying the opinions of others), to learn from their and others' experiences, and to decide cases incrementally to minimize conflicts with either earlier opinions of the Court or other constitutional actors. [p. 7]

[280] Judicial modesty promotes the responsible development of the common law. Lord Tom Bingham described that process in his seminal work, *The Rule of Law* (2010):

> . . . it is one thing to move the law a little further along a line on which it is already moving, or to adapt it to accord with modern views and practices; it is quite another to seek to recast the law in a radically innovative or adventurous way, because that is to make it uncertain and unpredictable, features which are the antithesis of the rule of law. [pp. 45-46]

(See also Robert J. Sharpe, *Good Judgment: Making Judicial Decisions* (2018), at p. 93; Beverley McLachlin, "The Role of the Supreme Court of Canada in Shaping the Common Law", in Paul Daly, ed., *Apex Courts and the Common Law* (2019), 25, at p. 35; *R. v. Salituro*, [1991] 3 S.C.R. 654, at p. 670; *Friedmann Equity Developments Inc. v. Final Note Ltd.*, [2000] 1 S.C.R. 842, at para. 42; *R. v. Kang-Brown*, [2008] 1 S.C.R. 456, at paras. 14-16, per LeBel J., and 73-74, per Binnie J., concurring.)

Un regard vers l'avenir

[279] À notre avis, il y a lieu, lorsque vient le temps de modifier nos décisions antérieures, d'adopter une approche plus modeste qui ne prévoit la modification que de ce qui est nécessaire — et pas plus — pour clarifier le droit et son application. [TRADUCTION] « [L]orsqu'un tribunal choisit d'écarter ses propres précédents, il doit le faire avec prudence et modération et en tenant dûment compte de toutes les considérations importantes qui sous-tendent la doctrine » (Garner et autres, p. 41-42). Cette approche en matière de modification de la jurisprudence préserve l'intégrité du processus judiciaire et, sur un plan plus théorique, celle du droit lui-même en tant que construit social. Michael J. Gerhardt résume cette approche avec éloquence :

> [TRADUCTION] La modestie judiciaire est [. . .] une disposition à respecter les précédents (qui incarnent les opinions d'autrui), par la volonté de tirer des leçons de leur expérience et de celle des autres, et à trancher les affaires de façon progressive pour minimiser toute contradiction avec les opinions antérieures de la Cour ou d'autres acteurs constitutionnels. [p. 7]

[280] La modestie judiciaire favorise une évolution responsable de la common law. Lord Bingham a expliqué cette conception dans son ouvrage célèbre, *The Rule of Law* (2010) :

> [TRADUCTION] . . . c'est une chose de poursuivre la tendance déjà entamée par le droit ou encore d'adapter celui-ci aux perspectives et aux réalités actuelles; c'en est une autre de chercher à reformuler le droit d'une manière radicalement novatrice ou hasardeuse : on rend ainsi le droit incertain et imprévisible, des éléments qui sont l'antithèse de la primauté du droit. [p. 45-46]

(Voir également Robert J. Sharpe, *Good Judgment : Making Judicial Decisions* (2018), p. 93; Beverley McLachlin, « The Role of the Supreme Court of Canada in Shaping the Common Law », dans Paul Daly, dir., *Apex Courts and the Common Law* (2019), 25, p. 35; *R. c. Salituro*, [1991] 3 R.C.S. 654, p. 670; *Friedmann Equity Developments Inc. c. Final Note Ltd.*, [2000] 1 R.C.S. 842, par. 42; *R. c. Kang-Brown*, [2008] 1 R.C.S. 456, par. 14-16, le juge LeBel, et par. 73-74, motifs concordants du juge Binnie.)

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[281] Lord Bingham's comments highlight that a nuanced balance must be struck between maintaining the stability of the common law and ensuring that the law is flexible and responsive enough to adapt to new circumstances and shifts in societal norms. *Stare decisis* plays a critical role in maintaining that balance and upholding the rule of law. When *stare decisis* is respected, precedent acts as a stabilizing force: providing certainty as to what the law is, consistency that allows those subject to the law to order their affairs accordingly, and continuity that protects reliance on those legal consequences. *Stare decisis* is at the heart of the iterative development of the common law, fostering progressive, incremental and responsible change.

[282] So what do we suggest? We support a standard of review framework with a meaningful rule of deference, based on *both* the legislative choice to delegate decision-making authority to an administrative actor *and* on the specialized expertise that these decision-makers possess and develop in applying their mandates. Outside of the three remaining correctness categories from *Dunsmuir* — and absent clear and explicit legislative direction on the *standard* of review — administrative decisions should be reviewed for reasonableness. Like the majority, we support eliminating the category of "true questions of jurisdiction" and foreclosing the use of the contextual factors identified in *Dunsmuir.* These developments introduce incremental changes to our judicial review framework, while respecting its underlying principles and placing the ball in the legislatures' court to modify the standards of review if they wish.

[283] To the extent that concerns were expressed about the quality of administrative decision making by some interveners who represented particularly vulnerable groups, we agree that they must be taken seriously. But the solution does not lie in authorizing more incursions into the administrative system by

[281] Il ressort des propos de lord Bingham qu'on doit trouver un équilibre subtil entre le maintien de la stabilité de la common law et l'assurance que le droit est suffisamment souple et réceptif pour s'adapter à de nouvelles réalités et à l'évolution des normes sociales. La règle du *stare decisis* joue un rôle essentiel pour maintenir cet équilibre et assurer le respect de la primauté du droit. Lorsque la règle du *stare decisis* est respectée, la jurisprudence agit comme une force stabilisatrice : elle offre une certitude quant à l'état du droit, assure une uniformité qui permet aux justiciables d'organiser leurs affaires en conséquence, et garantit une pérennité qui permet aux justiciables de se fier aux conséquences juridiques qu'elle prévoit. La règle du *stare decisis* est au cœur du développement itératif de la common law, ce qui favorise son évolution progressive, graduelle et responsable.

[282] Alors, que suggérons-nous? Nous sommes en faveur d'un cadre d'analyse de la norme de contrôle qui repose sur une règle de déférence significative et fondée *à la fois* sur le choix du législateur de déléguer des pouvoirs décisionnels à des acteurs administratifs *et* sur l'expertise spécialisée que ces décideurs possèdent et acquièrent au fur et à mesure qu'ils s'acquittent de leur mandat. Exception faite des trois catégories qui demeurent assujetties à la norme de la décision correcte établies dans l'arrêt *Dunsmuir* — et à défaut de directives claires et explicites du législateur sur la *norme* de contrôle applicable —, c'est la norme de la décision raisonnable qui s'applique au contrôle judiciaire des décisions administratives. À l'instar de la majorité, nous sommes en faveur de l'élimination de la catégorie des « questions touchant véritablement à la compétence » et de l'abandon des facteurs contextuels évoqués dans l'arrêt *Dunsmuir*. Ces propositions incorporent des changements progressifs dans notre cadre d'analyse de contrôle judiciaire tout en respectant ses principes sous-jacents et en laissant au législateur le soin de modifier les normes de contrôle, s'il le souhaite.

[283] Nous sommes d'accord pour dire qu'il faut prendre au sérieux les réserves exprimées par certains intervenants représentant des groupes particulièrement vulnérables au sujet de la qualité des décisions administratives. Mais la solution ne passe pas selon nous par la possibilité pour des juges généralistes

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generalist judges who lack the expertise necessary to implement these sensitive mandates. Any perceived shortcomings in administrative decision making are not solved by permitting *de novo* review of every legal decision by a court and, as a result, adding to the delay and cost of obtaining a final decision. The solution lies instead in ensuring the proper qualifications and training of administrative decision-makers. Like courts, administrative actors are fully capable of, and responsible for, improving the quality of their own decision-making processes, thereby strengthening access to justice in the administrative justice system.

[284] We also acknowledge that this Court should offer additional direction on conducting reasonableness review.[7] We fear, however, that the majority's multi-factored, open-ended list of "constraints" on administrative decision making will encourage reviewing courts to dissect administrative reasons in a "line-by-line treasure hunt for error" (*Communications, Energy and Paperworkers Union of Canada, Local 30 v. Irving Pulp & Paper, Ltd.*, [2013] 2 S.C.R. 458, at para. 54). These "constraints" may function in practice as a wide-ranging catalogue of hypothetical errors to justify quashing an administrative decision — a checklist with unsettling similarities to the series of "jurisdictional errors" spelled out in *Anisminic* itself.

[285] Structuring reasonableness review in this fashion effectively imposes on administrative decision-makers a higher standard of justification than that applied to trial judges. Such an approach undercuts deference and revives a long-abandoned posture of suspicion towards administrative decision making. We are also concerned by the majority's warning that

[7] Consistent with requests from some commentators and some of the interveners at these hearings, including the Canadian Bar Association and the Council of Canadian Administrative Tribunals (see also Mullan, at pp. 76-78).

qui n'ont pas l'expertise nécessaire pour exécuter ces mandats délicats de s'immiscer encore plus dans la justice administrative. On ne corrige pas ce que l'on estime être une lacune dans la prise de décisions administratives en permettant aux cours de procéder à un examen *de novo* de chaque décision juridique et, ce faisant, en allongeant les délais et en augmentant les frais engagés pour obtenir une décision définitive. La solution réside plutôt dans le fait de s'assurer que les décideurs administratifs possèdent les qualifications et la formation requises. À l'instar des cours, les acteurs administratifs sont tout à fait en mesure d'améliorer la qualité de leur processus décisionnel et il leur incombe de le faire, améliorant du coup l'accès à la justice administrative.

[284] Nous reconnaissons également que notre Cour devrait fournir des balises supplémentaires quant à la façon de procéder à un contrôle judiciaire fondé sur la norme de la décision raisonnable[7]. Nous craignons toutefois que la liste multifactorielle et non limitative des « contraintes » à la prise de décisions administratives dressée par la majorité n'incite les cours de révision à disséquer les motifs administratifs et à se lancer dans « une chasse au trésor, phrase par phrase, à la recherche d'une erreur » (*Syndicat canadien des communications, de l'énergie et du papier, Local 30 c. Irving Pulp & Paper, Ltd*, [2013] 2 R.C.S. 458, par. 54). En pratique, ces « contraintes » risquent de se transformer en un vaste catalogue d'erreurs hypothétiques qui peuvent servir à justifier l'annulation d'une décision administrative et devenir une liste de contrôle offrant des similitudes troublantes avec la série d'« erreurs de compétence » énoncées dans l'arrêt *Anisminic* lui-même.

[285] Cette façon de structurer le contrôle selon la norme de la décision raisonnable astreint effectivement les décideurs administratifs à une norme de justification plus exigeante que celle qui s'applique aux juges de première instance. Cette approche sape la déférence et ravive, à l'égard des décisions administratives, une attitude de méfiance qui avait été

[7] Pour répondre aux vœux formulés par certains commentateurs et certains des intervenants en l'espèce, dont l'Association du Barreau canadien et le Conseil des tribunaux administratifs canadiens (voir aussi Mullan, p. 76-78).

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administrative decision-makers cannot "arrogate powers to themselves that they were never intended to have", an unhelpful truism that risks reintroducing the tortured concept of "jurisdictional error" by another name.

[286] We would advocate a continued approach to reasonableness review which focuses on the concept of *deference* and what it requires of reviewing courts. Curial deference, after all, is *the* hallmark of reasonableness review, setting it apart from the substitution of opinion permitted under the correctness standard. The choice of a particular standard of review — whether described as "correctness", "reasonableness" or in other terms — is fundamentally about "whether or not a reviewing court should defer"[8] to an administrative decision (see *Dunsmuir*, at para. 141, per Binnie J., concurring; Régimbald, at pp. 539-40). If courts, therefore, are to properly conduct "reasonableness" review, they must properly understand what deference means.

[287] In our view, deference imposes three requirements on courts conducting reasonableness review. It informs the attitude a reviewing court must adopt towards an administrative decision-maker; it affects how a court frames the question it must answer on judicial review; and it affects how a reviewing court evaluates challenges to an administrative decision.

[288] First and foremost, deference is an "attitude of the court" conducting reasonableness review (*Dunsmuir*, at para. 48). Deference mandates respect for the legislative choice to entrust a decision to administrative actors rather than to the courts, and

[8] Factum of the intervener the Canadian Association of Refugee Lawyers, at para. 5; factum of the intervener the Council of Canadian Administrative Tribunals, at paras. 24-26.

mise au rancart depuis longtemps. Nous sommes par ailleurs préoccupés par la mise en garde de la majorité selon laquelle les décideurs administratifs ne peuvent « s'arroger des pouvoirs que le législateur n'a jamais voulu [leur] conférer », une évidence inutile qui risque de réintroduire sous un autre vocable le concept tortueux d'« erreur de compétence ».

[286] Nous préconisons le maintien d'une conception du contrôle judiciaire selon la norme de la raisonnabilité qui est centrée sur le principe de la *déférence* et sur ce qui est exigé des cours de révision. Après tout, la retenue judiciaire est *la* marque distinctive du contrôle selon la norme de la décision raisonnable et ce qui le distingue de la norme de la décision correcte, laquelle permet à la cour de substituer son opinion à celle du décideur administratif. Le choix d'une norme de contrôle particulière — qu'on la qualifie de norme de la décision « correcte » ou « raisonnable » ou autrement — consiste essentiellement à déterminer si la cour de révision « devrait ou non faire montre de déférence »[8] à l'égard d'une décision administrative (voir *Dunsmuir*, par. 141, motifs concordants du juge Binnie; Régimbald, p. 539-540). Par conséquent, pour que les cours puissent mener à bien un contrôle « fondé sur la norme de la décision raisonnable », elles doivent bien comprendre le sens du mot « déférence ».

[287] À notre avis, le principe de la déférence soumet à trois exigences les cours de révision qui procèdent à un contrôle selon la norme de la décision raisonnable. Il influence l'attitude que la cour de révision doit adopter à l'égard du décideur administratif; il influence la façon dont la cour formule la question à laquelle elle doit répondre lorsqu'elle est saisie d'une demande de contrôle judiciaire et il influe sur la façon dont elle évalue la contestation dont fait l'objet la décision administrative.

[288] D'abord et avant tout, la déférence est « une attitude de la cour » qui effectue un contrôle selon la norme de la décision raisonnable (*Dunsmuir*, par. 48). Le principe de la déférence commande le respect du choix du législateur de confier à des

[8] Mémoire de l'intervenante l'Association canadienne des avocats et avocates en droit des réfugiés, par. 5; mémoire de l'intervenant le Conseil des tribunaux administratifs canadiens, par. 24-26.

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for the important role that administrative decision-makers play in upholding and applying the rule of law (*Toronto (City) v. C.U.P.E., Local 79*, [2003] 3 S.C.R. 77, at para. 131, per LeBel J., concurring). Deference also requires respect for administrative decision-makers, their specialized expertise and the institutional setting in which they operate (*Dunsmuir*, at paras. 48-49). Reviewing courts must pay "respectful attention" to the reasons offered for an administrative decision, make a genuine effort to understand why the decision was made, and give the decision a fair and generous construction in light of the entire record (*Newfoundland Nurses*, at paras. 11-14 and 17).

[289] Second, deference affects how a court frames the question it must answer when conducting judicial review. A reviewing court does not ask how it would have resolved an issue, but rather, whether the answer provided by the administrative decision-maker has been shown to be unreasonable (*Khosa*, at paras. 59 and 61-62; *Dunsmuir*, at para. 47). Framing the inquiry in this way ensures that the administrative decision under review is the focus of the analysis.

[290] This Court has often endorsed this approach to conducting reasonableness review. In *Ryan*, for example, Iacobucci J. explained:

> . . . when deciding whether an administrative action was unreasonable, a court should not at any point ask itself what the correct decision would have been. . . . The standard of reasonableness does not imply that a decision-maker is merely afforded a "margin of error" around what the court believes is the correct result.
>
> . . . Unlike a review for correctness, there will often be no single right answer to the questions that are under review against the standard of reasonableness. . . . Even if there could be, notionally, a single best answer, it is not the court's role to seek this out when deciding if the decision was unreasonable. [paras. 50-51]

acteurs administratifs plutôt qu'aux cours de justice le soin de rendre certaines décisions et la reconnaissance du rôle important que jouent les décideurs administratifs pour faire respecter et appliquer le principe de la primauté du droit (*Toronto (Ville) c. S.C.F.P., section locale 79*, [2003] 3 R.C.S. 77, par. 131, motifs concordants du juge LeBel). Le principe de la déférence commande aussi le respect des décideurs administratifs, de leur expertise spécialisée et du cadre institutionnel dans lequel ils évoluent (*Dunsmuir*, par. 48-49). Les cours de révision doivent accorder une « attention respectueuse » aux motifs donnés à l'appui d'une décision administrative, s'efforcer sincèrement de comprendre la décision et interpréter la décision de façon équitable et généreuse, en tenant compte de l'ensemble du dossier (*Newfoundland Nurses*, par. 11-14 et 17).

[289] En deuxième lieu, le principe de la déférence influe sur la façon dont une cour formule la question à laquelle elle doit répondre lorsqu'elle effectue un contrôle judiciaire. La cour de révision ne cherche pas à savoir comment elle aurait résolu la question, mais plutôt s'il a été démontré que la réponse donnée par le décideur administratif était déraisonnable (*Khosa*, par. 59, 61-62; *Dunsmuir*, par. 47). En circonscrivant ainsi l'examen, on s'assure que l'analyse est bel et bien centrée sur la décision administrative à l'examen.

[290] Notre Cour a souvent cautionné cette vision du contrôle judiciaire selon la norme de la décision raisonnable. Dans l'arrêt *Ryan*, par exemple, le juge Iacobucci explique :

> . . . lorsqu'elle décide si une mesure administrative est déraisonnable, la cour ne doit à aucun moment se demander ce qu'aurait été la décision correcte. [. . .] La norme de la décision raisonnable n'implique pas que l'instance décisionnelle dispose simplement d'une « marge d'erreur » par rapport à ce que la cour estime être la solution correcte.
>
> . . . À la différence d'un examen selon la norme de la décision correcte, il y a souvent plus d'une seule bonne réponse aux questions examinées selon la norme de la décision raisonnable. [. . .] Même dans l'hypothèse où il y aurait une réponse meilleure que les autres, le rôle de la cour n'est pas de tenter de la découvrir lorsqu'elle doit décider si la décision est déraisonnable. [par. 50-51]

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(See also *Volvo Canada Ltd. v. U.A.W., Local 720*, [1980] 1 S.C.R. 178, at p. 214; *Toronto (City)*, at paras. 94-95, per LeBel J., concurring; *VIA Rail*, at para. 101; *Mason v. Minister of Citizenship and Immigration*, 2019 FC 1251, at para. 22 (CanLII), per Grammond J.; Régimbald, at p. 539; Sharpe, at pp. 204 and 208; Paul Daly, "The Signal and the Noise in Administrative Law" (2017), 68 *U.N.B.L.J.* 67, at p. 85; Evans, "Triumph of Reasonableness: But How Much Does It Really Matter?", at p. 107.)

[291] Third, deferential review impacts how a reviewing court evaluates challenges to an administrative decision. Deference requires the applicant seeking judicial review to bear the onus of showing that the decision was unreasonable (*Williams Lake Indian Band v. Canada (Aboriginal Affairs and Northern Development)*, [2018] 1 S.C.R. 83, at para. 108; *Mission Institution v. Khela*, [2014] 1 S.C.R. 502, at para. 64; *May v. Ferndale Institution*, [2005] 3 S.C.R. 809, at para. 71; *Ryan*, at para. 48; *Southam*, at para. 61; *Northern Telecom Ltd. v. Communications Workers of Canada*, [1980] 1 S.C.R. 115, at p. 130). Focusing on whether the applicant has demonstrated that the decision is unreasonable reinforces the central role that administrative decisions play in a properly deferential review process, and confirms that the decision-maker does not have to persuade the court that its decision is reasonable.

[292] Assessing whether a decision is reasonable also requires a qualitative assessment. Reasonableness is a concept that pervades the law but is difficult to define with precision (*Dunsmuir*, at para. 46). It requires, by its very nature, a fact-specific inquiry that involves a certain understanding of common experience. Reasonableness cannot be reduced to a formula or a checklist of factors, many of which will not be relevant to a particular decision. Ultimately, whether an administrative decision is reasonable will depend on the context (*Catalyst Paper Corp. v. North Cowichan (District)*, [2012] 1 S.C.R. 5, at para. 18). Administrative law covers an infinite variety of decisions and decision-making contexts, as LeBel J.

(Voir également *Volvo Canada Ltd. c. T.U.A., local 720*, [1980] 1 R.C.S. 178, p. 214; *Toronto (Ville) c. S.C.F.P.*, par. 94-95, motifs concordants du juge LeBel; *VIA Rail*, par. 101; *Mason c. Canada (Citoyenneté et Immigration)*, 2019 FC 1251, par. 22 (CanLII), le juge Grammond; Régimbald, p. 539; Sharpe, p. 204 et 208; Paul Daly, « The Signal and the Noise in Administrative Law » (2017), 68 *R.D. U.N.-B.* 67, p. 85; Evans, « Triumph of Reasonableness : But How Much Does It Really Matter? », p. 107.)

[291] Troisièmement, le contrôle fondé sur le principe de la déférence influence la façon dont la cour de révision évalue la contestation dont fait l'objet la décision administrative. La déférence fait reposer sur les épaules du demandeur le fardeau de démontrer que la décision faisant l'objet du contrôle judiciaire est déraisonnable (*Williams Lake Indian Band c. Canada (Affaires autochtones et Développement du Nord)*, [2018] 1 R.C.S. 83, par. 108; *Établissement de Mission c. Khela*, [2014] 1 R.C.S. 502, par. 64; *May c. Établissement Ferndale*, [2005] 3 R.C.S. 809, par. 71; *Ryan*, par. 48; *Southam*, par. 61; *Northern Telecom c. Travailleurs en communication*, [1980] 1 R.C.S. 115, p. 130). Limiter ainsi l'analyse à la question de savoir si le demandeur a démontré que la décision est déraisonnable renforce le rôle essentiel que jouent les décisions administratives dans le cadre d'un contrôle dûment axé sur le principe de la déférence et confirme que le décideur n'a pas à convaincre la cour de justice que sa décision est raisonnable.

[292] L'évaluation du caractère raisonnable d'une décision nécessite également une évaluation qualitative. La raisonnabilité est un concept omniprésent dans notre droit, mais difficile à définir avec précision (*Dunsmuir*, par. 46). Ce concept exige, de par sa nature même, une analyse factuelle qui implique une certaine compréhension des réalités courantes. Le caractère raisonnable ne peut être réduit à une formule ou à une liste de facteurs, dont bon nombre ne s'appliqueront pas à une décision particulière. En fin de compte, la question de savoir si une décision administrative est raisonnable dépend du contexte (*Catalyst Paper Corp. c. North Cowichan (District)*, [2012] 1 R.C.S. 5, par. 18). Le

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colourfully explained in *Blencoe v. British Columbia (Human Rights Commission)*, [2000] 2 S.C.R. 307, at para. 158 (dissenting in part, but not on this point):

> . . . not all administrative bodies are the same. Indeed, this is an understatement. At first glance, labour boards, police commissions, and milk control boards may seem to have about as much in common as assembly lines, cops, and cows! Administrative bodies do, of course, have some common features, but the diversity of their powers, mandate and structure is such that to apply particular standards from one context to another might well be entirely inappropriate.

[293] Deference, in our view, requires approaching each administrative decision on its own terms and in its own context. But we emphasize that the inherently contextual nature of reasonableness review does not mean that the degree of scrutiny applied by a reviewing court varies (*Alberta Teachers' Association*, at para. 47; *Wilson*, at para. 18). It merely means that when assessing a challenge to an administrative decision, a reviewing court must be attentive to all relevant circumstances, including the reasons offered to support the decision, the record, the statutory scheme and the particular issues raised by the applicant, among other factors (see, for example, *Suresh v. Canada (Minister of Citizenship and Immigration)*, [2002] 1 S.C.R. 3, at para. 40; *Newfoundland Nurses*, at para. 18; Van Harten et al., at p. 794). Without this context, it is impossible to determine what constitutes a sufficiently compelling justification to quash a decision under reasonableness review. Context may make a challenge to an administrative decision more or less persuasive — but it does not alter the deferential posture of the reviewing court (*Suresh*, at para. 40).

droit administratif englobe une diversité infinie de décisions et de contextes décisionnels, comme l'a expliqué de façon imagée le juge LeBel dans l'arrêt *Blencoe c. Colombie-Britannique (Human Rights Commission)*, [2000] 2 R.C.S. 307, para. 158 (dissident en partie, mais pas sur ce point) :

> . . . les organismes administratifs diffèrent les uns des autres. En fait, c'est le moins qu'on puisse dire. À première vue, un conseil des relations de travail, une commission de police et un office de contrôle laitier peuvent paraître avoir autant de points en commun qu'une ligne d'assemblage, un policier et une vache! Les organismes administratifs ont évidemment certaines caractéristiques en commun, mais en raison de la diversité de leurs attributions, de leur mandat et de leur organisation, il peut être totalement inapproprié d'appliquer les mêmes normes d'un contexte à l'autre.

[293] Selon nous, le principe de la déférence commande que l'on considère chaque décision administrative comme un cas d'espèce et qu'on tienne compte du contexte qui lui est propre. Nous tenons toutefois à préciser qu'il n'y a aucune corrélation entre le caractère foncièrement contextuel du contrôle judiciaire effectué selon la norme de la décision raisonnable et le degré d'attention avec lequel la cour de révision effectue son examen (*Alberta Teachers' Association*, par. 47; *Wilson*, par. 18). La nature contextuelle du contrôle judiciaire signifie simplement que, lorsqu'elle est saisie d'une contestation portant sur une décision administrative, la cour de révision doit tenir compte de toutes les circonstances pertinentes, y compris les motifs invoqués au soutien de la décision, le dossier, le régime législatif et les questions particulières soulevées par le demandeur, parmi d'autres facteurs (voir, par exemple, *Suresh c. Canada (Ministre de la Citoyenneté et de l'Immigration)*, [2002] 1 R.C.S. 3, par. 40; *Newfoundland Nurses*, par. 18; Van Harten et autres, p. 794). Sans ce contexte, il est impossible de déterminer ce qui constitue une justification suffisamment convaincante pour annuler une décision à l'issue d'un contrôle judiciaire selon la norme de la décision raisonnable. Le contexte peut influer sur le degré de persuasion de la contestation dont fait l'objet la décision administrative, mais il n'a aucune incidence sur l'attitude de déférence que doit conserver la cour de révision (*Suresh*, par. 40).

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[294] Deference, however, does not require reviewing courts to shirk their obligation to review the decision. So long as they maintain a respectful attitude, frame the judicial review inquiry properly and demand compelling justification for quashing a decision, reviewing courts are entitled to meaningfully probe an administrative decision. A thorough evaluation by a reviewing court is not "disguised correctness review", as some have used the phrase. Deference, after all, stems from respect, not inattention to detail.

[295] Bearing this in mind, we offer the following suggestions for conducting reasonableness review. We begin with situations where reasons are required.[9]

[296] The administrative decision is the focal point of the review exercise. Where reasons are provided, they serve as the natural starting point to determine whether the decision-maker acted reasonably (*Williams Lake*, at para. 36). By beginning with the reasons offered for the decision, read in light of the surrounding context and the grounds raised to challenge the decision, reviewing courts provide meaningful oversight while respecting the legitimacy of specialized administrative decision making.

[297] Reviewing courts should approach the reasons with respect for the specialized decision-makers, the significant role they have been assigned and the institutional context chosen by the legislator. Reasons should be approached generously, on their own terms. Reviewing courts should be hesitant to second-guess operational implications, practical challenges and on-the-ground knowledge used to justify an administrative decision. Reviewing courts must also remain alert to specialized concepts or language used in an administrative decision that may be unfamiliar to a generalist judge (*Newfoundland Nurses*, at para. 13;

[9] Under the duty of procedural fairness outlined in *Baker v. Canada (Minister of Citizenship and Immigration)*, [1999] 2 S.C.R. 817, at para. 43.

[294] La déférence ne suppose pas pour autant que la cour de révision se dérobe à son devoir de contrôler la décision. Dès lors qu'elle maintient une attitude de respect, qu'elle cerne correctement la question à trancher dans le cadre du contrôle judiciaire et qu'elle exige qu'on lui soumette des raisons impérieuses avant d'annuler une décision, il lui est loisible d'analyser en profondeur la décision administrative dont elle est saisie. Ce faisant, elle ne procède pas à un contrôle « déguisé selon la norme de la décision correcte », pour reprendre l'expression employée par certains. Après tout, la déférence est la marque d'une attitude de respect et non le signe d'un manque d'attention aux détails.

[295] Dans cette optique, nous aimerions proposer quelques pistes qui, selon nous, pourraient baliser le contrôle judiciaire selon la norme de la décision raisonnable. Nous commencerons par les situations où la décision en question doit être motivée[9].

[296] La décision administrative est le point de mire du contrôle judiciaire. Pour déterminer si le décideur a agi raisonnablement, la cour de révision doit d'abord, cela va de soi, examiner les motifs, s'il en est, qui ont été exposés (*Williams Lake*, par. 36). En se penchant d'abord sur les motifs de la décision, à la lumière du contexte qui l'entoure et des arguments invoqués pour la contester, la cour de révision procède à un véritable contrôle tout en respectant la légitimité du processus décisionnel des autorités administratives spécialisées.

[297] Les cours de révision devraient aborder les motifs dans un esprit de respect envers les décideurs spécialisés, le rôle important qui leur a été confié et le contexte institutionnel choisi par le législateur. Elles devraient interpréter les motifs de façon généreuse, en respectant leur teneur, et se garder de reconsidérer les incidences concrètes, les difficultés d'ordre pratique et les connaissances de terrain invoquées pour justifier la décision administrative. Elles doivent également demeurer attentives aux concepts ou termes spécialisés employés dans une décision administrative que les juges généralistes

[9] Pour respecter l'obligation d'équité procédurale selon l'arrêt *Baker c. Canada (Ministre de la Citoyenneté et de l'Immigration)*, [1999] 2 R.C.S. 817, par. 43.

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Igloo Vikski, at paras. 17 and 30). When confronted with unfamiliar language or modes of reasoning, judges should acknowledge that such differences are an inevitable, intentional and invaluable by-product of the legislative choice to assign a matter to the administrative system. They may lend considerable force to an administrative decision and, by the same token, render an applicant's challenge to that decision less compelling. Reviewing courts scrutinizing an administrative body's decision under the reasonableness framework should therefore keep in mind that the administrative body holds the "interpretative upper hand" (*McLean*, at para. 40).

[298] Throughout the review process, a court conducting deferential review must view claims of administrative error in context and with caution, cognizant of the need to avoid substituting its opinion for that of those empowered and better equipped to answer the questions at issue. Because judicial substitution is incompatible with deference, reviewing courts must carefully evaluate the challenges raised by an applicant to ensure they go to the *reasonableness* of the administrative decision.

[299] Unsurprisingly, applicants rarely present challenges to an administrative decision as explicit invitations for courts to substitute their opinions for those of administrative actors. Courts, therefore, must carefully probe challenges to administrative decisions to assess whether they amount, in substance, to a mere difference of opinion with how the administrative decision-maker weighed or prioritized the various factors relevant to the decision-making process. Allegations of error may, on deeper examination, simply reflect a legitimate difference in approach by an administrative decision-maker. By rooting out and rejecting such challenges, courts respect the valuable and distinct perspective that administrative bodies bring to answering legal questions, flowing from the considerable expertise and field sensitivity they develop by administering their mandate and working within the intricacies of their

connaissent peut-être moins bien (*Newfoundland Nurses*, par. 13; *Igloo Vikski*, par. 17 et 30). Lorsque les mots employés ou le raisonnement ne leur sont pas familiers, les juges devraient reconnaître que ces différences constituent une conséquence inévitable et inestimable du choix délibéré du législateur de confier la question au système de justice administrative. Ces particularités peuvent conférer une très grande force à une décision administrative et, du coup, affaiblir la contestation dont celle-ci fait l'objet. La cour de révision qui analyse la décision d'un organisme administratif selon la norme de la décision raisonnable devrait donc se rappeler que l'organisme jouit d'un « privilège [. . .] en matière d'interprétation » (*McLean*, par. 40).

[298] Tout au long du contrôle fondé sur le principe de la déférence, la cour doit examiner les allégations d'erreur administrative avec prudence, en tenant compte du contexte et de la nécessité d'éviter de substituer son opinion à celle des personnes qui sont habilitées à répondre aux questions en litige et mieux outillées qu'elle pour le faire. Étant donné que le principe de la déférence lui interdit de substituer son opinion à celle du décideur, la cour de révision doit évaluer avec circonspection les arguments que le demandeur invoque pour contester une décision administrative afin de s'assurer qu'ils concernent le caractère *raisonnable* de celle-ci.

[299] Sans surprise, on constate qu'il est rare que les demandeurs formulent leur contestation d'une décision administrative comme une invitation explicite adressée aux cours de révision de substituer leur opinion à celle des acteurs administratifs. En conséquence, les cours doivent examiner attentivement la contestation d'une décision administrative afin de déterminer si cette contestation tient essentiellement à une simple divergence d'opinions quant à la façon dont le décideur a soupesé ou apprécié les différents facteurs qui entrent en ligne de compte dans le cadre du processus décisionnel. Un examen plus approfondi peut révéler que les allégations d'erreur reflètent simplement l'approche différente légitimement retenue par le décideur administratif. En écartant et en rejetant ces contestations, les cours respectent l'angle distinct et précieux sous lequel les organismes administratifs apportent des réponses à

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statutory context on a daily basis. The understanding and insights of administrative actors enhance the decision-making process and may be more conducive to reaching a result "that promotes effective public policy and administration . . . than the limited knowledge, detachment, and modes of reasoning typically associated with courts of law" (*National Corn Growers*, at pp. 1336-37 (emphasis deleted), per Wilson J., concurring, citing J. M. Evans et al., *Administrative Law: Cases, Text, and Materials* (3rd ed. 1989), at p. 414).

[300] When resolving challenges to an administrative decision, courts must also consider the *materiality* of any alleged errors in the decision-maker's reasoning. Under reasonableness review, an error is not necessarily sufficient to justify quashing a decision. Inevitably, the weight of an error will depend on the extent to which it affects the decision. An error that is peripheral to the administrative decision-maker's reasoning process, or overcome by more compelling points advanced in support of the result, does not provide fertile ground for judicial review. Ultimately, the role of the reviewing court is to examine the decision as a whole to determine whether it is reasonable (*Dunsmuir*, at para. 47; *Khosa*, at para. 59). Considering the materiality of any impugned errors is a natural part of this exercise, and of reading administrative reasons "together with the outcome" (*Newfoundland Nurses*, at para. 14).

[301] Review of the decision as a whole is especially vital when an applicant alleges that an administrative decision contains material omissions. Significantly, and as this Court has frequently emphasized, administrative decision-makers are not required to consider and comment upon every issue raised by the parties in their reasons (*Construction Labour Relations v. Driver Iron Inc.*, [2012] 3 S.C.R. 405, at para. 3; *Newfoundland Nurses*, at para. 16, citing *Service Employees' International Union, Local*

des questions de droit, forts de la grande connaissance et de la sensibilité qu'ils acquièrent en accomplissant leur mandat et en appliquant au quotidien des régimes législatifs complexes. La compréhension éclairée des acteurs administratifs rehausse la qualité du processus décisionnel et permet davantage d'atteindre un résultat [TRADUCTION] « qui favorise l'efficacité des politiques et de l'administration publique [. . .] [que les] connaissances limitées, [le] détachement et [les] modes de raisonnement qui caractérisent normalement les cours de justice » (*National Corn Growers*, p. 1336-1337 (soulignement omis), motifs concordants de la juge Wilson, citant J. M. Evans et autres, *Administrative Law : Cases, Text and Materials* (3e éd. 1989), p. 414).

[300] Lorsqu'ils sont saisis d'une contestation d'une décision administrative, les cours de révision doivent également tenir compte de la *gravité* des erreurs dont serait entaché le raisonnement du décideur. Dans le cadre du contrôle judiciaire fondé sur la norme de la décision raisonnable, une erreur ne suffit pas nécessairement en soi à justifier l'annulation d'une décision. La gravité de l'erreur dépend invariablement de la mesure dans laquelle elle influe sur la décision. L'erreur ne peut servir de fondement à une demande de contrôle judiciaire lorsqu'elle est secondaire au regard du raisonnement du décideur administratif ou mineure par rapport aux arguments plus solides invoqués pour justifier le résultat souhaité. En fin de compte, le rôle de la cour de révision consiste à examiner la décision dans son ensemble pour savoir si elle est raisonnable (*Dunsmuir*, par. 47; *Khosa*, par. 59). La prise en compte de la gravité des erreurs reprochées fait naturellement partie de cette opération et de l'examen des motifs de la décision « en corrélation avec le résultat » (*Newfoundland Nurses*, par. 14).

[301] L'examen de la décision dans son ensemble est d'autant plus essentiel lorsque le demandeur soutient qu'une décision administrative est entachée de graves omissions. Fait important à souligner, ainsi que notre Cour l'a fait remarquer à maintes reprises, les décideurs administratifs ne sont pas tenus d'examiner et de commenter dans leurs motifs chaque argument soulevé par les parties (*Construction Labour Relations c. Driver Iron Inc.*, [2012] 3 R.C.S. 405, par. 3; *Newfoundland Nurses*, par. 16, citant *Union internationale*

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No. 333 v. Nipawin District Staff Nurses Association, [1975] 1 S.C.R. 382, at p. 391). Further, a reviewing court is not restricted to the four corners of the written reasons delivered by the decision-maker and should, if faced with a gap in the reasons, look to the record to see if it sheds light on the decision (*Williams Lake*, at para. 37; *Delta Air Lines Inc. v. Lukács*, [2018] 1 S.C.R. 6, at para. 23; *Newfoundland Nurses*, at para. 15; *Alberta Teachers' Association*, at paras. 53 and 56).

[302] The use of the record and other context to supplement a decision-maker's reasons has been the subject of some academic discussion (see, for example, Mullan, at pp. 69-74). We support a flexible approach to supplementing reasons, which is consistent with the flexible approach used to determine whether administrative reasons must be provided to begin with and sensitive to the "day-to-day realities of administrative agencies" (*Baker*, at para. 44), which may not be conducive to the production of "archival" reasons associated with court judgments (para. 40, citing Roderick A. Macdonald and David Lametti, "Reasons for Decision in Administrative Law" (1990), 3 *C.J.A.L.P.* 123).

[303] Some materials that may help bridge gaps in a reviewing court's understanding of an administrative decision include: the record of any formal proceedings as well as the materials before the decision-maker, past decisions of the administrative body, and policies or guidelines developed to guide the type of decision under review (see Matthew Lewans, "Renovating Judicial Review" (2017), 68 *U.N.B.L.J.* 109, at pp. 137-38). Reviewing these materials may assist a court in understanding, "by inference", why an administrative decision-maker reached a particular outcome (*Baker*, at para. 44; see also *Williams Lake*, at para. 37; *Mills v. Workplace Safety and Insurance Appeals Tribunal (Ont.)*, 2008 ONCA 436, 237 O.A.C. 71, at paras. 38-39). It may reveal further confirmatory context for a line of reasoning employed by the decision-maker — by showing, for example, that the decision-maker's understanding of the purpose of its statutory mandate finds support in the provision's legislative history

des employés des services, Local no. 333 c. Nipawin District Staff Nurses Association, [1975] 1 R.C.S. 382, p. 391). De plus, l'examen qu'effectue la cour de révision ne se limite pas à la teneur même des motifs écrits de la décision; lorsqu'elle constate l'existence d'une lacune dans les motifs, la cour doit examiner le dossier pour savoir s'il permet de mieux comprendre la décision (*Williams Lake*, par. 37; *Delta Air Lines Inc. c. Lukács*, [2018] 1 R.C.S. 6, par. 23; *Newfoundland Nurses*, par. 15; *Alberta Teachers' Association*, par. 53 et 56).

[302] Certains théoriciens se sont penchés sur l'utilisation du dossier et d'autres éléments contextuels pour compléter les motifs exposés par le décideur (voir, par exemple, Mullan, p. 69-74). Nous sommes quant à nous en faveur de la possibilité de compléter les motifs, car cette démarche va de pair avec l'approche souple qui sert à déterminer si la décision administrative doit ou non être motivée et tient compte « de la réalité quotidienne des organismes administratifs » (*Baker*, par. 44), laquelle se prête peut-être mal à la production de motifs « d'archives » s'apparentant aux décisions judiciaires (par. 40, citant Roderick A. Macdonald et David Lametti, « Reasons for Decision in Administrative Law » (1990), 3 *R.C.D.A.P.* 123).

[303] Afin de combler les lacunes que comporte la décision administrative dont elle est saisie, la cour de révision pourrait consulter, par exemple, le dossier des actes de procédure officiels, les documents portés à l'attention du décideur, les décisions antérieures de l'organisme administratif, ainsi que les politiques ou lignes directrices élaborées pour l'aider dans sa démarche (voir Matthew Lewans, « Renovating Judicial Review » (2017), 68 *R.D. U.N.-B.* 109, p. 137-138). Après avoir consulté ces documents, la cour sera peut-être davantage en mesure de comprendre, « par déduction », pourquoi un décideur administratif est parvenu à un certain résultat (*Baker*, par. 44; voir également *Williams Lake*, par. 37; *Mills c. Workplace Safety and Insurance Appeals Tribunal (Ont.)*, 2008 ONCA 436, 237 O.A.C. 71, par. 38-39). Il pourra aussi y trouver d'autres éléments contextuels qui viennent corroborer le raisonnement suivi par le décideur. Ces éléments pourraient démontrer, par exemple, que l'interprétation proposée par le décideur en ce qui concerne l'objet

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(*Celgene Corp. v. Canada (Attorney General)*, [2011] 1 S.C.R. 3, at paras. 25-29). Reviewing the record can also yield responses to the specific challenges raised by an applicant on judicial review, responses that are "consistent with the process of reasoning" applied by the administrative decision-maker (*Igloo Vikski*, at para. 45). In these ways, reviewing courts may legitimately supplement written reasons without "supplant[ing] the analysis of the administrative body" (*Lukács*, at para. 24).

[304] The "adequacy" of reasons, in other words, is not "a stand-alone basis for quashing a decision" (*Newfoundland Nurses*, at para. 14). As this Court has repeatedly confirmed, reasons must instead "be read together with the outcome and serve the purpose of showing whether the result falls within a range of possible outcomes" (*Newfoundland Nurses*, at para. 14; *Halifax (Regional Municipality) v. Canada (Public Works and Government Services)*, [2012] 2 S.C.R. 108, at para. 44; *Agraira v. Canada (Public Safety and Emergency Preparedness)*, [2013] 2 S.C.R. 559, at para. 52; *Williams Lake*, at para. 141, per Rowe J., dissenting, but not on this point). This approach puts substance over form in situations where the basis for a decision by a specialized administrative actor is evident on the record, but not clearly expressed in written reasons. Quashing decisions in such circumstances defeats the purpose of deference and thwarts access to justice by wasting administrative and judicial resources.

[305] In our view, therefore, if an applicant claims that an administrative decision-maker failed to address a relevant factor in reaching a decision, the reviewing court must consider the submissions and record before the decision-maker, and the materiality of any such omission to the decision rendered. An administrative decision-maker's failure, for example, to refer to a particular statutory provision or the full factual record before it does not automatically entitle a reviewing court to conduct a *de novo* assessment of the decision under review. The inquiry must remain focussed on whether the applicant has satisfied the

du mandat que lui a confié la loi trouve appui dans l'historique législatif de la disposition (*Celgene Corp. c. Canada (Procureur général)*, [2011] 1 R.C.S. 3, par. 25-29). En consultant le dossier, la cour pourra également trouver des réponses aux arguments spécifiques invoqués par le demandeur au soutien de sa demande de contrôle judiciaire, c'est-à-dire des réponses qui « [vont] dans le même sens [que] le raisonnement suivi par le décideur » (*Igloo Vikski*, par. 45). Voilà comment les cours de révision peuvent légitimement compléter les motifs écrits sans « supplanter l'analyse de l'organisme administratif » (*Lukács*, par. 24).

[304] En d'autres termes, l'« insuffisance » des motifs « [ne] permet [pas] à elle seule de casser une décision » (*Newfoundland Nurses*, par. 14). Ainsi que notre Cour l'a affirmé à maintes reprises, les motifs doivent plutôt « être examinés en corrélation avec le résultat et ils doivent permettre de savoir si celui-ci fait partie des issues possibles » (*Newfoundland Nurses*, par. 14; *Halifax (Regional Municipality) c. Canada (Travaux publics et Services gouvernementaux)*, [2012] 2 R.C.S. 108, par. 44; *Agraira c. Canada (Sécurité publique et Protection civile)*, [2013] 2 R.C.S. 559, par. 52; *Williams Lake*, par. 141, motifs dissidents du juge Rowe, mais non sur ce point). Cette approche privilégie le fond plutôt que la forme dans les situations où le fondement de la décision rendue par un acteur administratif spécialisé est évident au vu du dossier, mais n'est pas exposé clairement dans ses motifs écrits. L'annulation des décisions dans ces circonstances va à l'encontre de l'objet du principe de la déférence et fait entrave à l'accès à la justice en entraînant un gaspillage des ressources administratives et judiciaires.

[305] En conséquence, à notre avis, si le demandeur reproche au décideur administratif de ne pas avoir tenu compte d'un facteur pertinent pour en arriver à sa décision, la cour de révision doit examiner les arguments et le dossier dont le décideur était saisi, ainsi que l'importance relative de l'omission par rapport à la décision rendue. Si le décideur a omis, par exemple, de mentionner une disposition législative précise ou l'ensemble du dossier factuel complet porté à son attention, la cour de révision n'a pas automatiquement le droit de procéder à un examen *de novo* de la décision contestée. L'analyse

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burden of showing that the omission renders the decision reached unreasonable.

[306] We acknowledge that respecting the line between reasonableness and correctness review has posed a particular challenge for judges when reviewing interpretation by administrative decision-makers of their statutory mandates. Judges routinely interpret statutes and have developed a template for how to scrutinize words in that context. But the same deferential approach we have outlined above must apply with equal force to statutory interpretation cases. When reviewing an administrative decision involving statutory interpretation, a court should not assess the decision by determining what, in its own view, would be a reasonable interpretation. Such an approach "imperils deference" (Paul Daly, "Unreasonable Interpretations of Law" (2014), 66 *S.C.L.R.* (2d) 233, at p. 250).

[307] We agree with Justice Evans that "once [a] court embarks on its own interpretation of the statute to determine the reasonableness of the tribunal's decision, there seems often to be little room for deference" (Evans, "Triumph of Reasonableness: But How Much Does It Really Matter?", at p. 109; see also *Mason*, at para. 34; Dyzenhaus, "Dignity in Administrative Law: Judicial Deference in a Culture of Justification", at p. 108; Daly, "Unreasonable Interpretations of Law", at pp. 254-55). We add that a *de novo* interpretation of a statute, conducted as a prelude to "deferential" review, necessarily omits a vital piece of the interpretive puzzle: the perspective of the front-line, specialized administrative body that routinely applies the statutory scheme in question (Dyzenhaus, "The Politics of Deference: Judicial Review and Democracy", at p. 304; Paul Daly, "Deference on Questions of Law" (2011), 74 *Mod. L. Rev.* 694). By placing that perspective at the heart of the judicial review inquiry, courts display respect for administrative specialization and expertise, and for the legislative choice to delegate certain questions to non-judicial bodies.

doit se limiter à déterminer si le demandeur s'est déchargé du fardeau qui lui incombait d'établir que l'omission rend la décision contestée déraisonnable.

[306] Nous reconnaissons qu'il est particulièrement difficile pour les juges de respecter la ligne de démarcation entre la norme de la décision raisonnable et celle de la décision correcte lorsqu'ils sont appelés à réviser l'interprétation que des décideurs administratifs ont donnée à leur mandat statutaire. Les juges interprètent quotidiennement des lois et ils ont mis au point une grille dont ils se servent pour analyser les mots dans ce contexte. Ils doivent toutefois conserver la même attitude de déférence dont nous avons déjà parlé lorsqu'ils interprètent une disposition législative. Lorsqu'elle révise une décision administrative portant sur l'interprétation d'une disposition législative, la cour de révision ne devrait pas évaluer la décision en tentant de déterminer l'interprétation qui, à son avis, serait raisonnable. Pareille attitude [TRADUCTION] « met en péril la déférence » (Paul Daly, « Unreasonable Interpretations of Law » (2014), 66 *S.C.L.R.* (2d) 233, p. 250).

[307] Nous convenons avec le juge Evans que [TRADUCTION] « dès lors que la cour se lance dans sa propre interprétation de la loi pour déterminer si la décision du tribunal administratif était raisonnable, il semble y avoir peu de place pour la déférence » (Evans, « Triumph of Reasonableness : But How Much Does It Really Matter? », p. 109; voir également *Mason*, par. 34; Dyzenhaus, « Dignity in Administrative Law : Judicial Deference in a Culture of Justification », p. 108; Daly, « Unreasonable Interpretations of Law », p. 254-255). Ajoutons qu'une interprétation *de novo* d'une loi, effectuée avant un contrôle effectué selon le principe de la déférence, occulte nécessairement un élément essentiel du processus d'interprétation : le point de vue de l'organisme administratif spécialisé qui applique régulièrement le régime législatif en question (Dyzenhaus, « Politics of Deference : Judicial Review and Democracy », p. 304; Paul Daly, « Deference on Questions of Law » (2011), 74 *Mod. L. Rev.* 694). En plaçant ce point de vue au cœur de leur analyse, les cours de justice témoignent de leur respect à l'endroit des compétences et connaissances spécialisées des organismes administratifs ainsi qu'à l'égard du choix du législateur de déléguer le traitement de certaines questions à des organismes non judiciaires.

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[308] Conversely, by imposing their own interpretation of a statutory provision, courts *undermine* legislative intent to confide a mandate to the decision-maker. Applying a statute will almost always require some interpretation, making the interpretive mandate of administrative decision-makers inherent to their legislative mandate. The decision-maker who applies the statute has primary responsibility for interpreting the provisions in order to carry out their mandate effectively.

[309] Administrative decision-makers performing statutory interpretation should therefore be permitted to be guided by their expertise and knowledge of the practical realities of their administrative regime. In many cases, the "ordinary meaning" of a word or term makes no sense in a specialized context. And in some settings, law and policy are so inextricably at play that they give the words of a statute a meaning unique to a particular specialized context (*National Corn Growers*, at p. 1336, per Wilson J., concurring; *Domtar Inc.*, at p. 800). Further, not only are statutory provisions sometimes capable of bearing more than one reasonable interpretation, they are sometimes drafted in general terms or with "purposeful ambiguity" in order to permit adaptation to future, unknown circumstances (see Felix Frankfurter, "Some Reflections on the Reading of Statutes" (1947), 47 *Colum. L. Rev.* 527, at p. 528). These considerations make it all the more compelling that reviewing courts avoid imposing judicial norms on administrative decision-makers or maintaining a dogmatic insistence on formalism. Where a decision-maker can explain its decision adequately, that decision should be upheld (Daly, "Unreasonable Interpretations of Law", at pp. 233-34, 250 and 254-55).

[310] Justice Brown's reasons in *Igloo Vikski* provide a useful illustration of a properly deferential approach to statutory interpretation. That case involved an interpretation of the *Customs Tariff*, S.C. 1997, c. 36, as it applies to hockey goaltender gloves. The Canada Border Services Agency had classified the

[308] À l'inverse, en imposant leur propre interprétation d'une disposition législative, les cours de justice *dénaturent* l'intention du législateur de confier un mandat au décideur. Dans presque tous les cas, il est nécessaire d'interpréter les dispositions d'une loi pour les appliquer, de sorte que le mandat que le législateur confie aux décideurs administratifs comporte foncièrement une fonction d'interprétation. Le décideur qui applique la loi est la principale personne chargée d'en interpréter les dispositions afin de s'acquitter efficacement de son mandat.

[309] Lorsqu'ils interprètent des dispositions législatives, les décideurs administratifs devraient donc être autorisés à tabler sur leur compétence spécialisée et sur la connaissance qu'ils ont des réalités pratiques de leur régime administratif. Assez souvent, les mots et les termes ont une signification tout à fait différente de leur « sens ordinaire » lorsqu'ils sont employés dans un domaine spécialisé. Dans certains cas, les règles de droit et les politiques sont si étroitement liées entre elles qu'elles confèrent aux mots d'une loi un sens unique qui est propre à un contexte particulier (*National Corn Growers*, p. 1336, motifs concordants de la juge Wilson; *Domtar Inc.*, p. 800). Qui plus est, non seulement les dispositions législatives peuvent-elles parfois se prêter à plusieurs interprétations raisonnables, mais elles peuvent aussi avoir été rédigées de manière générale ou [TRADUCTION] « délibérément ambiguë » afin de pouvoir être adaptées à des circonstances ultérieures inconnues (voir Felix Frankfurter, « Some Reflections on the Reading of Statutes » (1947), 47 *Colum. L. Rev.* 527, p. 528). Pour toutes ces raisons, il est impératif que les cours de révision évitent d'imposer des normes judiciaires aux décideurs administratifs ou d'insister de façon dogmatique sur le formalisme. Lorsque le décideur peut expliquer sa décision de manière adéquate, cette décision devrait être confirmée (Daly, « Unreasonable Interpretations of Law », p. 233-234, 250 et 254-255).

[310] Les motifs de la décision qu'a rendue le juge Brown dans l'affaire *Igloo Vikski* constituent un bon exemple d'une attitude de déférence à privilégier en matière d'interprétation législative. Cette affaire portait sur l'interprétation du *Tarif des douanes*, L.C. 1997, c. 36, à l'égard de gants de gardien de

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gloves as "[g]loves, mittens [or] mitts". Igloo Vikski argued they should have been classified as sporting equipment. The Canadian International Trade Tribunal ("CITT") confirmed the initial classification. The Federal Court of Appeal reversed the decision.

[311] Acknowledging that the "specific expertise" of the CITT gave it the upper hand over a reviewing court with respect to certain questions of law, Justice Brown determined that the standard of review was reasonableness. Writing for seven other members of the Court, he carefully reviewed the reasons of the CITT and how it had engaged with Igloo Vikski's arguments before turning to the errors alleged by Igloo Vikski and the Federal Court of Appeal. Conceding that the CITT reasons lacked "perfect clarity", Justice Brown nevertheless concluded that the Tribunal's interpretation was reasonable. While he agreed with Igloo Vikski that an alternate interpretation to that given by the CITT was available, the inclusive language of the applicable statute was broad enough to accommodate the CITT's reasonable interpretation. By beginning with the reasons offered for the interpretation and turning to the challenges mounted against it in light of the surrounding context, *Igloo Vikski* provides an excellent example of respectful and properly deferential judicial review.

[312] We conclude our discussion of reasonableness review by addressing cases where reasons are neither required nor available for judicial review. In these circumstances, a reviewing court should remain focussed on whether the decision has been shown to be unreasonable. The reasonableness of the decision may be justified by past decisions of the administrative body (see *Edmonton East*, at paras. 38 and 44-46; *Alberta Teachers' Association*, at paras. 56-64). In other circumstances, reviewing courts may have to assess the reasonableness of the outcome in light of the procedural context surrounding the decision (see *Law Society of British Columbia v. Trinity Western University*, [2018] 2 S.C.R. 293,

but pour le hockey. L'Agence des services frontaliers du Canada avait classé les gants comme des « gants, mitaines et moufles ». Igloo Vikski soutenait qu'ils auraient dû être classés comme des articles de sport. Le Tribunal canadien du commerce extérieur (« TCCE ») a confirmé la classification initiale, mais la Cour d'appel fédérale a infirmé la décision.

[311] Reconnaissant que « l'expertise spécialisée » du TCCE donnait à celui-ci un avantage sur la cour de révision relativement à certaines questions de droit, le juge Brown a décidé que la norme de contrôle était celle de la décision raisonnable. S'exprimant au nom de sept autres membres de la Cour, il a soigneusement passé en revue les motifs de la décision du TCCE et la façon dont le Tribunal avait analysé les arguments d'Igloo Vikski, avant de se pencher sur les erreurs invoquées par celle-ci et par la Cour d'appel fédérale. Reconnaissant que les motifs de la décision du TCCE n'étaient pas « parfaitement limpides », le juge Brown a néanmoins conclu que l'interprétation du Tribunal était raisonnable. Tout en convenant avec Igloo Vikski qu'une autre interprétation que celle donnée par le TCCE était possible, il a précisé que, compte tenu de sa formulation générale, la loi applicable avait une portée suffisamment large pour englober l'interprétation raisonnable faite par le TCCE. L'arrêt *Igloo Vikski*, dans lequel le juge Brown résume d'abord les motifs exposés au soutien de l'interprétation, puis les arguments invoqués pour la contester, eu égard au contexte, représente un excellent exemple d'un contrôle judiciaire respectueux et empreint de la déférence souhaitable.

[312] Nous concluons notre examen du contrôle selon la norme de la raisonnabilité en passant aux situations dans lesquelles le décideur n'est pas tenu de motiver sa décision ou dans lesquelles il est impossible d'obtenir les motifs de la décision aux fins de contrôle judiciaire. En pareil cas, la cour de révision devrait s'en tenir à la question de savoir s'il a été établi que la décision est déraisonnable. Le caractère raisonnable de la décision peut être démontré à l'aide de décisions antérieures de l'organisme administratif (voir *Edmonton East*, par. 38, 44-46; *Alberta Teachers' Association*, par. 56-64). Dans d'autres cas, la cour de révision devra peut-être s'en remettre au contexte procédural entourant

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at paras. 51-56; *Edmonton East*, at paras. 48-60; *Catalyst Paper Corp.*, at paras. 32-36). In all cases, the question remains whether the challenging party has demonstrated that a decision is unreasonable.

[313] In sum, reasonableness review is based on deference to administrative decision-makers and to the legislative intention to confide in them a mandate. Deference must inform the attitude of a reviewing court and the nature of its analysis: the court does not ask how it would have resolved the issue before the administrative decision-maker but instead evaluates whether the decision-maker acted reasonably. The reviewing court starts with the reasons offered for the administrative decision, read in light of the surrounding context and based on the grounds advanced to challenge the reasonableness of the decision. The reviewing court must remain focussed on the reasonableness of the decision viewed as a whole, in light of the record, and with attention to the materiality of any alleged errors to the decision-maker's reasoning process. By properly conducting reasonableness review, judges provide careful and meaningful oversight of the administrative justice system while respecting its legitimacy and the perspectives of its front-line, specialized decision-makers.

Application to Mr. Vavilov

[314] Alexander Vavilov challenges the Registrar of Citizenship's decision to cancel his citizenship certificate. The Registrar concluded that Mr. Vavilov was not a Canadian citizen, and therefore not entitled to a certificate of Canadian citizenship because, although he was born in Canada, his parents were "other representative[s] or employee[s] in Canada of a foreign government" within the meaning of s. 3(2)(a) of the *Citizenship Act*, R.S.C. 1985, c. C-29.

la décision pour apprécier le caractère raisonnable du résultat (voir *Law Society of British Columbia c. Trinity Western University*, [2018] 2 R.C.S. 293, par. 51-56; *Edmonton East*, par. 48-60; *Catalyst Paper Corp.*, par. 32-36). Dans tous les cas, la question à trancher demeure celle de savoir si la partie qui conteste la décision a démontré que celle-ci est déraisonnable.

[313] En résumé, le contrôle judiciaire selon la norme de la décision raisonnable commande la déférence à l'égard des décideurs administratifs et le respect de l'intention du législateur de leur confier un mandat. La déférence doit éclairer l'attitude de la cour de révision et la nature de l'analyse qu'elle mènera : il ne s'agit pas pour elle de déterminer comment elle aurait tranché la question dont le décideur administratif était saisi, mais plutôt de se demander si celui-ci a agi de façon raisonnable. À cette fin, elle examine d'abord les motifs exposés au soutien de la décision administrative à la lumière du contexte et des arguments invoqués par la partie qui affirme qu'elle n'est pas raisonnable. La cour de révision doit faire porter son analyse principalement sur le caractère raisonnable de la décision examinée dans son ensemble, à la lumière du dossier, en tenant compte de la gravité des erreurs dont serait entaché le raisonnement du décideur. En appliquant comme il se doit la norme de la décision raisonnable lors du contrôle judiciaire des décisions contestées devant eux, les juges assurent une surveillance minutieuse et concrète du système de justice administrative tout en respectant la légitimité de celui-ci et le point de vue des décideurs spécialisés de première ligne.

Application à M. Vavilov

[314] Alexander Vavilov conteste la décision de la greffière de la citoyenneté d'annuler son certificat de citoyenneté. La greffière a conclu que M. Vavilov n'était pas un citoyen canadien et que, par conséquent, il n'avait pas droit à un certificat de citoyenneté canadienne parce que, même s'il est né au Canada, ses parents étaient [TRADUCTION] « représentant[s] ou au service d'un gouvernement étranger » au sens de l'al. 3(2)a) de la *Loi sur la citoyenneté*, L.R.C. 1985, c. C-29.

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[315] The first issue is the applicable standard of review. We agree with the majority that reasonableness applies.

[316] The second issue is whether the Registrar was reasonable in concluding that the exception to Canadian citizenship in s. 3(2)(a) applies not only to parents who enjoy diplomatic privileges and immunities, but also to intelligence agents of a foreign government. The onus is therefore on Mr. Vavilov to satisfy the reviewing court that the decision was unreasonable. In our view, he has met that onus.

[317] Mr. Vavilov was born in Canada in 1994. His Russian parents, Elena Vavilova and Andrey Bezrukov, entered Canada at some point prior to his birth, assumed the identities of two deceased Canadians and fraudulently obtained Canadian passports. After leaving Canada to live in France, Mr. Vavilov and his family moved to the United States. While in the United States, Mr. Vavilov's parents became American citizens under their assumed Canadian identities. Mr. Vavilov and his older brother also obtained American citizenship.

[318] In June 2010, agents of the United States Federal Bureau of Investigation arrested Mr. Vavilov's parents and charged them with conspiracy to act as unregistered agents of a foreign government and to commit money laundering. Mr. Vavilov's parents pleaded guilty to the conspiracy charges in July 2010 and were returned to Russia in a spy swap. Around the same time, Mr. Vavilov and his brother travelled to Russia. The American government subsequently revoked Mr. Vavilov's passport and citizenship. In December 2010, he was issued a Russian passport and birth certificate.

[319] From 2010 to 2013, Mr. Vavilov repeatedly sought a Canadian passport. In December 2011, he obtained an amended Ontario birth certificate, showing

[315] La première question à trancher est de savoir quelle est la norme de contrôle applicable. Nous convenons avec la majorité que la norme de la décision raisonnable s'applique.

[316] La seconde question à trancher est de savoir s'il était raisonnable pour la greffière de conclure que l'exception à la règle de la citoyenneté canadienne prévue à l'al. 3(2)a) s'appliquait non seulement aux parents qui bénéficient de privilèges et d'immunités diplomatiques, mais aussi aux agents du renseignement d'un gouvernement étranger. Il incombe donc à M. Vavilov de convaincre la cour de révision que la décision était déraisonnable. À notre avis, il s'est acquitté de ce fardeau.

[317] Monsieur Vavilov est né au Canada en 1994. Ses parents, Elena Vavilova et Andrey Bezrukov, des citoyens russes, sont entrés au Canada quelque temps avant sa naissance, ont usurpé l'identité de deux Canadiens décédés et ont obtenu frauduleusement des passeports canadiens. Après avoir quitté le Canada pour aller vivre en France, M. Vavilov et sa famille ont déménagé aux États-Unis. Pendant qu'ils se trouvaient aux États-Unis, les parents de M. Vavilov ont acquis la citoyenneté américaine grâce à leur fausse identité canadienne. Monsieur Vavilov et son frère aîné ont également obtenu la citoyenneté américaine.

[318] En juin 2010, des agents du Federal Bureau of Investigation des États-Unis ont arrêté les parents de M. Vavilov et les ont accusés de complot en vue d'agir en tant qu'agents non accrédités d'un gouvernement étranger et en vue de se livrer au blanchiment d'argent. Les parents de M. Vavilov ont plaidé coupable à des accusations de complot en juillet 2010 et ont été renvoyés en Russie dans le cadre d'un échange d'espions. Vers la même période, M. Vavilov et son frère se sont rendus en Russie. Le gouvernement américain a subséquemment révoqué le passeport et la citoyenneté de M. Vavilov, qui s'est vu délivrer, en décembre 2010, un passeport et un acte de naissance russes.

[319] De 2010 à 2013, M. Vavilov a tenté à de nombreuses reprises d'obtenir un passeport canadien. En décembre 2011, les autorités ontariennes lui

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his parents' true names and places of birth. Using this birth certificate, Mr. Vavilov applied for and received a certificate of Canadian citizenship in January 2013. Relying on these certificates, Mr. Vavilov applied for an extension of his Canadian passport in early 2013. On July 18, 2013, the Registrar wrote to Mr. Vavilov, informing him that there was reason to believe the citizenship certificate had been erroneously issued and asking him for additional information.

[320] On April 22, 2014, Mr. Vavilov provided extensive written submissions to the Registrar. He argued that the narrow exception set out in s. 3(2) of the Act does not apply to him. Because he was born in Canada, he is entitled to Canadian citizenship. Mr. Vavilov also argued that the Registrar had failed to respect the requirements of procedural fairness.

[321] The Registrar wrote to Mr. Vavilov on August 15, 2014, cancelling his certificate of Canadian citizenship. In her view, because Mr. Vavilov met the two statutory restrictions in s. 3(2) of the Act, he was not a Canadian citizen. First, when Mr. Vavilov was born in Canada, neither of his parents were Canadian citizens or lawfully admitted to Canada for permanent residence. Second, as unofficial agents working for Russia's Foreign Intelligence Service, Mr. Vavilov's parents were "other representative[s] or employee[s] in Canada of a foreign government" within the meaning of s. 3(2)(a).

[322] The Federal Court ([2016] 2 F.C.R. 39) dismissed Mr. Vavilov's application for judicial review. It found that the Registrar had satisfied the requirements of procedural fairness and, applying a correctness standard, determined that the Registrar's interpretation of s. 3(2)(a) was correct. The Federal Court then reviewed the application of s. 3(2)(a) on a reasonableness standard and concluded that the Registrar had reasonably determined that Mr. Vavilov's parents were working in Canada as undercover agents of the Russian government at the time of his birth.

ont délivré un nouvel acte de naissance qui indiquait les vrais noms et lieux de naissance de ses parents. Sur la foi de cet acte de naissance, M. Vavilov a demandé et obtenu un certificat de citoyenneté canadienne en janvier 2013. À l'aide de ces documents, M. Vavilov a demandé la prolongation du délai de validité de son passeport canadien au début de l'année 2013. Le 18 juillet 2013, la greffière a écrit à M. Vavilov pour l'informer qu'il y avait lieu de croire que son certificat de citoyenneté avait été délivré par erreur et l'a invité à fournir des renseignements supplémentaires.

[320] Le 22 avril 2014, M. Vavilov a fait parvenir à la greffière de longues observations écrites dans lesquelles il soutenait que l'exception restreinte prévue au par. 3(2) de la Loi ne s'appliquait pas à lui. Comme il était né au Canada, il avait droit à la citoyenneté canadienne. Monsieur Vavilov a également fait valoir que la greffière n'avait pas respecté les exigences de l'équité procédurale.

[321] Dans une lettre datée du 15 août 2014, la greffière a informé M. Vavilov qu'elle annulait son certificat de citoyenneté canadienne. À son avis, étant donné que M. Vavilov tombait sous le coup des deux restrictions énoncées au par. 3(2) de la Loi, il n'était pas un citoyen canadien. En premier lieu, lorsque M. Vavilov est né au Canada, ses parents n'avaient qualité ni de citoyens canadiens ni de résidents permanents. En second lieu, à titre d'agents non officiels travaillant pour le Service des renseignements extérieurs russe, les parents de M. Vavilov étaient [TRADUCTION] « représentant[s] ou au service d'un gouvernement étranger » au sens de l'al. 3(2)a).

[322] La Cour fédérale ([2016] 2 R.C.F. 39) a rejeté la demande de contrôle judiciaire de M. Vavilov. Elle a conclu que la greffière avait respecté les exigences de l'équité procédurale et, appliquant la norme de la décision correcte, elle a jugé que la greffière avait interprété correctement l'al. 3(2)a). La Cour fédérale a par la suite examiné l'application de cet alinéa selon la norme de la décision raisonnable et jugé qu'il était raisonnable de la part de la greffière de conclure que les parents de M. Vavilov travaillaient au Canada en qualité d'agents d'infiltration du gouvernement russe au moment de sa naissance.

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[323] The Federal Court of Appeal ([2018] 3 F.C.R. 75) allowed the appeal and quashed the Registrar's decision to cancel Mr. Vavilov's citizenship certificate. Writing for the majority, Stratas J.A. agreed that the requirements of procedural fairness were met but held that the Registrar's interpretation of s. 3(2)(a) was unreasonable. In his view, only those who enjoy diplomatic privileges and immunities fall within the exception to citizenship found in s. 3(2)(a). Justice Stratas reached this conclusion after considering the context and purpose of the provision, its legislative history and international law principles related to citizenship and diplomatic privileges and immunities.

[324] As a general rule, administrative decisions are to be judicially reviewed for reasonableness. None of the correctness exceptions apply to the Registrar's interpretation of the Act in this case. As such, the standard of review is reasonableness.

[325] The following provisions of the *Citizenship Act* are relevant to this appeal:

Persons who are citizens

3 (1) Subject to this Act, a person is a citizen if

(a) the person was born in Canada after February 14, 1977;

. . .

Not applicable to children of foreign diplomats, etc.

(2) Paragraph (1)(a) does not apply to a person if, at the time of his birth, neither of his parents was a citizen or lawfully admitted to Canada for permanent residence and either of his parents was

(a) a diplomatic or consular officer or other representative or employee in Canada of a foreign government;

[323] La Cour d'appel fédérale ([2018] 3 R.C.F. 75) a fait droit à l'appel et a cassé la décision par laquelle la greffière avait annulé le certificat de citoyenneté de M. Vavilov. S'exprimant au nom de la majorité, le juge Stratas a reconnu que les exigences de l'équité procédurale avaient été respectées, mais a estimé que l'interprétation donnée à l'al. 3(2)a) par la greffière n'était pas raisonnable. À son avis, seules les personnes qui jouissent de privilèges et d'immunités diplomatiques étaient visées par l'exception prévue à l'al. 3(2)a). Le juge Stratas est parvenu à cette conclusion après avoir examiné le contexte et l'objet de la disposition, son origine législative et les principes du droit international relatifs à la citoyenneté et aux privilèges et immunités diplomatiques.

[324] En règle générale, il faut contrôler judiciairement les décisions administratives pour juger de leur caractère raisonnable. Aucune des exceptions justifiant le recours à la norme de la décision correcte ne s'applique à l'interprétation par la greffière de la Loi en espèce. En conséquence, la norme de contrôle applicable est celle de la décision raisonnable.

[325] Les dispositions suivantes de la *Loi sur la citoyenneté* sont pertinentes en l'espèce :

Citoyens

3 (1) Sous réserve des autres dispositions de la présente loi, a qualité de citoyen toute personne :

a) née au Canada après le 14 février 1977;

. . .

Inapplicabilité aux enfants de diplomates étrangers, etc.

(2) L'alinéa (1)a) ne s'applique pas à la personne dont, au moment de la naissance, les parents n'avaient qualité ni de citoyens ni de résidents permanents et dont le père ou la mère était :

a) agent diplomatique ou consulaire, représentant à un autre titre ou au service au Canada d'un gouvernement étranger;

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(b) an employee in the service of a person referred to in paragraph (a); or

(c) an officer or employee in Canada of a specialized agency of the United Nations or an officer or employee in Canada of any other international organization to whom there are granted, by or under any Act of Parliament, diplomatic privileges and immunities certified by the Minister of Foreign Affairs to be equivalent to those granted to a person or persons referred to in paragraph (a).

b) au service d'une personne mentionnée à l'alinéa a);

c) fonctionnaire ou au service, au Canada, d'une organisation internationale — notamment d'une institution spécialisée des Nations Unies — bénéficiant sous le régime d'une loi fédérale de privilèges et immunités diplomatiques que le ministre des Affaires étrangères certifie être équivalents à ceux dont jouissent les personnes visées à l'alinéa a).

The general rule embodied in s. 3(1)(a) of the Act is that persons born in Canada are Canadian citizens. Section 3(2) sets out an exception to this rule. As such, if s. 3(2) applies to Mr. Vavilov, he was never a Canadian citizen.

Suivant la règle générale énoncée à l'al. 3(1)a) de la Loi, les personnes nées au Canada ont qualité de citoyens canadiens. Le paragraphe 3(2) prévoit une exception à cette règle, de sorte que, si cette disposition s'applique à M. Vavilov, celui-ci n'a jamais été citoyen canadien.

[326] The specific issue in this case is whether the Registrar's interpretation of the statutory exception to citizenship was reasonable. Reasonableness review entails deference to the decision-maker, and we begin our analysis by examining the reasons offered by the Registrar in light of the context and the grounds argued.

[326] La question précise à trancher en l'espèce est de savoir si l'interprétation que la greffière a donnée à l'exception prévue par la Loi à la règle de la citoyenneté était raisonnable. Le contrôle effectué en fonction de la norme de la décision raisonnable commande la déférence à l'endroit du décideur et nous débutons notre analyse en examinant les motifs invoqués par la greffière à la lumière du contexte et des moyens plaidés.

[327] In this case, the Registrar's letter to Mr. Vavilov summarized the key points underlying her decision. In concluding that Mr. Vavilov was not entitled to Canadian citizenship, the Registrar adopted the recommendations of an analyst employed by Citizenship and Immigration Canada. As such, the analyst's report properly forms part of the reasons supporting the Registrar's decision.

[327] Dans le cas qui nous occupe, la greffière a résumé, dans la lettre qu'elle a adressée à M. Vavilov, les principaux motifs à l'appui de sa décision. En concluant que M. Vavilov n'avait pas droit à la citoyenneté canadienne, la greffière a fait sienne les recommandations d'une analyste qui travaillait pour Citoyenneté et Immigration Canada. Ce rapport fait partie à juste titre des motifs à l'appui de la décision de la greffière.

[328] The analyst's report sought to answer the question of whether Mr. Vavilov was erroneously issued a certificate of Canadian citizenship. The report identifies the key question in this case as being whether either of Mr. Vavilov's parents was a "representative" or "employee" of a foreign government within the meaning of s. 3(2)(a). Much of the report relates to matters not disputed in this appeal, including the legal status of Mr. Vavilov's parents

[328] Dans son rapport, l'analyste a tenté de répondre à la question de savoir si un certificat de citoyenneté canadienne avait été délivré par erreur à M. Vavilov. Elle a également précisé que la question clé à trancher en l'espèce était celle de savoir si le père ou la mère de M. Vavilov était un « représentant à un autre titre ou au service » d'un gouvernement étranger au sens de l'al. 3(2)a). Une bonne partie du rapport traite de questions qui ne sont pas contestées

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in Canada and their employment as Russian intelligence agents.

[329] The analyst began her analysis with the text of s. 3(2)(a). In concluding that the provision operates to deny Mr. Vavilov Canadian citizenship, she set out two textual arguments. First, she compared the current version of s. 3(2)(a) to an earlier iteration of the exception found in s. 5(3) of the *Canadian Citizenship Act*, R.S.C. 1970, c. C-19:

Not applicable to children of foreign diplomats, etc.

(3) Subsection (1) does not apply to a person if, at the time of that person's birth, his responsible parent

(*a*) is an alien who has not been lawfully admitted to Canada for permanent residence; and

(*b*) is

(i) a foreign diplomatic or consular officer or a representative of a foreign government accredited to Her Majesty,

(ii) an employee of a foreign government attached to or in the service of a foreign diplomatic mission or consulate in Canada, or

(iii) an employee in the service of a person referred to in subparagraph (i).

[330] The analyst stated that the removal of references to official accreditation or a diplomatic mission indicate that the previous exception was narrower than s. 3(2)(a). She then pointed out that the definition of "diplomatic or consular officer" in s. 35(1) of the *Interpretation Act*, R.S.C. 1985, c. I-21, clearly associates these individuals with diplomatic positions. Because the current version of s. 3(2)(a) does not link "other representative or employee in Canada of a foreign government" to a diplomatic mission, the analyst determined "it is reasonable to maintain

dans le présent pourvoi, dont celle du statut juridique des parents de M. Vavilov au Canada et de leur emploi comme agents du renseignement russes.

[329] L'analyste a débuté son analyse par un examen du libellé de l'al. 3(2)a). Pour conclure que cette disposition avait pour effet d'empêcher M. Vavilov d'obtenir la citoyenneté canadienne, elle a invoqué deux arguments tirés du texte. D'abord, elle a comparé la version actuelle de l'al. 3(2)a) actuel à une version antérieure de l'exception énoncée au par. 5(3) de la *Loi sur la citoyenneté canadienne*, S.R.C. 1970, c. C-19 :

Ne s'applique pas aux enfants de diplomates étrangers, etc.

(3) Le paragraphe (1) ne s'applique pas à une personne si, au moment de la naissance de cette personne, son parent responsable

a) était un étranger n'ayant pas été licitement admissibilité au Canada pour y résider en permanence; et

b) était

(i) un agent diplomatique ou consulaire étranger ou un représentant d'un gouvernement étranger accrédité auprès de Sa Majesté,

(ii) un employé d'un gouvernement étranger, attaché à une mission diplomatique ou à un consulat au Canada, ou au service d'une telle mission ou d'un tel consulat, ou

(iii) un employé au service d'une personne mentionnée au sous-alinéa (i).

[330] L'analyste a affirmé que la suppression des mentions d'accréditation officielle et de mission diplomatique permettait de penser que l'ancienne exception avait une portée plus étroite que l'exception actuelle prévue à l'al. 3(2)a). Elle a ensuite souligné que la définition du terme « agent diplomatique ou consulaire » figurant au par. 35(1) de la *Loi d'interprétation*, L.R.C. 1985, c. I-21, associe clairement cette personne à un poste diplomatique. Étant donné que la version actuelle de l'al. 3(2)a) n'associe pas les « représentant[s] à un autre titre ou au service au

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that this provision intends to encompass individuals not included in the definition of 'diplomatic and consular staff.'" Finally, the analyst stated that the phrase "other representative or employee in Canada of a foreign government" has not been previously interpreted by a court.

[331] Beyond the analyst's report, there is little in the record to supplement the Registrar's reasons. There is no evidence about whether the Registrar has previously applied this provision to individuals like Mr. Vavilov, whose parents did not enjoy diplomatic privileges and immunities. Neither does there appear to be any internal policy, guideline or legal opinion to guide the Registrar in making these types of decisions.

[332] In challenging the Registrar's decision, Mr. Vavilov bears the onus of demonstrating why it is not reasonable. Before this Court, Mr. Vavilov submitted that the analyst focussed solely on the text of the exception to citizenship. In his view, had the broader objectives of s. 3(2)(a) been considered, the analyst would have concluded that "other representative" or "employee" only applies to individuals who benefit from diplomatic privileges and immunities.

[333] In his submissions before the Registrar, Mr. Vavilov offered three reasons why the text of s. 3(2) must be read against the backdrop of Canadian and international law relating to the roles and functions of diplomats.

[334] First, Mr. Vavilov explained that s. 3(2)(a) should be read in conjunction with the *Foreign Missions and International Organizations Act*, S.C. 1991, c. 41 ("*FMIOA*"). This statute incorporates into Canadian law aspects of the *Vienna Convention on Diplomatic Relations*, Can. T.S. 1966 No. 29, Sched. I to the *FMIOA*, and the *Vienna Convention on Consular*

Canada d'un gouvernement étranger » à une mission diplomatique, l'analyste a conclu [TRADUCTION] « [qu']il est raisonnable de soutenir que cette disposition est censée englober les personnes qui ne sont pas visées par la définition du terme "[personnel] diplomatique et consulaire" ». Enfin, l'analyste a souligné que l'expression « représentant à un autre titre ou au service au Canada d'un gouvernement étranger » n'avait pas encore été interprétée par les cours.

[331] Hormis le rapport de l'analyste, le dossier renferme peu d'éléments étoffant les motifs de la greffière. Il n'y a aucun élément de preuve permettant de savoir si la greffière a déjà appliqué cette disposition à des personnes comme M. Vavilov, dont les parents ne jouissaient pas de privilèges ou d'immunités diplomatiques. Il ne semble pas y avoir non plus de politiques, de lignes directrices ou d'avis juridiques internes qui auraient pu aider la greffière à prendre ce type de décision.

[332] Pour contester la décision de la greffière, il incombe à M. Vavilov de démontrer pourquoi cette décision n'est pas raisonnable. Devant notre Cour, M. Vavilov a soutenu que l'analyste s'est fondée uniquement sur le texte de l'exception à la règle de la citoyenneté. De l'avis de M. Vavilov, si l'analyste avait tenu compte des objectifs plus larges de l'al. 3(2)a), elle aurait conclu que les mots « représentant » et « au service » ne s'appliquent qu'aux personnes qui jouissent de privilèges et d'immunités diplomatiques.

[333] Dans les arguments qu'il a présentés à la greffière, M. Vavilov a invoqué trois raisons pour lesquelles le libellé du par. 3(2) devait être interprété à la lumière des règles du droit canadien et du droit international concernant le rôle et les fonctions des diplomates.

[334] D'abord, M. Vavilov a expliqué que l'al. 3(2)a) devrait être interprété en corrélation avec la *Loi sur les missions étrangères et les organisations internationales*, L.C. 1991, c. 41 (la *LMEOI*). Cette loi incorpore en droit canadien des aspects de la *Convention de Vienne sur les relations diplomatiques*, R.T. Can. 1966, nº 29, ann. I de la *LMEOI*, et de la *Convention de*

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Relations, Can. T.S. 1974 No. 25, Sched. II to the *FMIOA*, which deal with diplomatic privileges and immunities. He submitted that s. 3(2) denies citizenship to children of diplomats because diplomatic privileges and immunities, including immunity from criminal prosecution and civil liability, are inconsistent with the duties and responsibilities of a citizen. Because Mr. Vavilov's parents did not enjoy such privileges and immunities, there would be no purpose in excluding their children born in Canada from becoming Canadian citizens.

[335] Second, Mr. Vavilov provided the Registrar with Hansard committee meeting minutes such as the comments of the Hon. J. Hugh Faulkner, Secretary of State, when introducing the amendments to s. 3(2), who explained that the provision had been redrafted to narrow the exception to citizenship.

[336] Third, Mr. Vavilov cited case law, arguing that: (i) the exception to citizenship should be narrowly construed because it takes away substantive rights (*Brossard (Town) v. Quebec Commission des droits de la personne*, [1988] 2 S.C.R. 279, at p. 307); (ii) s. 3(2)(a) must be interpreted functionally and purposively (*Medovarski v. Canada (Minister of Citizenship and Immigration)*, [2005] 2 S.C.R. 539, at para. 8); and (iii) because Mr. Vavilov's parents were not immune from criminal or civil proceedings, they fall outside the scope of s. 3(2) (*Greco v. Holy See (State of the Vatican City)*, [1999] O.J. No. 2467 (QL) (S.C.J.); *R. v. Bonadie* (1996), 109 C.C.C. (3d) 356 (Ont. C.J.); *Al-Ghamdi v. Canada (Minister of Foreign Affairs and International Trade)* (2007), 64 Imm. L.R. (3d) 67 (F.C.)).

[337] The Federal Court's decision in *Al-Ghamdi*, a case which challenged the constitutionality of s. 3(2)(a), was particularly relevant. In that case, Shore J. wrote that s. 3(2)(a) only applies to the "children of individuals with diplomatic status" (paras. 5 and 65). Justice Shore also stated that "[i]t is precisely because of the vast array of privileges

Vienne sur les relations consulaires, R.T. Can. 1974, nº 25, ann. II de la *LMEOI*, qui portent sur les privilèges et immunités diplomatiques. Monsieur Vavilov a soutenu que le par. 3(2) empêchait les enfants de diplomates d'acquérir la citoyenneté, parce que les privilèges et immunités diplomatiques, y compris l'immunité contre les poursuites criminelles et la responsabilité civile, étaient incompatibles avec les obligations et les responsabilités de la citoyenneté. Étant donné que les parents de M. Vavilov ne bénéficiaient pas de privilèges et d'immunités de cette nature, il ne servirait à rien d'empêcher leurs enfants nés au Canada de devenir des citoyens canadiens.

[335] En deuxième lieu, M. Vavilov a remis à la greffière des procès-verbaux de réunions de comités publiés dans le Hansard, comme les explications qu'avait données l'hon. J. Hugh Faulkner, secrétaire d'État, lors du dépôt des modifications proposées au par. 3(2), et selon lesquelles le législateur avait récrit la disposition afin de limiter la portée de l'exception à la règle de la citoyenneté.

[336] En troisième lieu, M. Vavilov a cité des décisions judiciaires pour soutenir : (i) que l'exception à la règle de la citoyenneté devrait être interprétée de façon restrictive, parce qu'elle supprime des droits substantiels (*Brossard c. Québec*, [1988] 2 R.C.S. 279, p. 307), (ii) que l'al. 3(2)a) devait recevoir une interprétation fonctionnelle et fondée sur son objet (*Medovarski c. Canada (Ministre de la Citoyenneté et de l'Immigration)*, [2005] 2 R.C.S. 539, par. 8), et (iii) que, étant donné que les parents de M. Vavilov ne bénéficiaient pas de l'immunité à l'égard des poursuites criminelles et civiles, ils n'étaient pas visés par le par. 3(2) (*Greco c. Holy See (State of the Vatican City)*, [1999] O.J. No. 2467 (QL) (C.S.J.); *R. c. Bonadie* (1996), 109 C.C.C. (3d) 356 (C.J. Ont.); *Al-Ghamdi c. Canada (Ministre des Affaires étrangères et du Commerce international*), 2007 CF 559).

[337] La décision que la Cour fédérale a rendue dans l'affaire *Al-Ghamdi*, qui portait sur la constitutionnalité de l'al. 3(2)a), est particulièrement pertinente. Dans cette décision, le juge Shore a écrit en effet que l'al. 3(2)a) s'appliquait uniquement aux « enfants de personnes ayant le statut diplomatique » (par. 5 et 65). Le juge Shore a ajouté ce qui suit :

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accorded to diplomats and their families, which are by their very nature inconsistent with the obligations of citizenship, that a person who enjoys diplomatic status cannot acquire citizenship" (para. 63).

[338] The Registrar's reasons failed to respond to Mr. Vavilov's extensive and compelling submissions about the objectives of s. 3(2)(a). It appears that the analyst misunderstood Mr. Vavilov's arguments on this point. In discussing the scope of s. 3(2), she wrote, "[c]ounsel argues that CIC [Citizenship and Immigration Canada] cannot invoke subsection 3(2) because CIC has not requested or obtained verification with the Foreign Affairs Protocol to prove that [Mr. Vavilov's parents] held diplomatic or consular status with the Russian Federation while they resided in Canada." It thus appears that the analyst did not recognize that Mr. Vavilov's argument was more fundamental in nature — namely, that the objectives of s. 3(2) require the terms "other representative" and "employee" to be read narrowly. During discovery, in fact, the analyst acknowledged that her research did not reveal a policy purpose behind s. 3(2)(a) or why the phrase "other representative or employee" was included in the Act. It also appears that the analyst did not understand the potential relevance of the *Al-Ghamdi* decision, since her report stated that "[t]he jurisprudence that does exist only relates to individuals whose parents maintained diplomatic status in Canada at the time of their birth."

[339] The Registrar, in the end, interpreted s. 3(2)(a) broadly, based on the analyst's purely textual assessment of the provision, including a comparison with the text of the previous version. This reading of "other representative or employee" was only reasonable if the text is read in isolation from its objective. Nothing in the history of this provision indicates that Parliament intended to widen its scope. Rather, as Mr. Vavilov points out, the modifications made to

« [c]'est précisément en raison de la vaste gamme de privilèges dont jouissent les diplomates et leur famille, privilèges qui sont de par leur nature même incompatibles avec les obligations de la citoyenneté, qu'une personne qui jouit du statut diplomatique ne peut acquérir la citoyenneté » (par. 63).

[338] Dans ses motifs, la greffière n'a pas répondu aux arguments abondants et convaincants que M. Vavilov a invoqués au sujet des objectifs de l'al. 3(2)a). Il semble que l'analyste ait mal compris les arguments de M. Vavilov sur ce point. Commentant la portée du par. 3(2), l'analyste s'est exprimée comme suit : [TRADUCTION] « l'avocat soutient que [Citoyenneté et Immigration Canada] ne peut invoquer le par. 3(2), parce que le Ministère n'a pas demandé ou obtenu une vérification auprès du Bureau du protocole d'Affaires étrangères afin de prouver que les parents de M. Vavilov détenaient un statut diplomatique ou consulaire auprès de la Fédération russe pendant qu'ils résidaient au Canada ». Il semble donc que l'analyste n'a pas reconnu que l'argument de M. Vavilov revêtait un caractère plus fondamental, soit que les objectifs du par. 3(2) exigent une interprétation restrictive des mots « représentant » et « au service ». Pendant son interrogatoire préalable, l'analyste a effectivement reconnu que sa recherche ne lui avait pas permis de déterminer l'objectif de politique générale qui sous-tend l'al. 3(2)a) ou les raisons pour lesquelles les mots « représentant » et « au service » avaient été inclus dans la Loi. Il semble également que l'analyste n'ait pas saisi la pertinence possible de la décision *Al-Ghamdi*, étant donné qu'elle a mentionné dans son rapport que [TRADUCTION] « les décisions rendues jusqu'à maintenant concernent uniquement les personnes dont, au moment de la naissance, les parents détenaient un statut diplomatique au Canada ».

[339] En fin de compte, la greffière a donné une interprétation large à l'al. 3(2)a) en se fondant sur l'analyse purement textuelle que l'analyste en avait faite, notamment en le comparant avec le texte de la version antérieure. Cette interprétation des mots « représentant à un autre titre ou au service » n'était raisonnable que si l'on examinait le texte en faisant abstraction de son objectif. L'historique de la disposition n'indique nullement que le législateur fédéral

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s. 3(2) in 1976 appear to mirror those embodied in the *Vienna Convention on Diplomatic Relations* and the *Vienna Convention on Consular Relations*, which were incorporated into Canadian law in 1977. The judicial treatment of this provision, in particular the statements in *Al-Ghamdi* about the narrow scope of s. 3(2)(a) and the inconsistency between diplomatic privileges and immunities and citizenship, also points to the need for a narrow interpretation of the exception to citizenship.

[340] In addition, as noted by the majority of the Federal Court of Appeal, the text of s. 3(2)(c) can be seen as undermining the Registrar's interpretation. That provision denies citizenship to children born to individuals who enjoy "diplomatic privileges and immunities certified by the Minister of Foreign Affairs to be equivalent to those granted to a person or persons referred to in paragraph (a)". As Stratas J.A. noted, this language suggests that s. 3(2)(a) covers *only* those "employee[s] in Canada of a foreign government" who have diplomatic privileges and immunities.

[341] By ignoring the objectives of the provision, the Registrar rendered an unreasonable decision. In particular, the arguments supporting a reading of s. 3(2) that is restricted to those who have diplomatic privileges and immunities, likely would have changed the outcome in this case.

[342] Mr. Vavilov has satisfied us that the Registrar's decision is unreasonable. As a result, the Court of Appeal properly quashed the Registrar's decision to cancel Mr. Vavilov's citizenship certificate, and he is thus entitled to a certificate of Canadian citizenship.

[343] We would therefore dismiss the appeal with costs to Mr. Vavilov throughout.

avait l'intention d'en élargir le champ d'application. Ainsi que le souligne M. Vavilov, les modifications apportées au par. 3(2) en 1976 semblent plutôt refléter celles qui ont été intégrées dans la *Convention de Vienne sur les relations diplomatiques* et dans la *Convention de Vienne sur les relations consulaires*, toutes deux incorporées en droit canadien en 1977. La façon dont les cours ont interprété cette disposition, notamment les remarques formulées dans la décision *Al-Ghamdi* au sujet de la portée restreinte de l'al. 3(2)a) et de l'incompatibilité entre la citoyenneté et les privilèges et immunités diplomatiques, indique elle aussi qu'il faut interpréter restrictivement l'exception à la règle de la citoyenneté.

[340] Qui plus est, ainsi que l'a fait remarquer la majorité de la Cour d'appel fédérale, le libellé de l'al. 3(2)c) peut être perçu comme sapant l'interprétation de la greffière. Cette disposition nie le droit à la citoyenneté aux enfants nés de personnes bénéficiant de « privilèges et immunités diplomatiques que le ministre des Affaires étrangères certifie être équivalents à ceux dont jouissent les personnes visées à l'alinéa a) ». Ainsi que l'a souligné le juge Stratas, ce texte laisse croire que l'al. 3(2)a) *ne* vise donc *que* les personnes « au service au Canada d'un gouvernement étranger » qui jouissent de privilèges et immunités diplomatiques.

[341] En ignorant les objectifs de la disposition, la greffière a rendu une décision déraisonnable. Plus précisément, la prise en compte des arguments appuyant une interprétation selon laquelle le par. 3(2) s'applique uniquement aux personnes jouissant de privilèges et d'immunités diplomatiques aurait vraisemblablement modifié l'issue de l'affaire.

[342] Monsieur Vavilov nous a convaincues que la décision de la greffière est déraisonnable. En conséquence, la Cour d'appel a cassé à bon droit la décision par laquelle la greffière avait annulé le certificat de citoyenneté de M. Vavilov, qui a donc droit à un certificat de citoyenneté canadienne.

[343] Par conséquent, nous rejetterions le pourvoi avec dépens devant toutes les cours en faveur de M. Vavilov.

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Appeal dismissed with costs throughout.

Solicitor for the appellant: Attorney General of Canada, Toronto.

Solicitors for the respondent: Jackman Nazami & Associates, Toronto; University of Windsor — Faculty of Law, Windsor.

Solicitor for the intervener the Attorney General of Ontario: Attorney General of Ontario, Toronto.

Solicitor for the intervener the Attorney General of Quebec: Attorney General of Quebec, Québec.

Solicitor for the intervener the Attorney General of British Columbia: Attorney General of British Columbia, Victoria.

Solicitor for the intervener the Attorney General of Saskatchewan: Attorney General of Saskatchewan, Regina.

Solicitor for the intervener the Canadian Council for Refugees: The Law Office of Jamie Liew, Ottawa.

Solicitor for the intervener the Advocacy Centre for Tenants Ontario - Tenant Duty Counsel Program: Advocacy Centre for Tenants Ontario, Toronto.

Solicitor for the interveners the Ontario Securities Commission, the British Columbia Securities Commission and the Alberta Securities Commission: Ontario Securities Commission, Toronto.

Solicitor for the intervener Ecojustice Canada Society: Ecojustice Canada Society, Toronto.

Solicitor for the interveners the Workplace Safety and Insurance Appeals Tribunal (Ontario), the Workers' Compensation Appeals Tribunal (Northwest Territories and Nunavut), the Workers' Compensation Appeals Tribunal (Nova Scotia), the Appeals

Pourvoi rejeté avec dépens dans toutes les juridictions.

Procureur de l'appelant : Procureur général du Canada, Toronto.

Procureurs de l'intimé : Jackman Nazami & Associates, Toronto; University of Windsor — Faculty of Law, Windsor.

Procureur de l'intervenant le procureur général de l'Ontario : Procureur général de l'Ontario, Toronto.

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Commission for Alberta Workers' Compensation and the Workers' Compensation Appeals Tribunal (New Brunswick): Workplace Safety and Insurance Appeals Tribunal, Toronto.

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Solicitors for the intervener the Council of Canadian Administrative Tribunals: Lax O'Sullivan Lisus Gottlieb, Toronto.

Solicitors for the interveners the National Academy of Arbitrators, the Ontario Labour-Management Arbitrators' Association and Conférence des arbitres du Québec: Susan L. Stewart, Toronto; Paliare Roland Rosenberg Rothstein, Toronto; Rae Christen Jeffries, Toronto.

Solicitors for the intervener the Canadian Labour Congress: Goldblatt Partners, Toronto.

Solicitors for the intervener the National Association of Pharmacy Regulatory Authorities: Shores Jardine, Edmonton.

Solicitors for the intervener Queen's Prison Law Clinic: Stockwoods, Toronto.

Solicitors for the intervener Advocates for the Rule of Law: McCarthy Tétrault, Vancouver.

Solicitor for the intervener the Parkdale Community Legal Services: Parkdale Community Legal Services, Toronto.

Solicitors for the intervener the Cambridge Comparative Administrative Law Forum: Cambridge University — The Faculty of Law, Cambridge, U.K.; White & Case, Washington, D.C.

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Procureurs des intervenantes National Academy of Arbitrators, Ontario Labour-Management Arbitrators' Association et la Conférence des arbitres du Québec : Susan L. Stewart, Toronto; Paliare Roland Rosenberg Rothstein, Toronto; Rae Christen Jeffries, Toronto.

Procureurs de l'intervenant le Congrès du travail du Canada : Goldblatt Partners, Toronto.

Procureurs de l'intervenante l'Association nationale des organismes de réglementation de la pharmacie : Shores Jardine, Edmonton.

Procureurs de l'intervenante Queen's Prison Law Clinic : Stockwoods, Toronto.

Procureurs de l'intervenant Advocates for the Rule of Law : McCarthy Tétrault, Vancouver.

Procureur de l'intervenant Parkdale Community Legal Services : Parkdale Community Legal Services, Toronto.

Procureurs de l'intervenant Cambridge Comparative Administrative Law Forum : Cambridge University — The Faculty of Law, Cambridge, R.-U.; White & Case, Washington, D.C.

Procureurs de l'intervenante la Clinique d'intérêt public et de politique d'internet du Canada Samuelson-Glushko : Caza Saikaley, Ottawa.

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Solicitor for the intervener the Community & Legal Aid Services Programme: Community & Legal Aid Services Programme, Toronto.

Solicitors for the intervener Association québécoise des avocats et avocates en droit de l'immigration: Nguyen, Tutunjian & Cliche-Rivard, Montréal; Hadekel Shams, Montréal.

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Procureur de l'intervenant Community & Legal Aid Services Programme : Community & Legal Aid Services Programme, Toronto.

Procureurs de l'intervenante l'Association québécoise des avocats et avocates en droit de l'immigration : Nguyen, Tutunjian & Cliche-Rivard, Montréal; Hadekel Shams, Montréal.

Procureurs de l'intervenante la Société de soutien à l'enfance et à la famille des Premières Nations du Canada : Stikeman Elliott, Ottawa.

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Compliance and Enforcement Policy

Program Policy Integration Division
Policy and Programs Branch
Canadian Food Inspection Agency

November 1, 2020
RDIMS 11487825

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1.0 Background

The mandate of the Canadian Food Inspection Agency (CFIA) is to safeguard food, animals and plants that enhance the health and well-being of Canada's people. CFIA achieves this mandate by setting requirements in legislation. It is the legal responsibility of regulated parties to comply with all the legislative requirements that apply to them.

This Compliance and Enforcement Policy outlines CFIA's approach to compliance with, and enforcement of, its legislation. Canadians and Canadian industry want a reliable and credible system that protects plant and animal health and food safety. There is an expectation that contraventions of the law will be met with meaningful and appropriate compliance and enforcement actions, which contributes to maintaining public trust. Compliance and enforcement actions taken by the Agency are part of a continuum – CFIA's Compliance and Enforcement Continuum (for more information, please consult Appendix A), which includes:

- **Compliance promotion** - consultation, communication, information, tools and processes to help regulated parties understand and comply with regulatory requirements;
- **Compliance verification** - CFIA assessment of regulated party compliance by conducting inspections, taking samples, testing, etc., to verify that requirements are being met;
- **Regulatory response** - CFIA response when regulated parties do not comply and/or a risk needs to be controlled; and
- **Recourse and feedback mechanisms** - regulated party recourse and feedback mechanisms.

CFIA supports compliance by providing regulated parties with the tools, resources, guidance, and services they may need to become familiar with and follow regulatory requirements. Using a risk-informed approach, the Agency conducts inspections to verify that regulatory requirements are being met. When they are not, CFIA may use control actions to address any immediate risk, as well as enforcement actions once non-compliance has been determined.

CFIA strives to be transparent and accountable in how it does business. In addition to providing regulated parties with recourse options, CFIA encourages continuous feedback and dialogue.

2.0 Policy statement

CFIA takes a strategic, consistent, fair, and transparent approach to verify that its compliance and enforcement actions and decisions support the effective delivery of its mandate.

3.0 Policy objectives

The objectives of this policy are to promote:

- increased awareness of the compliance and enforcement continuum applied by CFIA;
- a consistent application of regulatory control and enforcement procedures across CFIA; and
- increased compliance by regulated parties to legislation administered by CFIA.

4.0 Definitions

Definitions are included in Appendix B and a list of acronyms is provided in Appendix C.

5.0 Scope

This policy applies to the design, delivery and reporting of compliance and enforcement actions across CFIA's plant, animal and food business lines.

6.0 Authorities

CFIA is responsible for administering or enforcing the following Acts and their respective regulations:

- *Agriculture and Agri-Food Administrative Monetary Penalties Act*
- *Canadian Food Inspection Agency Act*
- *Feeds Act*
- *Fertilizers Act*
- *Food and Drugs Act (as it relates to food)*
- *Health of Animals Act*
- *Plant Protection Act*
- *Safe Food for Canadians Act*
- *Seeds Act*

7.0 Guiding principles

The following guiding principles support CFIA in achieving its compliance objectives:

7.1 Clarity

CFIA provides clear, concise and user-friendly information to regulated parties through its website and other communication activities.

7.2 Fairness, predictability and consistency

Compliance verification and enforcement program direction, guidance and procedures are applied nationally in order to achieve fairness, predictability and consistency.

Compliance verification and enforcement activities are carried out by trained, designated personnel in a manner consistent with the Agency's corporate values and ethics.

CFIA adheres to a compliance continuum (see Annex A) and this process contributes to fairness, predictability and consistency of compliance and enforcement activities.

7.3 Transparency

CFIA takes an open and transparent approach to its enforcement activities by providing Canadians with relevant, accurate and timely information on enforcement actions in a fair and consistent manner that respects legal requirements governing the public release of such information to maintain public trust.

Non-compliant regulated parties are made aware of the facts associated with violations or offences and are informed of available recourse and feedback mechanisms.

CFIA also encourages continuous feedback and dialogue through various mechanisms, including holding open consultations on its programs and services; and encouraging regulated parties to submit comments, compliments or complaints about quality of service, administrative errors or regulatory decisions to CFIA's Complaints and Appeals Office.

7.4 Risk-informed

CFIA selects the appropriate control and enforcement actions based on risk and the gravity of the non-compliance. As specific facts relating to cases of non-compliance may vary considerably, the enforcement actions applied may not be the same in each instance.

7.5 Results-oriented

Control and enforcement actions are selected to have the most positive impact on human, plant and animal health and safety outcomes based on the efficient and effective use of the Agency's resources whenever appropriate and possible.

Control and enforcement actions are carried out in a timely manner.

Control and enforcement actions are undertaken, managed and documented in a manner that facilitates efficacy reviews, performance assessments and continuous improvement.

CFIA uses performance measurement information to determine whether compliance and enforcement actions are working to improve compliance whenever appropriate and possible.

7.6 Right to recourse

Various recourse and feedback mechanisms are available to regulated parties who disagree or are not satisfied with a decision made by CFIA as set out under the law, including legislation that is administered and enforced by the Agency. Possible options available include:

- re-inspection (where authorized);
- opportunity to be heard (actions on permissions);
- appeal to the Assessor (animal or plant compensation);
- request a Ministerial Review (as it applies to the *Agriculture and Agri-Food Administrative Monetary Penalties (AAAMPs) Act*);
- appeal to the Canada Agricultural Review Tribunal (CART) (as it applies to the *AAAMPs Act* and Board of Arbitration Appeals);
- request a judicial review of a decision on an Administrative Monetary Penalty (AMP) from the Federal Court; and
- request a judicial review on decisions related to control and enforcement actions from the Federal Court.

8.0 Roles and responsibilities

8.1 Differentiating between inspection and investigation

One of the most important distinctions in compliance and enforcement is the difference between "inspection" and "investigation", which must be treated as different and independent activities.

a) Inspection

Inspections are conducted by inspectors and veterinary inspectors with the predominant purpose of verifying compliance with legislation enforced by CFIA. When conducting inspections, inspectors and veterinary inspectors, who are designated under the *Canadian Food Inspection Agency Act*, exercise the authorities conferred on them by the relevant legislation to determine whether regulated parties and their products are in compliance with that legislation. If the information obtained indicates that there is non-compliance, enforcement action may be undertaken or the matter may be referred for further evaluation and/or investigation.

b) Investigation

For the purpose of this policy, an investigation is where the main purpose of an inquiry by a CFIA official is for the determination of penal liability. Investigations are carried out by Investigation Specialists whose predominant purpose is to gather and secure evidence.

8.2 Regulated parties

Regulated parties are responsible for ensuring safety and compliance of their activities, processes and products. Therefore, regulated parties need to become familiar and comply with legislative requirements. Regulated parties are also responsible for their actions and are required by legislation to provide reasonable assistance to CFIA inspection personnel to enable them to carry out their duties and functions. Failure to do so may result in enforcement action due to obstruction of an inspector acting in the course of their duties, or due to the provision of false or misleading information to them.

8.3 CFIA enforcement officials

CFIA enforcement officials include inspectors and veterinary inspectors, investigators and investigation specialists, as well as officials of other agencies or departments who are designated to enforce CFIA legislation.

a) Inspectors and veterinary inspectors

Inspectors and veterinary inspectors are individuals who have been designated to enforce legislation for which CFIA is responsible. Examples of duties undertaken by inspectors and veterinary inspectors include:

- communicating with regulated parties regarding the legislative requirements, how compliance will be assessed and what is considered non-compliance;
- carrying out inspections to verify, assess and monitor compliance; and to prevent non-compliance as per the authorities granted to them under the legislation enforced by CFIA (e.g., to compel a regulated party to provide information; enter and inspect places, premises and conveyances; open containers and packages; conduct tests; restrict the movement of a thing or order it be moved or not moved; seize and detain products.)
- documenting inspection findings (e.g., taking photographs and/or videos);
- informing regulated parties of identified non-compliance, and following up to verify that appropriate corrective actions have been implemented;
- preparing non-compliance reports;
- responding to consumer complaints;
- preparing administrative monetary penalty files and issuing Notices of Violation (NOVs) (where designated); and
- giving evidence in court and at reviews before the CART.

b) Investigators and investigation specialists

CFIA investigators and investigation specialists generally conduct investigations for the purpose of gathering evidence that may lead to more serious enforcement actions, up to and including prosecution. They have expertise in investigation procedures and techniques, including:

- obtaining and executing search warrants and production orders;
- gathering and protecting the continuity of evidence;
- interviewing and obtaining statements from persons who may have relevant information such as potential witnesses or accused persons;
- conducting surveillance; and
- following the rules for admissibility of evidence.

CFIA investigators and investigation specialists respect requirements outlined in the *Canadian Charter of Rights and Freedoms*, the *Canada Evidence Act*, the *Criminal Code of Canada* and other relevant federal legislation when conducting their duties. Moreover, they generally:

- provide enforcement-related advice, guidance and assistance to inspection staff and management;
- conduct investigations;
- review and prepare briefs of evidence recommending prosecution;
- prepare court documents in the form of information or court orders, draft agreed statements of fact, and oversee court ordered disposals;
- prepare Administrative Monetary Penalty (AMP) files and issue NOVs, where required;
- give evidence in court;
- liaise with Agriculture and Food Inspection Legal Services and the Public Prosecution Service of Canada (PPSC) with respect to investigations and prosecutions;

- deliver enforcement training to CFIA staff; and
- assist legal counsel representing CFIA before the CART in relation to AMPs reviews and before the Courts during prosecution-related matters.

c) CFIA management executives

Classes of CFIA management executives have been delegated ministerial and presidential authorities to:

- undertake actions on permissions (e.g. licences and registrations), such as suspension, cancellation or revocation; and
- approve recommendations that non-compliances be referred to PPSC for possible prosecution.

8.4 Other CFIA officials

a) CFIA analysts

- conduct chemical, microbiological, pathological, and physical analytical services, including research, related to foods, animals, feeds, fertilizers and plants/seeds; and
- perform diagnostic tests, technology development and transfer, laboratory accreditation, scientific advice and analytical capability for animal diseases and plant pests.

b) CFIA graders

- assess the quality attributes and standards of products regulated by the Agency.

c) Other CFIA officials

- develop compliance promotion strategies to increase understanding of regulatory requirements, address recurring non-compliance issues, and provide timely notification to the public;
- identify areas of frequent non-compliance that require more oversight or a review of policy and programs;
- collect data on industry compliance and non-compliance rates;
- develop interpretative guidance for industry and stakeholders, and operational guidance for CFIA staff;
- serve as subject matter experts and witnesses in court or tribunal proceedings; and
- report on whether compliance-related efforts are improving industry compliance.

More information about roles and responsibilities can be found on the CFIA website.

8.5 Other agencies

Under certain circumstances the CFIA collaborates with other departments and agencies to enforce its legislation. One example is the Canada Border Services Agency (CBSA), which is responsible under the *Canada Border Services Agency Act* for the enforcement of the CFIA's food, animal and plant-related legislation at airports and other Canadian border points, other than import service centres.

8.6 Public Prosecution Service of Canada

The Public Prosecution Service of Canada (PPSC) is responsible for all prosecutions arising out of violations of the Acts administered and enforced by CFIA.

PPSC provides advice to law enforcement agencies such as CFIA, as well as advice and assistance to investigators at the investigative stage. They work closely with various law enforcement agencies and take their input into account when considering if prosecution is warranted.

9.0 Reference documents

For more information about compliance and enforcement, please visit CFIA's website. Examples of reference documents include:

- CFIA Compliance Continuum;
- CFIA's Statement of Values;

- Statement of Rights and Service for Producers, Consumers and Other Stakeholders;
- CFIA Acts and regulations; and
- Open and Transparent Agency Policy

Guidance documents on compliance and enforcement are also available on the Agency's website, including:

- Standard Permissions Procedure (SPP);
- Standard Inspection Procedure (SIP); and
- Standard Regulatory Response Process (SRRP).

10.0 Monitoring and reporting

The Compliance and Enforcement Policy will be reviewed to evaluate its implementation and success in achieving its stated objectives (refer to section 3) to confirm its continued applicability. The review will occur at least once every five years. Results of reviews will be reported to the Business, Innovation, Policy and Planning Committee (BIPPC) and Senior Management Committee (SMC).

Updates and revisions will be made to reflect significant changes to CFIA's legislation or organizational structure or as deemed necessary due to the review outcomes.

11.0 Inquiries

For questions related to Compliance Promotion, please contact:

Executive Director
Engagement, Corporate & e-Communications Directorate
Communications and Public Affairs Branch
cfia.sfcroutreach-sensibilisationrsac.acia@canada.ca

For questions related to Compliance Verification and Regulatory Response, please use the "Contact Us" form found on the CFIA website.

For guidance and clarification on specific enforcement matters, please contact your local CFIA office.

For questions regarding the Compliance and Enforcement Policy, please contact:

Director
Program Policy Integration Division
Policy and Regulatory Affairs Directorate
Policy and Programs Branch
cfia.programpolicy-politiqueprogramme.acia@canada.ca

12.0 Effective date

This policy comes into effect on November 1st, 2020.

Approval

The Compliance and Enforcement Policy has been approved by the President.

Siddika Mithani — Signature

September 18, 2020 — Date

Appendix A – CFIA's compliance and enforcement continuum

1.0 CFIA's compliance and enforcement continuum

CFIA's Compliance and Enforcement Policy is based on the concept of a continuum, which includes: compliance promotion, monitoring and assessment (compliance verification), response to risk and non-compliance (regulatory response), and provision to regulated parties of information with respect to recourse and feedback mechanisms as illustrated in Figure 1.

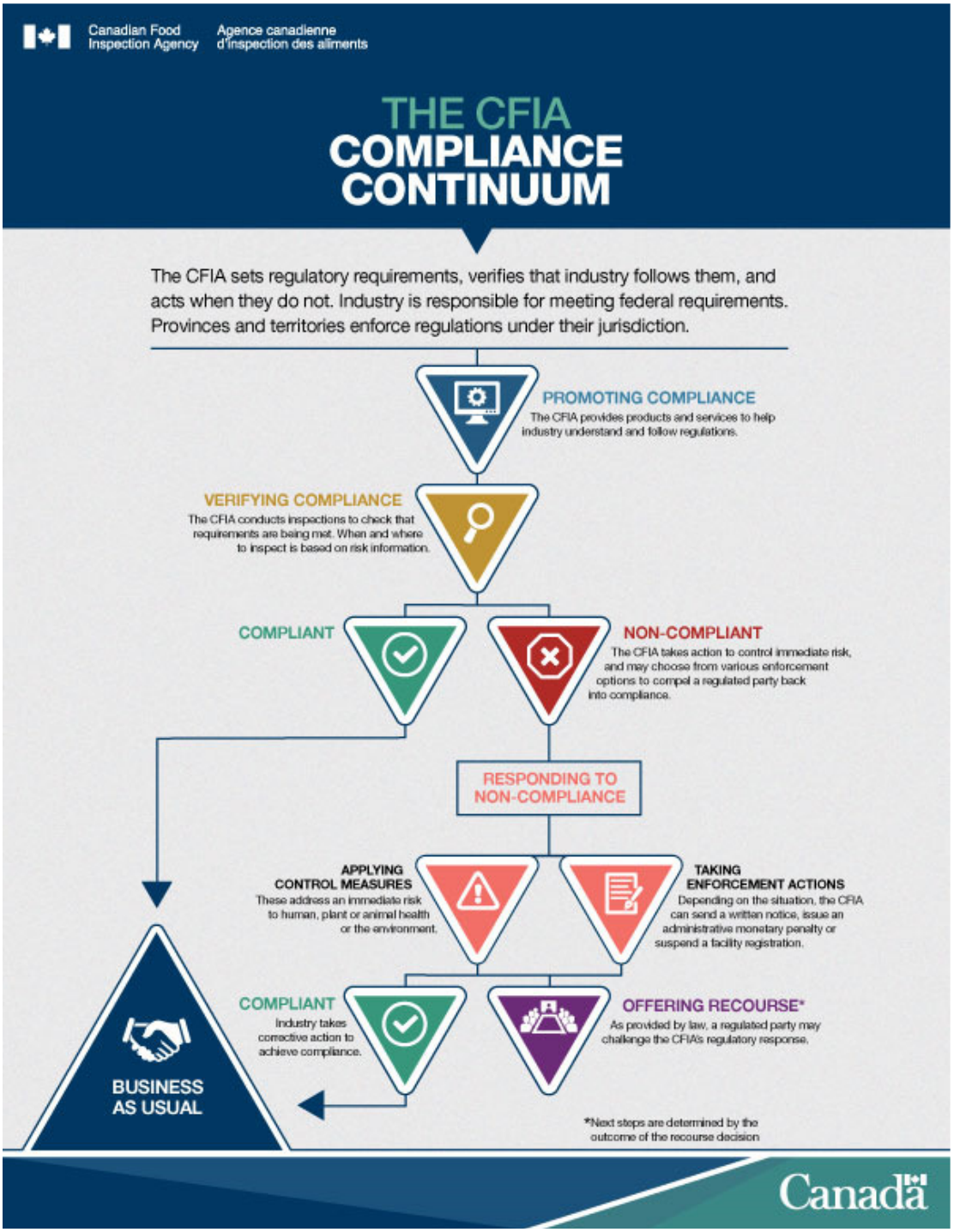

Figure 1: CFIA compliance continuum

Examples of actions and tools for each continuum category are listed in table 1 below.

Table 1: Compliance promotion, compliance verification, regulatory response, and recourse activities of the compliance and enforcement continuum

Continuum category	Actions and tools		
Compliance promotion	**Technical support:** • Clearly outlined compliance requirements • Well-established, effective practices or procedures that the regulated party may use to meet a required outcome • Guidance documents for stakeholders • On-line tools (e.g., Industry Labelling Tool, Automated Import Reference System (AIRS)) • AskCFIA (for food-related regulatory questions) **Communication:** • Information material (e.g., videos, infographics, fact sheets, industry notices, etc.) • Information sessions, webinars, etc. • Consultations with regulated parties • CFIA website and social media (Facebook, Twitter, LinkedIn) **Other incentives:** • MyCFIA - electronic access to request and receive services (permits, certificates, licences) • Statement of rights		
Compliance verification	• Inspections • Verifications • Monitoring • Grading	• Analyses • Sampling • Feedback	
Regulatory response	Control actions	• Seize and detain • Start or stop an activity • Forfeiture • Confiscation • Quarantine • Refuse entry • Order removal from Canada • Injunction	• Restrict or prohibit movement • Recall • Dispose or destroy • Refuse to issue certificate • Add conditions to a permission* • Treatment
	Administrative actions	• Letter/Notice of Non-Compliance	• Meeting with the regulated party
	Enforcement actions	• Administrative Monetary Penalties (AMPS)	• Actions taken against permissions • Recommend prosecution
Recourse and feedback mechanisms	• Re-inspection • Complaints • Appeals • Judicial review		

*Permission includes licence, registration, permit, and certification.

Note: This table represents some of the responses available to CFIA. The Agency will select the most appropriate response to address risk and/or non-compliance.

1.1 Compliance promotion

CFIA believes that compliance promotion is an effective tool for generating compliance. Compliance promotion is facilitated when CFIA is transparent in its approach to compliance and has clearly articulated legislative requirements as well as accessible information tools and services for regulated parties. Although not a formal compliance promotion activity, CFIA also encourages compliance by responding effectively and efficiently to non-compliance.

a) Transparency

Compliance promotion begins with open, two-way dialogue and exchange with all stakeholders. CFIA strives for a coordinated, transparent approach to compliance that is accountable to Canadians, and recognizes that an effective way to obtain compliance is to involve regulated parties during the early stages of legislative change and policy development. When CFIA is developing program-specific policies and programs, consultations with all stakeholders, including the public, are undertaken.

b) Clear and enforceable requirements

CFIA strives to develop regulatory requirements that are clear and enforceable. Clearly worded legislation supports compliance by making it easier for regulated parties to understand the requirements they must meet.

c) Information tools and services

Regulated parties have an obligation to be familiar with the requirements of the law. In order to facilitate this, regulated parties are provided with information on new or existing initiatives, legislation, policies or procedures. A vital delivery vehicle for compliance promotion products at CFIA is its website. Plain language information tools, products, services and guidance are distributed as part of the overall communications package to assist regulated parties in understanding legislative requirements. CFIA uses a number of different tools, including consultations, publication of information, outreach and awareness campaigns and other initiatives to inform regulated parties of the legislative requirements that must be met. Examples of information that CFIA may provide include links to current legislation, information and tools regarding established practices or procedures, fact sheets, videos and infographics. Regulated parties can also ask questions to CFIA using established channels (e.g., contact My CFIA online) to help them understand and comply with legislative requirements.

1.2 Compliance verification

CFIA conducts a range of inspection activities to assess whether a regulated party is meeting its regulatory requirements. These may include:

- visually inspecting food commodities, feeds, plants, animals, or other regulated things;
- reviewing company records and preventive control plans;
- interviewing company personnel;
- observing facility/establishment processes;
- sampling and testing products and food contact surfaces; and
- assessing the quality attributes and standards of products.

CFIA determines areas of highest risk based on a number of factors, including:

- scientific analysis of potential hazards that can occur at particular points in production;
- previously identified risks associated with specific products;
- a company's compliance history;
- random sampling and testing; and
- risk assessment models (e.g., Establishment-Based Risk Assessment (ERA)).

a) CFIA-led compliance activities

Inspection personnel perform compliance verification activities on a variety of things or places for which legislative requirements exist, including:

- regulated products;
- establishments/facilities/premises/vehicles/ships;
- operations within establishments;
- operators;
- containers and packages;
- labels and markings; and
- systems, records, and documents.

Established program-specific policies and procedural documents based on legislative requirements guide inspection personnel on how to conduct inspection activities and the frequency of such activities. They describe detailed actions respecting the thing or place to be assessed, the assessment criteria and what constitutes compliance. The thing or place may be assessed according to legislation, standards, guidelines, policies, codes of practice, etc.

Inspection results are recorded and communicated to the regulated party with an inspection report and/or Corrective Action Request (CAR), and become part of the regulated party's inspection compliance history.

b) Regulated party-led compliance activities

Regulated parties may undertake a number of initiatives to assist in achieving compliance with applicable legislative requirements. This may include operating a voluntary compliance system - such as the On-Farm and Post-Farm Food Safety Programs or a voluntary certification program like the Chronic Wasting Disease (CWD) Voluntary Herd Certification Program. These compliance systems permit industry to self-assess and correct deficiencies as they arise.

1.3 Regulatory response

Designated CFIA inspectors and veterinary inspectors routinely take actions to respond to risk (control action) and/or non-compliance (enforcement action). The objectives of these actions are to:

- safeguard food, animals and plants that enhance the health and well-being of Canada's people;
- change the behaviour of the non-compliant regulated party;
- eliminate financial benefit to the regulated party from non-compliance;
- be responsive and consider what is appropriate for the particular non-compliant regulated party; and
- deter future non-compliance in general.

There is a broad range of control and enforcement tools available to CFIA that can be undertaken by designated inspectors, veterinary inspectors, or CFIA's employees who have been delegated by the Minister any power, duty or function conferred upon them under the different Acts enforced or administered by CFIA.

CFIA Standard Regulatory Response Process (SRRP) provides guidance for CFIA staff and is used to determine the appropriate control measures and enforcement responses to use when responding to risk and/or non-compliance. One or more of the control or enforcement actions outlined in this section may be taken in response to risk or non-compliance. *It should be noted that the actions listed below may not apply to all CFIA inspection programs.*

a) Control actions

Where a risk is or may be posed to human, plant or animal health, the economy, the environment, or trade, the inspector takes action to control or mitigate the risk by implementing a control response plan. The purpose of a control response plan is to determine the nature and extent of a hazard and inform risk assessment and risk mitigation. The Standard Regulatory Response Process (SRRP) defines the control process.

Hazards may originate from a process, commodity, thing or action by a regulated party that may or may not involve non-compliance with legislative requirements. Risk may also be the result of other triggers including but not limited to a natural disaster or disease outbreak.

Control actions may be triggered by information from a variety of sources, including:

- consumers/members of the public;
- regulated parties;
- CFIA inspection findings;
- laboratory results;
- private veterinarians; and
- domestic or foreign governments.

A control response plan may include one or more of the following control actions:

Note: As each of the following actions may not apply to every inspection program, it is important to refer to the legislation governing the applicable product, process or thing to confirm that the required regulatory authorities are in place.

i) Seizure and detention

Seizure and detention allow CFIA to maintain control of a regulated product or thing. Seizure and detention can be maintained until:

- the product is brought into compliance;
- the court or administrative monetary penalty proceedings have been concluded; or
- the statutory time limitation expires.

The legislation provides authority to seize and detain product or other things by means of or in relation to which the inspector believes on reasonable grounds that a contravention was committed (such as a carcass, an object being used to harm an animal, tampered ear tags, fake certificates or stamps, etc.).

ii) Start or stop an activity

This allows for the start or stop of an activity when an inspector is verifying compliance or preventing non-compliance in a place where an activity regulated under the *Safe Food for Canadians Act* is taking place or a regulated commodity is believed to be present.

iii) Forfeiture

Forfeiture refers to regulated products or things that become the property of Her Majesty in Right of Canada. They can be:

- ordered forfeited by the CART when an AMP is upheld or by the Courts as part of a judgment;
- voluntarily forfeited by a regulated party; or
- forfeited as provided for in legislation in specific situations.

For forfeiture ordered by the CART or the Courts, forfeited products or things are disposed of as directed. In these cases, the role of the inspector is to execute this order. Disposal of forfeited products or things is generally at the expense of the person from whom the product was seized and is legislation dependent.

iv) Confiscation

Under the *Plant Protection Act*, an inspector has the authority to confiscate, or take possession of, a plant or thing when the inspector has reasonable grounds to believe the thing is a pest, is or could be infested with a pest or constitutes or could constitute a biological obstacle to the control of a pest.

v) Quarantine

Quarantine is an action taken to prevent the introduction or spread of a disease or pest in Canada by isolating an infected animal, plant or thing. This authority is found under the *Health of Animals Act* and the *Plant Protection Act*. In such circumstances, an inspector will issue a quarantine notice in order to prevent the spread of the disease or pest. The quarantine notice sets out the length of time and conditions during the quarantine period.

vi) Refuse entry

Under the *Plant Protection Regulations*, plants or things that pose a risk to the health and safety of Canada's plant resource base may be refused entry into Canada. This may be appropriate when a plant or thing:

- originates from a country known to be infected with transmittable plant pests;
- poses a risk of transmitting or spreading the pest to susceptible plant species in Canada; or
- has not been imported in compliance with appropriate legislative requirements.

vii) Order removal from Canada

Where an inspector has reasonable grounds to believe an imported product does not meet Canadian requirements or is imported illegally, the inspector may order the product removed from Canada.

viii) Restrict or prohibit movement

The movement of regulated products and things may be restricted or prohibited into and out of an infested/infected area for a period of time for the purpose of controlling the regulated animal or thing and verifying that it meets legislative requirements.

ix) Recall

Recalling a product is appropriate when there are reasonable grounds to believe the regulated product poses a risk to public, animal or plant health. Where the regulated party is unwilling or unable or refuses to initiate a voluntary recall of the product, a recall order may be issued pursuant to section 19 of the Canadian Food Inspection Agency Act. In these cases, the Minister may issue a notice to the regulated party selling, marketing or distributing the product requiring the regulated party to recall the product.

x) Dispose or destroy

The disposal or destruction of a regulated animal, product or thing that has been seized, forfeited or confiscated may be ordered where the regulated product:

- poses a risk to human, plant or animal health or the environment;
- is affected or suspected of being affected by a disease or toxic substance;
- constitutes or could constitute a biological obstacle to the control of a pest or disease;
- has been in contact or close proximity with an animal affected or suspected of being affected by a disease or toxic substance; or
- is, or is suspected of being, a vector, a causative agent of a disease or a toxic substance.

Some Acts administered by CFIA (e.g., *Plant Protection Act*) permit the Agency to order the disposal or destruction of regulated products or things. Under other legislation these actions may only

occur with the consent of the regulated party or person in possession, care or control of the product at the time of its seizure.

xi) Refuse to issue inspection certificate

Refusal to certify regulated products may be appropriate when the regulated product fails to meet the requirements of the importing country, or when an inspector is unable to assess whether or not the regulated product meets the required legislative requirements. An inspector may refuse to issue inspection certificates where it has been determined that the regulated product does not meet the applicable legislative requirements.

xii) Add conditions to permissions

CFIA grants permissions authorizing regulated parties to conduct specific activities to meet regulatory requirements, including registration and licence. The Minister may make any registration or licence subject to certain conditions that the Minister feels are appropriate as described in the related Acts and regulations. The holder of the registration or licence must comply with all the conditions. Failure to do so may result in the non-issuance, suspension or cancellation of permissions.

xiii) Injunction

On application by the Minister, the court may order a person to stop doing an activity that may be in violation of the *Safe Food for Canadians Act,* or start an activity to prevent the commission of an offence under this Act. Under section 18 of the *Canadian Food Inspection Agency Act*, CFIA may apply to a court of competent jurisdiction for an interim injunction enjoining a person from contravening legislation that the Agency enforces or administers.

b) Administrative actions

When they are deemed by CFIA to be the most effective and appropriate responses to non-compliance, the Agency can use administrative responses to non-compliance to assist a regulated party to achieve compliance, such as issuing letters of non-compliance or conducting meetings with regulated parties. These responses are not provided for in legislation enforced by CFIA but are set out in policy developed by the Agency.

i) Letter of non-compliance

A Letter of non-compliance is a procedural administrative action (i.e., not enabled by legislation enforced by CFIA) that may be delivered to a regulated party when:

- the non-compliance has not resulted, or is not likely to result, in serious or very serious harm (such as health or safety risks to humans, plants, or animals; or marketplace deception);
- the non-compliance is unintentional and easily corrected; and
- the inspector believes that a Letter of Non-Compliance will have the appropriate deterrent effect.

ii) Meeting with the regulated party

A meeting with the regulated party is a procedural administrative action, which provides the regulated party with an opportunity to meet face to face with the CFIA to discuss significant or ongoing issues of non-compliance. CFIA management (or delegate) may initiate and convene a meeting with the regulated party when:

- there is a concern that the regulated party is not committed to addressing non-compliance issues or meeting regulatory responsibilities;
- the same type of non-compliance occurs repeatedly; or
- previous actions (e.g., letter of non-compliance) have not been effective.

If the meeting does not improve the commitment or ability of the regulated party to comply with requirements, other response options in the compliance and enforcement continuum will be pursued.

c) Enforcement actions

Once non-compliance has been determined, CFIA responds appropriately:

- as per the Standard Inspection Procedure (SIP), the non-compliance is recorded in an inspection report and communicated to the regulated party. Time frames are established for return to compliance which is confirmed by the inspector during a follow up inspection.
- where the regulated party is unwilling or unable to return to compliance or where the nature of the original non-compliance requires an enforcement response, a variety of enforcement actions can be undertaken.

The inspector has the flexibility to select the appropriate action based on the gravity of the non-compliance which is determined by considering the potential or actual harm, the compliance history of the regulated party and the intent associated with the non-compliance.

As the gravity of a non-compliance event increases, more stringent enforcement responses may be considered and may involve CFIA investigators and investigation specialists.

- **harm** - takes into consideration the seriousness of harm or potential harm of the non-compliance, such as the potential impact on human health, the animal or plant resource base or the environment, marketplace deception or product misrepresentation.
- **history** - the compliance history of the regulated party is considered with respect to the existence of previous instances of non-compliance and the seriousness of past non-compliance.
- **intent** - CFIA considers the intent of the regulated party to commit a contravention or cause harm, such as evidence that demonstrates the regulated party knowingly contravened the legislative requirements.

Once it is determined that an enforcement response is required, one or more of the following actions may be considered.

Note: some of the options listed below are not supported in the legislation governing each business line. Some business lines may also have additional administrative options – refer to the applicable acts, regulations and enforcement guidelines.

i) Administrative Monetary Penalties (AMPs), where applicable

The *Agriculture and Agri-Food Administrative Monetary Penalties Act (AAAMP Act*) and *Regulations* (*AAAMP Regulations*) provide for the issuance of two types of Notices of Violation to regulated parties: a "Notice of Violation with Warning" or a "Notice of Violation with Penalty". Notices of Violation (NOV) may be issued for violations of the relevant Acts or regulations as set out in Schedule 1 of the *AAAMP Regulations*.

Classification levels of AMPs violations (i.e. minor, serious and very serious) are assigned based on the level of risk and severity of consequences and are set out in Schedule 1 of the *AAAMP Regulations*, which informs the base penalty amount for violations.

AMPs may be issued to any regulated party, company or individual that commits a violation as per the Agency's legislation (e.g., regulated parties engaged in commercial activities that do not comply with regulatory requirements, individual travellers who import prohibited goods). To maintain their effectiveness, AMPs are issued on a discretionary and risk-informed basis. When determining whether to issue a NOV with warning or with penalty, consideration is given by CFIA to the proportionality of the warning or penalty amount to the contravention and its likelihood to encourage compliance. AMPs are generally less punitive and costly sanctions compared to

prosecution or licence suspension or cancellation. In addition, if the penalty is $2,000 or more, a regulated party may request to enter into a compliance agreement. In this case, the amount of the penalty will be reduced by one dollar for every two dollars spent by regulated party, with a maximum reduction to nil, in improvements made to bring the regulated party back into compliance.

AMPs apply to the *Health of Animals Act*, *Plant Protection Act*, *Safe Food for Canadians Act* and their respective regulations.

ii) Actions taken against permissions

The suspension, cancellation, or revocation of permissions (e.g., licence, registration, permit, or certificates) is generally appropriate when the regulated party is unwilling or unable to comply with legislative requirements. It should be noted that the requirements for taking actions against permissions vary according to the various pieces of legislation.

Note: actions can be taken against permissions in conjunction with other enforcement actions, including the issuance of an AMP or the initiation of a prosecution.

iii) Recommendation to prosecute

The PPSC has the responsibility for all prosecutions relating to legislation administered and/or enforced by CFIA. Where prosecution is deemed the most appropriate response by CFIA and having received authorization by the Area Director General, Area EIS will forward briefs of evidence to the appropriate office of the PPSC with the recommendation that charges be laid. It is clearly recognized that the discretion to initiate a prosecution rests with PPSC.

Prosecution is used for instances of non-compliance and involves CFIA investigators and investigation specialists. For example:

- all other enforcement tools have failed to bring the regulated party back into compliance;
- the seriousness of harm or potential harm of the non-compliance event is very high (e.g., death of a person, serious harm or risk to the environment, marketplace deception); or
- the evidence demonstrates the regulated party intended to contravene the legislative requirements.

1.4 Recourse and feedback mechanisms

The CFIA recognizes that regulatory decisions and enforcement actions may have an impact on regulated parties. There are a variety of recourse mechanisms available to regulated parties which are based on legislative provisions, as well as on common and civil law and CFIA policy.

Parties who are regulated by the CFIA may wish to consider recourse avenues should they disagree or be dissatisfied with the action taken by the CFIA. In some cases, legislation that is administered and enforced by the CFIA permits specific avenues of recourse related to the regulatory action(s) taken by the CFIA. Regulated parties should review the applicable legislation and CFIA policies to determine what rights to recourse may be available to them in respect of regulatory actions and service delivery.

For more information on available recourse, please visit Complaints and Appeals Office.

Appendix B - Definitions

Administrative Monetary Penalty (AMP) is served on a regulated party in the form of a Notice of Violation with warning or with penalty. AMPs with financial penalty to individuals can range from $500 to $1,300. Violations committed in the course of business or in order to obtain a financial benefit can result in financial penalties ranging from $1,300 for minor violations to $15,000 for very serious violations.

Compliance is the state of conformity of regulated parties with legislative requirements.

Compliance promotion is any activity that supports, motivates or encourages compliance with legislation that CFIA enforces. This includes accessible plain-language tools, products, services and guidance to increase awareness and understanding of regulations, that help regulated parties implement regulatory requirements.

Contravention refers to non-compliance with the requirements of CFIA's legislation.

Control action is an action that is taken for the purpose of controlling risk when a regulated commodity, process or thing poses or may pose a risk to human, plant or animal health, the environment, economy or trade.

Enforcement action is an action taken by CFIA in response to non-compliance.

Enforcement officials at CFIA include inspectors, veterinary inspectors and officials of other agencies or departments who are designated to enforce CFIA legislation. It also includes EIS investigators and investigation specialists who are designated inspectors with the responsibility for conducting investigations for the purpose of enforcing CFIA's legislation.

Hazard a potential source of harm, and can be biological, chemical or physical.

Information tool is used in reference to any form of industry communication, including, but not limited to: model systems, interpretive guidance, letters, pamphlets, brochures, communiqués, guidelines, presentations and Listserv messages.

Inspector is an individual who has been designated under the *CFIA Act* to enforce CFIA legislation.

Inspection report is the primary mechanism by which CFIA communicates non-compliance to the regulated party.

Legislation can refer to an Act or its regulations.

Non-compliance is a contravention of the applicable Acts and/or Regulations.

Permission is an official consent granting legal authorization to a regulated party to conduct specified activities (permits, certificates, licences, authorizations, and registrations).

Regulated party refers to an individual or business entity undertaking activities that are regulated by CFIA legislation.

Regulated product/thing for which legislation is enforced by CFIA applies.

Regulatory response is an action taken in response to non-compliance or risk.

Risk is the product of the likelihood of the occurrence of a hazard, and the severity of its consequences.

Violation is any contravention of an Agri-Food Act or its regulations that may be proceeded with in accordance with the *Agriculture and Agri-Food Administrative Monetary Penalties Act* and result in the issuance of a Notice of Violation with warning or penalty.

Appendix C - Acronyms

AMP - Administrative Monetary Penalty

AAAMPs Act - *Agriculture and Agri-Food Administrative Monetary Penalties Act*

CART - Canadian Agricultural Review Tribunal

CBSA - Canada Border Services Agency

CFIA - Canadian Food Inspection Agency

EIS - Enforcement and Investigation Services

NOV – Notice of Violation

PPSC - Public Prosecution Service of Canada

SIP - Standard Inspection Procedure

SRRP - Standard Regulatory Response Procedure

SPP - Standard Permissions Procedure

Gilles Doré *Appellant*

v.

Pierre Bernard, in his capacity as Assistant Syndic of the Barreau du Québec, Tribunal des professions and Attorney General of Quebec *Respondents*

and

Federation of Law Societies of Canada, Canadian Civil Liberties Association and Young Bar Association of Montreal *Interveners*

Indexed as: Doré *v.* Barreau du Québec

2012 SCC 12

File No.: 33594.

2011: January 26; 2012: March 22.

Present: McLachlin C.J. and Binnie, LeBel, Fish, Abella, Rothstein and Cromwell JJ.

ON APPEAL FROM THE COURT OF APPEAL FOR QUEBEC

Administrative law — Judicial review — Standard of review — Disciplinary council — Lawyer challenging constitutionality of council's decision — Proper approach to judicial review of discretionary administrative decisions engaging Charter protections — Whether framework developed in R. v. Oakes appropriate to determine if discretionary administrative decisions comply with Canadian Charter of Rights and Freedoms.

Law of professions — Discipline — Barristers and solicitors — Lawyer writing private letter to judge and criticizing him — Disciplinary council finding lawyer in breach of duty to behave with objectivity, moderation and dignity and reprimanding him — Whether council properly balanced relevant Charter values with statutory objectives — Whether decision reasonable — Code of ethics of advocates, R.R.Q. 1981, c. B-1, r. 1, art. 2.03.

Gilles Doré *Appelant*

c.

Pierre Bernard, ès qualités de syndic adjoint du Barreau du Québec, Tribunal des professions et procureur général du Québec *Intimés*

et

Fédération des ordres professionnels de juristes du Canada, Association canadienne des libertés civiles et Association du Jeune Barreau de Montréal *Intervenantes*

Répertorié : Doré *c.* Barreau du Québec

2012 CSC 12

N^{o} du greffe : 33594.

2011 : 26 janvier; 2012 : 22 mars.

Présents : La juge en chef McLachlin et les juges Binnie, LeBel, Fish, Abella, Rothstein et Cromwell.

EN APPEL DE LA COUR D'APPEL DU QUÉBEC

Droit administratif — Contrôle judiciaire — Norme de contrôle — Comité de discipline — Contestation par un avocat de la constitutionnalité de la décision du Comité — Approche correcte du contrôle judiciaire des décisions administratives de nature discrétionnaire mettant en cause les protections conférées par la Charte — Le cadre d'analyse élaboré dans R. c. Oakes convient-il pour apprécier la conformité à la Charte canadienne des droits et libertés de décisions administratives de nature discrétionnaire?

Droit des professions — Discipline — Avocats et procureurs — Lettre privée adressée par un avocat à un juge dans laquelle il critique ce dernier — Décision du Comité de discipline de réprimander l'avocat pour avoir manqué à son obligation de faire preuve d'objectivité, de modération et de dignité — Le Comité a-t-il correctement mis en balance les valeurs pertinentes consacrées par la Charte et les objectifs visés par la loi? — La décision était-elle raisonnable? — Code de déontologie des avocats, R.R.Q. 1981, ch. B-1, r. 1, art. 2.03.

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D appeared before a judge of the Superior Court of Quebec on behalf of a client. In the course of D's argument, the judge criticized D. In his written reasons rejecting D's application, the judge levied further criticism, accusing D of using bombastic rhetoric and hyperbole, of engaging in idle quibbling, of being impudent and of doing nothing to help his client discharge his burden. D then wrote a private letter to the judge calling him loathsome, arrogant and fundamentally unjust, and accusing him of hiding behind his status like a coward, of having a chronic inability to master any social skills, of being pedantic, aggressive and petty, and of having a propensity to use his court to launch ugly, vulgar and mean personal attacks.

The Assistant Syndic of the Barreau du Québec filed a complaint against D based on that letter alleging that D had violated art. 2.03 of the *Code of ethics of advocates*, which states that the conduct of advocates "must bear the stamp of objectivity, moderation and dignity". The Disciplinary Council of the Barreau du Québec found that the letter was likely to offend, rude and insulting, that the statements had little expressive value, and that the judge's conduct, which resulted in a reprimand from the Canadian Judicial Council, could not be relied on as justification for it. The Council rejected D's argument that art. 2.03 violated s. 2(*b*) of the *Canadian Charter of Rights and Freedoms*, finding that the limitation on freedom of expression was reasonable. Based on the seriousness of D's conduct, the Council reprimanded D and suspended his ability to practice law for 21 days. On appeal to the Tribunal des professions, D abandoned his constitutional challenge to the specific provision, arguing instead that the sanction itself violated his freedom of expression. The Tribunal found that D had exceeded the objectivity, moderation and dignity expected of him and that the decision to sanction D was a minimal restriction on his freedom of expression. On judicial review, the Superior Court of Quebec upheld the decision of the Tribunal.

Before the Quebec Court of Appeal, D no longer appealed the actual sanction of 21 days, challenging only the decision to reprimand him as a violation of the *Charter*. The Court of Appeal applied a full *Oakes* analysis under s. 1 of the *Charter* and upheld the

D a comparu devant un juge de la Cour supérieure du Québec pour le compte de son client. Au cours de la plaidoirie de D, le juge a formulé des critiques à l'égard de ce dernier. Dans les motifs écrits par lesquels il a rejeté la requête présentée par D, le juge a formulé d'autres critiques à l'égard de D, l'accusant de faire de la rhétorique ronflante et de l'hyperbole, de se perdre en arguties sans fondement, de faire preuve d'outrecuidance et de n'avoir rien fait pour assister son client à se décharger de son fardeau. D a adressé une lettre privée au juge, dans laquelle il le décrit comme un être exécrable, arrogant et foncièrement injuste et l'accuse de se cacher lâchement derrière son statut, d'être chroniquement incapable de maîtriser quelque aptitude sociale, d'adopter un comportement pédant, hargneux et mesquin et de démontrer une propension à se servir de sa tribune pour s'adonner à des attaques personnelles mesquines, repoussantes et vulgaires.

Le syndic adjoint du Barreau du Québec a formulé une plainte contre D fondée sur cette lettre. Selon la plainte, D avait contrevenu à l'art. 2.03 du *Code de déontologie des avocats*, qui énonce que la conduite de l'avocat « doit être empreinte d'objectivité, de modération et de dignité ». Le Comité de discipline du Barreau du Québec a conclu que la lettre de D était de nature à choquer et constituait des propos grossiers et injurieux, que les propos de l'avocat n'avaient que peu de valeur sur le plan expressif et que D ne pouvait invoquer la conduite du juge — qui avait écopé pour sa part d'une réprimande du Conseil canadien de la magistrature — pour justifier la lettre. Le Comité de discipline a rejeté l'argument de D selon lequel l'art. 2.03 violerait l'al. 2*b*) de la *Charte canadienne des droits et libertés*, concluant que la restriction à la liberté d'expression était raisonnable. Estimant que le manquement de D à son obligation était grave, le Comité de discipline a réprimandé ce dernier et a suspendu son droit de pratique durant 21 jours. Dans l'appel interjeté devant le Tribunal des professions, D a abandonné la contestation constitutionnelle de la disposition pertinente, faisant plutôt valoir que sa liberté d'expression était brimée par la réprimande elle-même. Le Tribunal était d'avis que D n'avait pas fait preuve de l'objectivité, de la modération et de la dignité qu'on attendait de lui et que la décision de lui infliger une sanction constituait une restriction minimale à la liberté d'expression de D. À l'issue d'une révision judiciaire, la Cour supérieure du Québec a maintenu la décision du Tribunal.

Devant la Cour d'appel du Québec, D appelait, non plus de la suspension de son droit de pratique durant 21 jours, mais de la décision de le réprimander, qu'il considérait comme une violation de la *Charte*. Au terme d'une analyse complète fondée sur l'article premier de

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reprimand. It found that D's letter had limited importance compared to the values underlying freedom of expression, that the Council's decision had a rational connection to the important objective of protecting the public and that the effects of the decision were proportionate to its objectives.

Held: The appeal from the result should be dismissed.

To determine whether administrative decision-makers have exercised their statutory discretion in accordance with *Charter* protections, the review should be in accordance with an administrative law approach, not a s. 1 *Oakes* analysis. The standard of review is reasonableness.

In assessing whether a law violates the *Charter*, we are balancing the government's pressing and substantial objectives against the extent to which they interfere with the *Charter* right at issue. If the law interferes with the right no more than is reasonably necessary to achieve the objectives, it will be found to be proportionate, and, therefore, a reasonable limit under s. 1. But in assessing whether an adjudicated decision violates the *Charter*, we are engaged in balancing somewhat different but related considerations, namely, has the decision-maker disproportionately, and therefore unreasonably, limited a *Charter* right. In both cases, we are looking for whether there is an appropriate balance between rights and objectives, and the purpose of both exercises is to ensure that the rights at issue are not unreasonably limited.

There is nothing in the administrative law approach which is inherently inconsistent with the strong protection of the *Charter*'s guarantees and values. An administrative law approach recognizes that administrative decision-makers are both bound by fundamental values and empowered to adjudicate them, and that administrative discretion is exercised in light of constitutional guarantees and the values they reflect. An administrative decision-maker exercising a discretionary power under his or her home statute, has, by virtue of expertise and specialization, particular familiarity with the competing considerations at play in weighing *Charter* values and will generally be in the best position to consider the impact of the relevant *Charter* guarantee on the specific facts of the case. Under a robust conception

cette dernière et exécutée suivant le modèle énoncé dans l'arrêt *Oakes*, la Cour d'appel a confirmé la réprimande. Elle a conclu que la lettre de D revêtait une importance limitée par rapport aux valeurs sous-jacentes à la liberté d'expression, que la décision du Comité avait un lien rationnel avec l'important objectif que constitue la protection du public et que la décision avait des effets proportionnels aux objectifs qu'elle visait.

Arrêt : Le pourvoi quant à l'issue est rejeté.

Pour déterminer si les décideurs administratifs ont exercé le pouvoir discrétionnaire que leur confère la loi en s'assurant de protéger les droits visés par la *Charte*, il faut effectuer la révision selon la démarche ressortissant au droit administratif, et non selon l'analyse fondée sur l'article premier, élaborée dans *Oakes*. La norme de contrôle est celle du caractère raisonnable.

Lorsque nous cherchons à déterminer si une loi viole la *Charte*, nous mettons en balance les objectifs urgents et réels du gouvernement, d'une part, et le degré d'atteinte au droit en cause protégé par la *Charte*, d'autre part. Si la loi ne restreint pas plus le droit qu'il n'est raisonnablement nécessaire de le faire pour atteindre les objectifs visés, la violation sera jugée proportionnelle et, de ce fait, la restriction raisonnable au sens de l'article premier. Toutefois, lorsque nous nous demandons si une décision en matière contentieuse viole la *Charte*, nous sommes appelés à mettre en balance des considérations quelque peu différentes, bien que liées. En effet, il s'agit alors de déterminer si le décideur a restreint le droit protégé par la *Charte* de manière disproportionnée et donc déraisonnable. Dans les deux cas, nous cherchons à savoir si un juste équilibre a été atteint entre les droits et les objectifs et, dans les deux cas aussi, les exercices visent à garantir que les droits en cause ne sont pas restreints de manière déraisonnable.

Rien dans l'approche du droit administratif n'est intrinsèquement incompatible avec la solide protection conférée par la *Charte* des garanties qui y sont énoncées et des valeurs qui y sont consacrées. L'approche du droit administratif reconnaît que les décideurs administratifs sont à la fois liés par des valeurs fondamentales et habilités à statuer sur elles et que le pouvoir discrétionnaire de nature administrative est exercé à l'aune des garanties constitutionnelles et des valeurs qu'elles comportent. Le décideur administratif exerçant un pouvoir discrétionnaire en vertu de sa loi constitutive est, de par son expertise et sa spécialisation, particulièrement au fait des considérations opposées en jeu dans la mise en balance des valeurs consacrées par la *Charte* et est généralement le mieux placé pour juger de

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of administrative law, discretion is exercised in light of constitutional guarantees and the values they reflect.

When applying *Charter* values in the exercise of statutory discretion, an administrative decision-maker must balance *Charter* values with the statutory objectives by asking how the *Charter* value at issue will best be protected in light of those objectives. This is at the core of the proportionality exercise, and requires the decision-maker to balance the severity of the interference of the *Charter* protection with the statutory objectives.

On judicial review, the question becomes whether, in assessing the impact of the relevant *Charter* protection and given the nature of the decision and the statutory and factual contexts, the decision reflects a proportionate balancing of the *Charter* rights and values at play. Though this judicial review is conducted within the administrative framework, there is nonetheless conceptual harmony between a reasonableness review and the *Oakes* framework, since both contemplate giving a "margin of appreciation", or deference, to administrative and legislative bodies in balancing *Charter* values against broader objectives. In the *Charter* context, the reasonableness analysis is one that centres on proportionality, that is, on ensuring that the decision interferes with the relevant *Charter* guarantee no more than is necessary given the statutory objectives. If the decision is disproportionately impairing of the guarantee, it is unreasonable. If, on the other hand, it reflects a proper balance of the mandate with *Charter* protection, it is a reasonable one. But both decision-makers and reviewing courts must remain conscious of the fundamental importance of *Charter* values in the analysis.

Here, the decision to suspend D for 21 days was not before the Court. The only issue was whether the Council's decision to reprimand D reflected a proportionate balancing of the lawyer's expressive rights with its statutory mandate to ensure that lawyers behave with "objectivity, moderation and dignity" in accordance with art. 2.03 of the *Code of ethics*. In dealing

l'incidence de la protection conférée par la *Charte* au regard des faits précis de l'affaire. Selon une conception plus riche du droit administratif, le pouvoir discrétionnaire est exercé à l'aune des garanties constitutionnelles et des valeurs qu'elles comportent.

En appliquant les valeurs de la *Charte* dans l'exercice de son pouvoir discrétionnaire conféré par la loi, le décideur administratif doit mettre en balance les valeurs consacrées par la *Charte* et les objectifs visés par la loi et se demander comment protéger au mieux la valeur en jeu compte tenu des objectifs en question. Cette réflexion constitue l'essence même de l'analyse de la proportionnalité et exige que le décideur mette en balance la gravité de l'atteinte à la valeur protégée par la *Charte*, d'une part, et les objectifs que vise la loi, d'autre part.

Dans le contexte d'une révision judiciaire, il s'agit donc de déterminer si — en évaluant l'incidence de la protection pertinente offerte par la *Charte* et compte tenu de la nature de la décision et des contextes légal et factuel — la décision est le fruit d'une mise en balance proportionnée des droits et des valeurs en cause protégés par la *Charte*. Même si cette révision judiciaire est menée selon le cadre d'analyse du droit administratif, il existe néanmoins une harmonie conceptuelle entre l'examen du caractère raisonnable et le cadre d'analyse préconisé dans *Oakes* puisque les deux démarches supposent de donner une marge d'appréciation aux organes administratifs ou législatifs ou de faire preuve de déférence à leur égard lors de la mise en balance des valeurs consacrées par la *Charte*, d'une part, et les objectifs plus larges, d'autre part. Dans le contexte de la *Charte*, l'analyse du caractère raisonnable porte avant tout sur la proportionnalité, soit, sur la nécessité d'assurer que la décision n'interfère avec la garantie visée par la *Charte* pas plus qu'il n'est nécessaire compte tenu des objectifs visés par la loi. Si la décision porte atteinte à la garantie de manière disproportionnée, elle est déraisonnable. Si, par contre, elle établit un juste équilibre entre le mandat et la protection conférée par la *Charte*, elle est raisonnable. Cela étant dit, tant les décideurs que les tribunaux qui procèdent à la révision de leurs décisions doivent analyser les questions qui leur sont soumises en gardant à l'esprit l'importance fondamentale des valeurs consacrées par la *Charte*.

La Cour n'était pas appelée en l'espèce à se prononcer sur la décision de suspendre le droit de pratique de D durant 21 jours. La seule question à trancher était celle de savoir si la décision du Comité de réprimander l'avocat a établi un juste équilibre, soit un équilibre proportionné, entre le droit de l'avocat à la libre expression et le mandat légal du Comité — qui consiste à garantir

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with the appropriate boundaries of civility for a lawyer, the severity of the conduct must be interpreted in light of the expressive rights guaranteed by the *Charter*, and, in particular, the public benefit in ensuring the right of lawyers to express themselves about the justice system in general and judges in particular. We are, in other words, balancing the fundamental importance of open, and even forceful, criticism of our public institutions with the need to ensure civility in the profession. Disciplinary bodies must therefore demonstrate that they have given due regard to the importance of the expressive rights at issue, both in light of an individual lawyer's right to expression and the public's interest in open discussion. As with all disciplinary decisions, this balancing is a fact-dependent and discretionary exercise.

Proper respect for these expressive rights may involve disciplinary bodies tolerating a degree of discordant criticism. The fact that a lawyer is criticizing a judge, a tenured and independent participant in the justice system, may raise, not lower, the threshold for limiting a lawyer's expressive rights under the *Charter*. This does not, however, argue for an unlimited right on the part of lawyers to breach the legitimate public expectation that they will behave with civility. Lawyers potentially face criticisms and pressures on a daily basis. They are expected by the public, on whose behalf they serve, to endure them with civility and dignity. This is not always easy where the lawyer feels he or she has been unfairly provoked, as in this case. But it is precisely when a lawyer's equilibrium is unduly tested that he or she is particularly called upon to behave with transcendent civility. On the other hand, lawyers should not be expected to behave like verbal eunuchs. They not only have a right to speak their minds freely, they arguably have a duty to do so. But they are constrained by their profession to do so with dignified restraint.

A reprimand for a lawyer does not automatically flow from criticizing a judge or the judicial system. Such criticism, even when it is expressed vigorously, can be constructive. However in the context of disciplinary hearings, such criticism will be measured against

que les avocats agissent avec « objectivité, [. . .] modération et [. . .] dignité », conformément à l'art. 2.03 du *Code de déontologie*. Lorsqu'il s'agit de déterminer quand le comportement d'un avocat passe les bornes de la civilité, il faut tenir compte du droit à la liberté d'expression garanti par la *Charte* et, plus particulièrement, des avantages que procure à l'ensemble de la population l'exercice par les avocats du droit de s'exprimer au sujet du système de justice en général et au sujet des juges en particulier. Autrement dit, les valeurs mises en balance sont, d'une part, l'importance fondamentale d'une critique ouverte et même vigoureuse de nos institutions publiques et, d'autre part, la nécessité d'assurer la civilité dans l'exercice de la profession juridique. Les organes disciplinaires doivent donc démontrer qu'ils ont dûment tenu compte de l'importance du droit à la liberté d'expression en cause, tant dans la perspective du droit d'expression individuel des avocats que dans celle de l'intérêt public à l'ouverture des débats. Comme pour toutes les décisions disciplinaires, cette mise en balance dépend des faits et suppose l'exercice d'un pouvoir discrétionnaire.

Il peut découler du respect qui est dû à ce droit à la liberté d'expression que des organismes disciplinaires tolèrent certaines critiques acérées. Le fait qu'un avocat critique un juge, un acteur indépendant et nommé à titre inamovible du système de justice, pourrait hausser, et non abaisser, le seuil au-delà duquel il convient de limiter l'exercice par un avocat du droit à la liberté d'expression que lui garantit la *Charte*. Cela étant dit, il ne faut surtout pas voir là d'argument pour un droit illimité des avocats de faire fi de la civilité que la société est en droit d'attendre d'eux. Les avocats sont susceptibles d'être critiqués et de subir des pressions quotidiennement. Le public, au nom de qui ils exercent, s'attend à ce que ces officiers de justice encaissent les coups avec civilité et dignité. Ce n'est pas toujours facile lorsque l'avocat a le sentiment qu'il a été injustement provoqué comme en l'espèce. Il n'en demeure pas moins que c'est précisément dans les situations où le sang-froid de l'avocat est indûment testé qu'il est tout particulièrement appelé à adopter un comportement d'une civilité transcendante. Cela étant dit, on ne peut s'attendre à ce que les avocats se comportent comme des eunuques de la parole. Ils ont non seulement le droit d'exprimer leurs opinions librement, mais possiblement le devoir de le faire. Ils sont toutefois tenus par leur profession de s'exécuter avec une retenue pleine de dignité.

Un avocat qui critique un juge ou le système judiciaire n'est pas automatiquement passible d'une réprimande. Une telle critique, même exprimée vigoureusement, peut être constructive. Cependant, dans le contexte d'audiences disciplinaires, une telle critique

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the public's reasonable expectations of a lawyer's professionalism. As the Disciplinary Council found, D's letter was outside those expectations. His displeasure with the judge was justifiable, but the extent of the response was not.

In light of the excessive degree of vituperation in the letter's context and tone, the Council's decision that D's letter warranted a reprimand represented a proportional balancing of D's expressive rights with the statutory objective of ensuring that lawyers behave with "objectivity, moderation and dignity". The decision is, as a result, a reasonable one.

Cases Cited

Discussed: *Multani v. Commission scolaire Marguerite-Bourgeoys*, 2006 SCC 6, [2006] 1 S.C.R. 256; *Chamberlain v. Surrey School District No. 36*, 2002 SCC 86, [2002] 4 S.C.R. 710; *Pinet v. St. Thomas Psychiatric Hospital*, 2004 SCC 21, [2004] 1 S.C.R. 528; *Ontario (Public Safety and Security) v. Criminal Lawyers' Association*, 2010 SCC 23, [2010] 1 S.C.R. 815; *Slaight Communications Inc. v. Davidson*, [1989] 1 S.C.R. 1038; *R. v. Oakes*, [1986] 1 S.C.R. 103; *Baker v. Canada (Minister of Citizenship and Immigration)*, [1999] 2 S.C.R. 817; *Canadian Union of Public Employees, Local 963 v. New Brunswick Liquor Corp.*, [1979] 2 S.C.R. 227; *Dunsmuir v. New Brunswick*, 2008 SCC 9, [2008] 1 S.C.R. 190; *R. v. Conway*, 2010 SCC 22, [2010] 1 S.C.R. 765; *Stoffman v. Vancouver General Hospital*, [1990] 3 S.C.R. 483; *Dagenais v. Canadian Broadcasting Corp.*, [1994] 3 S.C.R. 835; *Ross v. New Brunswick School District No. 15*, [1996] 1 S.C.R. 825; *Eldridge v. British Columbia (Attorney General)*, [1997] 3 S.C.R. 624; *Little Sisters Book and Art Emporium v. Canada (Minister of Justice)*, 2000 SCC 69, [2000] 2 S.C.R. 1120; *United States v. Burns*, 2001 SCC 7, [2001] 1 S.C.R. 283; *R. v. Mentuck*, 2001 SCC 76, [2001] 3 S.C.R. 442; *Trinity Western University v. British Columbia College of Teachers*, 2001 SCC 31, [2001] 1 S.C.R. 772; *Ahani v. Canada (Minister of Citizenship and Immigration)*, 2002 SCC 2, [2002] 1 S.C.R. 72; *Lake v. Canada (Minister of Justice)*, 2008 SCC 23, [2008] 1 S.C.R. 761; *Canada (Prime Minister) v. Khadr*, 2010 SCC 3, [2010] 1 S.C.R. 44; *Németh v. Canada (Justice)*, 2010 SCC 56, [2010] 3 S.C.R. 281; **referred to:** *Catalyst Paper Corp. v. North Cowichan (District)*, 2012 SCC 2, [2012] 1 S.C.R. 5; *R. v. Lanthier*, 2001 CanLII 9351; *Alberta v. Hutterian Brethren of Wilson Colony*, 2009 SCC 37, [2009] 2 S.C.R. 567; *Suresh v. Canada (Minister of Citizenship and Immigration)*,

sera évaluée à la lumière des attentes raisonnables du public quant au professionnalisme dont un avocat doit faire preuve. Comme l'a conclu le Comité de discipline, la lettre de D ne satisfait pas à ces attentes. Son mécontentement à l'égard du juge était légitime, mais la teneur de sa réponse ne l'était pas.

À la lumière du degré excessif de vitupération dans le contenu de la lettre et de son ton, la conclusion du Comité selon lequel la lettre de D justifiait qu'il soit réprimandé repose sur un juste équilibre, soit un équilibre proportionné, entre le droit de D à la libre expression et l'objectif de la loi qui consiste à garantir que les avocats agissent avec « objectivité, modération et dignité ». Par conséquent, cette décision est raisonnable.

Jurisprudence

Arrêts analysés : *Multani c. Commission scolaire Marguerite-Bourgeoys*, 2006 CSC 6, [2006] 1 R.C.S. 256; *Chamberlain c. Surrey School District No. 36*, 2002 CSC 86, [2002] 4 R.C.S. 710; *Pinet c. St. Thomas Psychiatric Hospital*, 2004 CSC 21, [2004] 1 R.C.S. 528; *Ontario (Sûreté et Sécurité publique) c. Criminal Lawyers' Association*, 2010 CSC 23, [2010] 1 R.C.S. 815; *Slaight Communications Inc. c. Davidson*, [1989] 1 R.C.S. 1038; *R. c. Oakes*, [1986] 1 R.C.S. 103; *Baker c. Canada (Ministre de la Citoyenneté et de l'Immigration)*, [1999] 2 R.C.S. 817; *Syndicat canadien de la Fonction publique, section locale 963 c. Société des alcools du Nouveau-Brunswick*, [1979] 2 R.C.S. 227; *Dunsmuir c. Nouveau-Brunswick*, 2008 CSC 9, [2008] 1 R.C.S. 190; *R. c. Conway*, 2010 CSC 22, [2010] 1 R.C.S. 765; *Stoffman c. Vancouver General Hospital*, [1990] 3 R.C.S. 483; *Dagenais c. Société Radio-Canada*, [1994] 3 R.C.S. 835; *Ross c. Conseil scolaire du district n^o^ 15 du Nouveau-Brunswick*, [1996] 1 R.C.S. 825; *Eldridge c. Colombie-Britannique (Procureur général)*, [1997] 3 R.C.S. 624; *Little Sisters Book and Art Emporium c. Canada (Ministre de la Justice)*, 2000 CSC 69, [2000] 2 R.C.S. 1120; *États-Unis c. Burns*, 2001 CSC 7, [2001] 1 R.C.S. 283; *R. c. Mentuck*, 2001 CSC 76, [2001] 3 R.C.S. 442; *Université Trinity Western c. British Columbia College of Teachers*, 2001 CSC 31, [2001] 1 R.C.S. 772; *Ahani c. Canada (Ministre de la Citoyenneté et de l'Immigration)*, 2002 CSC 2, [2002] 1 R.C.S. 72; *Lake c. Canada (Ministre de la Justice)*, 2008 CSC 23, [2008] 1 R.C.S. 761; *Canada (Premier ministre) c. Khadr*, 2010 CSC 3, [2010] 1 R.C.S. 44; *Németh c. Canada (Justice)*, 2010 CSC 56, [2010] 3 R.C.S. 281; **arrêts mentionnés :** *Catalyst Paper Corp. c. North Cowichan (District)*, 2012 CSC 2, [2012] 1 R.C.S. 5; *R. c. Lanthier*, 2001 CanLII 9351; *Alberta c. Hutterian Brethren of Wilson Colony*, 2009 CSC 37,

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APPEAL from a judgment of the Quebec Court of Appeal (Rochon, Dufresne and Léger JJ.A.), 2010 QCCA 24, [2010] R.J.Q. 77, 326 D.L.R. (4th) 749, [2010] Q.J. No. 88 (QL), 2010 CarswellQue 13368, affirming a decision of Déziel J., 2008 QCCS 2450 (CanLII), [2008] J.Q. nº 5222 (QL), 2008 CarswellQue 5285, dismissing an application for judicial review of a decision of the Tribunal des professions, 2007 QCTP 152 (CanLII), [2007] D.T.P.Q. nº 152 (QL). Appeal dismissed.

Sophie Dormeau and *Sophie Préfontaine*, for the appellant.

Claude G. Leduc and *Luce Bastien*, for the respondent Pierre Bernard, in his capacity as Assistant Syndic of the Barreau du Québec.

Dominique A. Jobin and *Noémi Potvin*, for the respondents Tribunal des professions and the Attorney General of Quebec.

Babak Barin and *Frédéric Côté*, for the intervener the Federation of Law Societies of Canada.

David Grossman, Sylvain Lussier, *Julien Morissette* and *Annie Gallant*, for the intervener the Canadian Civil Liberties Association.

Mathieu Bouchard and *Audrey Boctor*, for the intervener the Young Bar Association of Montreal.

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POURVOI contre un arrêt de la Cour d'appel du Québec (les juges Rochon, Dufresne et Léger), 2010 QCCA 24, [2010] R.J.Q. 77, 326 D.L.R. (4th) 749, [2010] J.Q. nº 88 (QL), 2010 CarswellQue 77, qui a confirmé une décision du juge Déziel, 2008 QCCS 2450 (CanLII), [2008] J.Q. nº 5222 (QL), 2008 CarswellQue 5285, qui avait rejeté une requête en révision judiciaire d'une décision du Tribunal des professions, 2007 QCTP 152 (CanLII), [2007] D.T.P.Q. nº 152 (QL). Pourvoi rejeté.

Sophie Dormeau et *Sophie Préfontaine*, pour l'appelant.

Claude G. Leduc et *Luce Bastien*, pour l'intimé Pierre Bernard, ès qualités de syndic adjoint du Barreau du Québec.

Dominique A. Jobin et *Noémi Potvin*, pour les intimés le Tribunal des professions et le procureur général du Québec.

Babak Barin et *Frédéric Côté*, pour l'intervenante la Fédération des ordres professionnels de juristes du Canada.

David Grossman, *Sylvain Lussier*, *Julien Morissette* et *Annie Gallant*, pour l'intervenante l'Association canadienne des libertés civiles.

Mathieu Bouchard et *Audrey Boctor*, pour l'intervenante l'Association du Jeune Barreau de Montréal.

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The judgment of the Court was delivered by

[1] Abella J. — The focus of this appeal is on the decision of a disciplinary body to reprimand a lawyer for the content of a letter he wrote to a judge after a court proceeding.

[2] The lawyer does not challenge the constitutionality of the provision in the *Code of ethics* under which he was reprimanded. Nor, before us, does he challenge the length of the suspension he received. What he *does* challenge, is the constitutionality of the decision itself, claiming that it violates his freedom of expression under the *Canadian Charter of Rights and Freedoms*.

[3] This raises squarely the issue of how to protect *Charter* guarantees and the values they reflect in the context of adjudicated administrative decisions. Normally, if a discretionary administrative decision is made by an adjudicator within his or her mandate, that decision is judicially reviewed for its reasonableness. The question is whether the presence of a *Charter* issue calls for the replacement of this administrative law framework with the *Oakes* test, the test traditionally used to determine whether the state has justified a law's violation of the *Charter* as a "reasonable limit" under s. 1.

[4] It seems to me to be possible to reconcile the two regimes in a way that protects the integrity of each. The way to do that is to recognize that an adjudicated administrative decision is not like a law which can, theoretically, be objectively justified by the state, making the traditional s. 1 analysis an awkward fit. On whom does the onus lie, for example, to formulate and assert the pressing and substantial objective of an adjudicated decision, let alone justify it as rationally connected to, minimally impairing of, and proportional to that objective? On the other hand, the protection of *Charter* guarantees is a fundamental and

Version française du jugement de la Cour rendu par

[1] La juge Abella — Le présent appel porte principalement sur la décision d'un comité de discipline de réprimander un avocat pour le contenu d'une lettre qu'il a écrite à un juge après une audience.

[2] L'avocat ne conteste pas la constitutionnalité de la disposition du *Code de déontologie* en vertu de laquelle il a été sanctionné. Il ne conteste pas non plus, devant nous, la durée de la suspension qui lui a été infligée. Ce qu'il conteste, c'est la constitutionnalité de la décision elle-même, puisqu'il prétend qu'elle enfreint la liberté d'expression que lui garantit la *Charte canadienne des droits et libertés*.

[3] Cela pose, sans détour, la question de la protection des garanties visées par la *Charte* et des valeurs qu'elles reflètent, dans le contexte des décisions administratives en matières contentieuses. Normalement, si un décideur a rendu une décision administrative conforme à son mandat en exerçant un pouvoir discrétionnaire, la révision judiciaire qui la concerne vise à juger de son caractère raisonnable. Ainsi, la question à trancher est celle de savoir si la présence d'une question relative à la *Charte* appelle le remplacement de ce cadre d'analyse de droit administratif par le test énoncé dans *R. c. Oakes*, [1986] 1 R.C.S. 103, test utilisé traditionnellement pour déterminer si l'État a justifié la violation de la *Charte* par une loi en démontrant que cette violation s'inscrit dans les limites raisonnables au sens de l'article premier.

[4] Il me semble possible de concilier les deux régimes de manière à protéger l'intégrité de chacun d'entre eux. Pour ce faire, il faut reconnaître qu'une décision administrative en matière contentieuse n'est pas assimilable à une loi qui peut, en théorie, être objectivement justifiée par l'État et que, dans ce contexte, l'analyse traditionnelle fondée sur l'article premier est boiteuse. Sur qui pèserait, par exemple, le fardeau de formuler et de défendre l'objectif urgent et réel d'une telle décision administrative, sans parler du fardeau de démontrer l'existence d'un lien rationnel, d'une atteinte minimale ainsi que la proportionnalité de cette atteinte

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pervasive obligation, no matter which adjudicative forum is applying it. How then do we ensure this rigorous *Charter* protection while at the same time recognizing that the assessment must necessarily be adjusted to fit the contours of what is being assessed and by whom?

[5] We do it by recognizing that while a formulaic application of the *Oakes* test may not be workable in the context of an adjudicated decision, distilling its essence works the same justificatory muscles: balance and proportionality. I see nothing in the administrative law approach which is inherently inconsistent with the strong *Charter* protection — meaning its guarantees and values — we expect from an *Oakes* analysis. The notion of deference in administrative law should no more be a barrier to effective *Charter* protection than the margin of appreciation is when we apply a full s. 1 analysis.

[6] In assessing whether a law violates the *Charter*, we are balancing the government's pressing and substantial objectives against the extent to which they interfere with the *Charter* right at issue. If the law interferes with the right no more than is reasonably necessary to achieve the objectives, it will be found to be proportionate, and, therefore, a reasonable limit under s. 1. In assessing whether an adjudicated decision violates the *Charter*, however, we are engaged in balancing somewhat different but related considerations, namely, has the decision-maker disproportionately, and therefore unreasonably, limited a *Charter* right. In both cases, we are looking for whether there is an appropriate balance between rights and objectives, and the purpose of both exercises is to ensure that the rights at issue are not unreasonably limited.

à l'objectif visé? Par ailleurs, la protection des garanties visées par la *Charte* constitue une obligation fondamentale et omniprésente, quel que soit le forum décisionnel qui en assure l'application. Dans ce contexte, comment pouvons-nous assurer cette protection constitutionnelle rigoureuse tout en reconnaissant que l'évaluation doit nécessairement être modulée de manière à ce qu'elle soit adaptée à ce qui est évalué et à l'instance qui y procède?

[5] Nous le faisons en reconnaissant que même si l'application convenue du test énoncé dans *Oakes* pourrait ne pas convenir dans le contexte d'une décision administrative en matière contentieuse, en extraire l'essence fait intervenir les mêmes réflexes justificateurs : l'équilibre et la proportionnalité. Je ne vois rien dans l'approche du droit administratif qui soit intrinsèquement incompatible avec la solide protection conférée par la *Charte* — soit la protection des garanties qui y sont énoncées et des valeurs qu'elle consacre — que nous attendons d'une analyse conforme à *Oakes*. De plus, la notion de déférence applicable en droit administratif ne devrait pas plus constituer un obstacle à une protection constitutionnelle efficace que ne le fait la marge d'appréciation quand nous appliquons l'analyse complète fondée sur l'article premier.

[6] Lorsque nous cherchons à déterminer si une loi viole la *Charte*, nous mettons en balance les objectifs urgents et réels du gouvernement, d'une part, et le degré d'atteinte au droit en cause protégé par la *Charte*, d'autre part. Si la loi ne restreint pas plus le droit qu'il n'est raisonnablement nécessaire de le faire pour atteindre les objectifs visés, la violation sera jugée proportionnelle et, de ce fait, la restriction raisonnable au sens de l'article premier. Toutefois, lorsque nous nous demandons si une décision en matière contentieuse viole la *Charte*, nous sommes appelés à mettre en balance des considérations quelque peu différentes, bien que liées. En effet, il s'agit alors de déterminer si le décideur a restreint le droit protégé par la *Charte* de manière disproportionnée et donc déraisonnable. Dans les deux cas, nous cherchons à savoir si un juste équilibre a été atteint entre les droits et les objectifs et, dans les deux cas aussi, les exercices visent à garantir que les droits en cause ne sont pas restreints de manière déraisonnable.

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[7] As this Court has noted, most recently in *Catalyst Paper Corp. v. North Cowichan (District)*, 2012 SCC 2, [2012] 1 S.C.R. 5, the nature of the reasonableness analysis is always contingent on its context. In the *Charter* context, the reasonableness analysis is one that centres on proportionality, that is, on ensuring that the decision interferes with the relevant *Charter* guarantee no more than is necessary given the statutory objectives. If the decision is disproportionately impairing of the guarantee, it is unreasonable. If, on the other hand, it reflects a proper balance of the mandate with *Charter* protection, it is a reasonable one.

[8] In this case, the discipline committee's decision to reprimand the lawyer reflected a proportionate balancing of its public mandate to ensure that lawyers behave with "objectivity, moderation and dignity" with the lawyer's expressive rights. It is, as a result, a reasonable one.

Background

[9] Gilles Doré was counsel for Daniel Lanthier in criminal proceedings. On June 18 and 19, 2001, Mr. Doré appeared before Boilard J. in the Superior Court of Quebec seeking a stay of proceedings or, in the alternative, the release of his client on bail. In the course of Mr. Doré's argument, Justice Boilard said about him that [TRANSLATION] "an insolent lawyer is rarely of use to his client". In his written reasons rejecting Mr. Doré's application on June 21, 2001, Boilard J. levied further criticism (*R. v. Lanthier*, 2001 CanLII 9351). He accused Mr. Doré of [TRANSLATION] "bombastic rhetoric and hyperbole" and said that the court must "put aside" Mr. Doré's "impudence". Justice Boilard characterized Mr. Doré's request for a stay as "totally ridiculous" and one of his arguments as "idle quibbling". Finally, he said that "fixated on or obsessed with his narrow vision of reality, which is not consistent with the facts, Mr. Doré has done nothing to help his client discharge his burden".

[7] Comme la Cour l'a déjà souligné, le plus récemment dans l'arrêt *Catalyst Paper Corp. c. North Cowichan (District)*, 2012 CSC 2, [2012] 1 R.C.S. 5, la nature de l'analyse du caractère raisonnable est toujours tributaire du contexte. Dans celui de la *Charte*, cette analyse du caractère raisonnable porte avant tout sur la proportionnalité, soit, sur la nécessité d'assurer que la décision n'interfère avec la garantie visée par la *Charte* pas plus qu'il n'est nécessaire compte tenu des objectifs visés par la loi. Si la décision porte atteinte à la garantie de manière disproportionnée, elle est déraisonnable. Si, par contre, elle établit un juste équilibre entre le mandat et la protection conférée par la *Charte*, elle est raisonnable.

[8] En l'espèce, la décision du Comité de discipline de réprimander l'avocat a établi un juste équilibre, soit un équilibre proportionné, entre son mandat — qui consiste à garantir que les avocats agissent avec « objectivité, [. . .] modération et [. . .] dignité » — et le droit de l'avocat concerné à la libre expression. Par conséquent, cette décision est raisonnable.

Contexte

[9] M^e Gilles Doré représentait M. Daniel Lanthier dans une instance criminelle. Les 18 et 19 juin 2001, il comparaissait devant le juge Boilard de la Cour supérieure du Québec pour demander l'arrêt des procédures ou, subsidiairement, la mise en liberté sous caution de son client. Au cours de la plaidoirie de M^e Doré, le juge Boilard a dit à son sujet qu'« un avocat insolent est rarement utile à son client ». Dans les motifs écrits de la décision rendue le 21 juin 2001 par laquelle il a rejeté la requête de M^e Doré, le juge Boilard a formulé d'autres critiques à l'égard de l'avocat (*R. c. Lanthier*, 2001 CanLII 9351), l'accusant de faire de la « rhétorique ronflante et de l'hyperbole », ajoutant que la cour devait « mettre de côté » son « outrecuidance ». Il a qualifié la requête de M^e Doré de « tout à fait ridicule » et l'un de ses arguments d'« argutie sans fondement ». Enfin, il a également écrit qu'« obnubilé ou obsédé dans sa vision d'une réalité étriquée, non conforme aux faits, M^e Doré n'a rien fait pour assister son client à se décharger de son fardeau ».

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[10] On June 21, 2001, Mr. Doré wrote a private letter to Justice Boilard, stating:

[TRANSLATION]

WITHOUT PREJUDICE OR ADMISSION

Sir,

I have just left the Court. Just a few minutes ago, as you hid behind your status like a coward, you made comments about me that were both unjust and unjustified, scattering them here and there in a decision the good faith of which will most likely be argued before our Court of Appeal.

Because you ducked out quickly and refused to hear me, I have chosen to write a letter as an entirely personal response to the equally personal remarks you permitted yourself to make about me. This letter, therefore, is from man to man and is outside the ambit of my profession and your functions.

If no one has ever told you the following, then it is high time someone did. Your chronic inability to master any social skills (to use an expression in English, that language you love so much), which has caused you to become pedantic, aggressive and petty in your daily life, makes no difference to me; after all, it seems to suit you well.

Your deliberate expression of these character traits while exercising your judicial functions, however, and your having made them your trademark concern me a great deal, and I feel that it is appropriate to tell you.

Your legal knowledge, which appears to have earned the approval of a certain number of your colleagues, is far from sufficient to make you the person you could or should be professionally. Your determination to obliterate any humanity from your judicial position, your essentially non-existent listening skills, and your propensity to use your court — where you lack the courage to hear opinions contrary to your own — to launch ugly, vulgar, and mean personal attacks not only confirms that you are as loathsome as suspected, but also casts shame on you as a judge, that most extraordinarily important function that was entrusted to you.

I would have very much liked to say this to your face, but I highly doubt that, given your arrogance, you are able to face your detractors without hiding behind your judicial position.

[10] Le 21 juin 2001, M^e^ Doré a adressé une lettre privée au juge Boilard, dans laquelle il écrivait :

SOUS RÉSERVE ET SANS ADMISSION

Monsieur,

Je sors à peine de cour. Il y a quelques minutes, vous cachant lâchement derrière votre statut, vous avez tenu à mon égard des propos aussi injustes qu'injustifiés, parsemés ici et là dans une décision dont la bonne foi sera vraisemblablement débattue devant notre Cour d'appel.

Comme vous vous êtes défilé rapidement et avez refusé de m'entendre, je choisis la forme épistolaire pour répondre à titre purement personnel aux propos tout aussi personnels que vous vous êtes permis à mon endroit. La présente est donc d'homme à homme, hors le circuit de ma profession et de vos fonctions.

Si ce qui suit ne vous a jamais été signalé, il était grand temps que ça le soit. Si votre incapacité chronique à maîtriser quelque aptitude sociale (« *social skills* » vous qui aimez tant l'anglais) vous a amené à adopter un comportement pédant, hargneux et mesquin dans votre vie de tous les jours, peu m'importe; cela semble après tout vous convenir.

Si toutefois, délibérément, vous importez ces traits de caractère dans l'exercice de votre magistrature et que vous en faites votre marque de commerce, cela m'importe beaucoup et il me semble approprié de vous en faire part.

En effet, vos connaissances juridiques qui semblent rallier l'approbation d'un certain nombre de vos collègues, sont loin d'être suffisantes pour faire de vous ce que vous auriez pu et du [*sic*] être au plan professionnel. Votre détermination à évacuer toute humanité de votre magistrature, votre capacité d'écoute à toutes fins pratiques nulle et votre propension à vous servir de votre tribune — de laquelle vous n'avez pas le courage de faire face à l'expression d'opinions contraires aux vôtres — pour vous adonner à des attaques personnelles d'une mesquinerie à ce point repoussante qu'elles en sont vulgaires, non seulement confirme [*sic*] l'être exécrable qu'on devine mais encore, font de votre magistrature une honte pour ce poste extraordinairement important qui vous fut jadis confié.

J'aurais bien aimé vous en faire part personnellement mais je doute fort que dans votre arrogance et en l'absence de votre paravent judiciaire, vous soyez capable de faire face à vos détracteurs.

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Worst of all, you possess the most appalling of all defects for a man in your position: You are fundamentally unjust. I doubt that that will ever change.

Sincerely,

Gilles Doré

P.S. As this letter is purely personal, I see no need to distribute it.

(C.A. judgment, 2010 QCCA 24, 326 D.L.R. (4th) 749, at para. 5)

[11] The next day, June 22, 2001, Mr. Doré wrote to Chief Justice Lyse Lemieux, with a copy to Justice Boilard. He made it clear that he was not filing a complaint with her against Justice Boilard. Instead, Mr. Doré respectfully requested that he not be required to appear before Justice Boilard in the future since he was concerned that he could not properly represent his clients before him.

[12] On July 10, 2001, Mr. Doré complained to the Canadian Judicial Council about Justice Boilard's conduct. On July 13, 2001, Chief Justice Lemieux sent a copy of the letter Mr. Doré had sent to Justice Boilard to the Syndic du Barreau, the body that disciplines lawyers in Quebec.

[13] In March 2002, the Assistant Syndic filed a complaint against Mr. Doré based on his letter to Justice Boilard. The complaint alleged that Mr. Doré had violated both art. 2.03 of the *Code of ethics of advocates*, R.R.Q. 1981, c. B-1, r. 1, and Mr. Doré's oath of office. Article 2.03 stated: "The conduct of an advocate must bear the stamp of objectivity, moderation and dignity."

[14] In the interval between the filing of the Assistant Syndic's complaint against Mr. Doré and the actual proceedings against him, a committee of judges appointed by the Judicial Council to look into Mr. Doré's complaint communicated its conclusions to Mr. Doré and Justice Boilard in letters sent on July 15, 2002. The committee found that

Pis encore, vous avez la pire des tares pour un homme de votre position : vous êtes foncièrement injuste et je doute que cela puisse changer un jour.

Sincèrement,

Gilles Doré

P.S. Comme cette missive est à titre purement personnelle [*sic*], je ne vois nullement la nécessité d'en faire la diffusion.

(Jugement de la C.A., 2010 QCCA 24 (CanLII), par. 5)

[11] Le lendemain, soit le 22 juin 2001, M[e] Doré a écrit à la juge en chef Lyse Lemieux et expédié une copie conforme de cette lettre au juge Boilard. Il a clairement indiqué que cette démarche ne constituait pas une plainte à l'endroit du juge Boilard. Il demandait plutôt, respectueusement, de ne plus avoir à plaider devant ce juge, parce qu'il craignait de ne pas pouvoir représenter ses clients adéquatement devant lui.

[12] Le 10 juillet 2001, M[e] Doré a saisi le Conseil canadien de la magistrature d'une plainte au sujet de la conduite du juge Boilard. Le 13 juillet 2001, la juge en chef Lemieux a transmis une copie de la lettre envoyée au juge Boilard par M[e] Doré au syndic du Barreau du Québec, l'organisme responsable dans cette province des questions disciplinaires concernant les avocats.

[13] Au mois de mars 2002, le syndic adjoint a formulé une plainte contre M[e] Doré fondée sur la lettre qu'il avait adressée au juge Boilard. Selon cette plainte, l'avocat avait contrevenu à l'art. 2.03 du *Code de déontologie des avocats*, R.R.Q. 1981, ch. B-1, r. 1, et manqué à son serment d'office. L'article 2.03 énonçait que : « [l]a conduite de l'avocat doit être empreinte d'objectivité, de modération et de dignité. »

[14] Entre le dépôt de la plainte du syndic adjoint contre M[e] Doré et l'audience disciplinaire, un comité de juges nommés par le Conseil canadien de la magistrature pour étudier la plainte formulée par M[e] Doré a communiqué ses conclusions au plaignant et au juge en leur expédiant des lettres le 15 juillet 2002. Le comité a conclu que le juge

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Justice Boilard had made [TRANSLATION] "unjustified derogatory remarks to Mr. Doré" stating, in part:

[TRANSLATION] . . . to use the words "bombastic rhetoric and hyperbole" and "impudence" in referring to counsel arguing a case before you, quite clearly in good faith, is unnecessarily insulting. To reply to counsel who submits that you have not allowed him to argue his case "that an insolent lawyer is rarely of use to his client" not only is unjustified in the circumstances, but could tarnish counsel's professional reputation in the eyes of his client, his peers and the public. To say to counsel arguing a case before you that "I have the impression this is going to be tiresome" is to gratuitously degrade him. To describe a procedure before the court as "totally ridiculous" is unnecessarily humiliating. It is the panel's opinion that such comments would seem to show contempt for counsel not only as an individual but also as a professional.

The evidence reveals a flagrant lack of respect for an officer of the court, namely Mr. Doré, who was nevertheless at all times respectful to the court. The evidence also shows signs of impatience on your part that are surprising in light of every judge's duty to listen calmly to the parties and to counsel. It is the panel's opinion that in so abusing your power as a judge, you not only tarnished your image as a dispenser of justice, but also undermined the judiciary, the image of which has unfortunately been diminished. The panel reminds you that your independence and your authority as a judge do not exempt you from respecting the dignity of every individual who argues a case before you. Dispensing justice while gratuitously insulting counsel is befitting neither for the judge nor for the judiciary.

Having also read the judgments of the Quebec Court of Appeal in *R. v. Proulx*, *R. v. Bisson* and *R. v. Callochia*, the panel observed that you tend to use your platform to unjustly denigrate counsel appearing before you. The transcript of the hearing of April 9, 2002 in *Sa Majesté la Reine v. Sébastien Beauchamp*, which contains evidence of personal attacks on another lawyer, also confirmed that the case raised in Mr. Doré's complaint is neither unique nor isolated, but shows that extreme conduct and comments seem to form part of a more generalized attitude. In the panel's view, the fact that such an attitude could persist despite warnings from the Court of Appeal is troubling.

Boilard avait fait des « remarques désobligeantes et injustifiées à M^e^ Doré » et il a notamment indiqué que de :

. . . parler de la « rhétorique ronflante et de l'hyperbole » et de l'« outrecuidance » de l'avocat qui plaide devant vous, de toute évidence de bonne foi, est inutilement offensant. Répliquer à un avocat, qui soumet que vous ne l'avez pas laissé plaider, « qu'un avocat insolent est rarement utile à son client » n'est [*sic*] non seulement injustifié dans les circonstances mais risque de porter atteinte à la réputation de l'avocat en tant que professionnel devant son client, ses paires [*sic*] et le public. Dire à un avocat qui plaide devant vous que « j'ai l'impression que cela va être pénible » abaisse gratuitement l'avocat. Qualifier une procédure devant la Cour « de tout à fait ridicule » est inutilement humiliant. Le sous-comité est d'avis que de tels commentaires sembleraient témoigner d'une attitude de dédain envers l'avocat non seulement en tant qu'individu, mais aussi en tant que professionnel.

La preuve décèle un manque flagrant de respect envers un officier de la Cour, dont M^e^ Doré qui, en tout temps, est néanmoins resté respectueux envers le Tribunal. La preuve révèle en outre des écarts d'impatience de votre part qui surprennent, face au devoir de tout juge d'écouter les parties et les avocats en toute sérénité. Le sous-comité est d'avis qu'en abusant ainsi de votre pouvoir de magistrat, vous avez non seulement terni votre image de justicier mais vous avez également porté atteinte à la magistrature, dont l'image en est sortie malheureusement amoindrie. Le sous-comité vous rappelle que votre indépendance et votre autorité en tant que juge ne vous dispensent pas de respecter la dignité de tout individu qui se trouve à plaider devant vous. Dispenser justice en insultant gratuitement l'avocat ne sied ni au juge, ni à la magistrature.

Ayant également pris connaissance des jugements de la Cour d'appel du Québec dans *R. c. Proulx*, *R. c. Bisson* et *R. c. Callochia*, le sous-comité a pu constater votre penchant à vous servir de votre tribune pour dénigrer injustement l'avocat qui paraît devant vous. La transcription de l'audience du 9 avril 2002 dans *Sa Majesté la Reine c. Sébastien Beauchamp*, qui témoigne d'attaques personnelles à l'encontre d'un autre avocat, est venue également confirmer que la plainte de M^e^ Doré ne soulève pas un cas unique ou isolé, mais témoigne d'un comportement et de propos excessifs qui semblent s'inscrire dans une attitude plus générale. Qu'une telle attitude puisse perdurer, malgré les avertissements de la Cour d'appel, est un constat troublant, de l'avis du sous-comité, pour autant que cela continue.

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The panel finds that the impatience you showed and the immoderate comments you made to an officer of the court, Mr. Doré, are unacceptable and merit an expression of the panel's disapproval under subsection 55(2) of the Canadian Judicial Council By-Laws.

The panel notes that you have deferred to its decision and assumes that the fact that Mr. Doré has made a complaint will lead you to reflect on this and will remind you of your duty as a judge to show respect and courtesy to all counsel who appear before you.

[15] On July 22, 2002, after receiving this reprimand, Justice Boilard recused himself from a complex criminal trial involving the Hell's Angels, a trial related to the trial of Daniel Lanthier in which Mr. Doré had acted. As a result of this recusal, the Attorney General of Quebec requested the Canadian Judicial Council to conduct an inquiry. The Judicial Council concluded that Justice Boilard's recusal had not constituted misconduct.

[16] As for Mr. Doré, the proceedings before the Disciplinary Council of the Barreau du Québec took place between April 2003 and January 2006. In its January 18, 2006 decision, the Disciplinary Council found that Mr. Doré's letter was [TRANSLATION] "likely to offend and is rude and insulting" (2006 CanLII 53416, at para. 58). It concluded that his statements had little expressive value, as they were "merely opinions, perceptions and insults" (para. 62). The Disciplinary Council rejected Mr. Doré's submission that his letter was private, since it was written by him as a lawyer. It also concluded that Justice Boilard's conduct could not be relied on as justification for the letter.

[17] The Disciplinary Council rejected Mr. Doré's argument that art. 2.03 violated s. 2(*b*) of the *Charter*. While acknowledging that the provision infringed on freedom of expression, the Disciplinary Council found that

[TRANSLATION] [t]his is a limitation on freedom of expression that is entirely reasonable, even necessary, in the Canadian legal system, where lawyers and

Le sous-comité est d'avis que vos écarts d'impatience et vos remarques immodérées faites à l'égard d'un officier de la Cour, M^e^ Doré, sont inacceptables et méritent la désapprobation du sous-comité conformément au paragraphe 55(2) du Règlement administratif du Conseil.

Le sous-comité a pris soin de noter que vous vous en remettiez à la décision du sous-comité et prend pour acquis que le fait que M^e^ Doré se soit plaint vous fasse réfléchir et vous rappelle votre obligation de magistrat de traiter tout avocat qui se présente devant vous avec respect et courtoisie.

[15] Le 22 juillet 2002, après avoir écopé de cette réprimande, le juge Boilard s'est récusé dans un procès complexe intenté contre les Hell's Angels et lié au procès dans lequel M^e^ Doré représentait M. Daniel Lanthier. Par suite de cette récusation, le procureur général du Québec a demandé au Conseil canadien de la magistrature de mener une enquête. Au terme de celle-ci, le Conseil a conclu que le juge Boilard ne s'était pas conduit de façon inappropriée en se récusant.

[16] Pour ce qui est de M^e^ Doré, l'audition de la plainte par le Comité de discipline du Barreau du Québec s'est déroulée entre les mois d'avril 2003 et de janvier 2006. Dans une décision rendue le 18 janvier 2006, le Comité de discipline a conclu que la lettre de M^e^ Doré « est de nature à choquer et constitue des propos grossiers et injurieux » (2006 CanLII 53416, par. 58). Il a jugé que les propos de l'avocat n'avaient que peu de valeur sur le plan expressif parce qu'il ne s'agissait que d'« opinions, [de] perceptions et [d']insultes » (par. 62). Le Comité de discipline a rejeté l'argument de M^e^ Doré selon lequel la lettre était de nature privée, jugeant que c'est en tant qu'avocat qu'il l'avait écrite. Il a également conclu que l'avocat ne pouvait invoquer la conduite du juge Boilard pour justifier la lettre.

[17] Le Comité de discipline a également rejeté l'argument de M^e^ Doré selon lequel l'art. 2.03 violerait l'al. 2*b*) de la *Charte*. Tout en reconnaissant que la disposition restreint la liberté d'expression, le Comité a conclu comme suit :

Il s'agit d'une restriction à la liberté d'expression qui est tout à fait raisonnable, voire même nécessaire dans le système de droit canadien où les avocats et les juges

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judges must work together in the interest of justice. [para. 88]

Moreover, it concluded that Mr. Doré had willingly joined a profession that was subject to rules of discipline that he knew would limit his freedom of expression. While the rules may [TRANSLATION] "be seen as restrictions imposed on the members of the Barreau in comparison to the freedom that may be enjoyed by other Canadian citizens", they are made in exchange for "the privileges conferred on lawyers as members of an 'exclusive profession'" (paras. 109-10). On July 24, 2006, based on what it found to be the seriousness of Mr. Doré's conduct and on his failure to show remorse, the same panel suspended Mr. Doré's ability to practise law for 21 days (2006 CanLII 53436).

[18] Mr. Doré appealed the Disciplinary Council's decisions to the Tribunal des professions on several grounds (2007 QCTP 152 (CanLII)). This time, he did not challenge the constitutionality of art. 2.03. Instead, he argued that the manner in which the relevant legislation was applied by the Disciplinary Council was unconstitutional because his comments were protected by s. 2(*b*) of the *Charter.*

[19] The Tribunal reviewed the constitutionality of the Disciplinary Council's decision on a standard of correctness, but said that a full *Oakes* analysis under s. 1 of the *Charter* was inappropriate where a decision only applied to one person. Instead, it held that "[t]he issue becomes one of proportionality or, more specifically, minimal limitation of the guaranteed right" (para. 69, citing *Multani v. Commission scolaire Marguerite-Bourgeoys*, 2006 SCC 6, [2006] 1 S.C.R. 256, at para. 155). In the circumstances, the Disciplinary Council's decision to sanction Mr. Doré was found to be a [TRANSLATION] "minimal restriction on freedom of expression" (para. 76). It rejected Mr. Doré's argument that Justice Boilard's disparaging remarks justified his letter. It also rejected his argument that the letter was private, since Mr. Doré remained "an officer of the court and a lawyer" (para. 77) and had exceeded the objectivity, moderation and

doivent collaborer entre eux dans les meilleurs intérêts de la justice. [par. 88]

En outre, le Comité a conclu que M^e^ Doré avait librement adhéré à une profession régie par un code de déontologie dont il savait qu'il limiterait sa liberté d'expression. Si ces règles peuvent « être perçu[e]s comme des restrictions imposées aux membres du Barreau en comparaison avec la liberté dont peuvent bénéficier les autres citoyens canadiens », il s'agit d'une « contrepartie aux privilèges qui sont accordés aux avocats qui sont membre[s] d'une "profession à exercice exclusif" » (par. 109-110). Le 24 juillet 2006, la même formation du Comité de discipline, estimant que le manquement de M^e^ Doré à son obligation était grave et qu'il n'avait exprimé aucun repentir, a prononcé la sanction qu'il lui infligeait, soit une suspension de son droit de pratique durant 21 jours (2006 CanLII 53436).

[18] M^e^ Doré a interjeté appel des décisions du Comité de discipline devant le Tribunal des professions, invoquant plusieurs moyens (2007 QCTP 152 (CanLII)). Cette fois, il n'a pas contesté la constitutionnalité de l'art. 2.03. Il a plutôt fait valoir que l'application des dispositions pertinentes par le Comité de discipline était inconstitutionnelle, puisque les commentaires qu'il avait formulés étaient protégés par l'al. 2*b*) de la *Charte.*

[19] Le Tribunal a examiné la constitutionnalité de la décision du Comité de discipline selon la norme de la décision correcte, mais il a précisé que l'application intégrale de l'analyse élaborée dans *Oakes* fondée sur l'article premier de la *Charte* ne convenait pas à l'égard des décisions applicables à une seule personne. Il a conclu que « [l]a question se réduit [plutôt] à un problème de proportionnalité ou, plus précisément, de restriction minimale du droit garanti » (par. 69, citant *Multani c. Commission scolaire Marguerite-Bourgeoys*, 2006 CSC 6, [2006] 1 R.C.S. 256, par. 155). Compte tenu des circonstances, le Tribunal a jugé que la décision du Comité d'imposer une mesure disciplinaire à M^e^ Doré constituait une « restriction minimale de la liberté d'expression » (par. 76). Il a écarté l'argument de M^e^ Doré selon lequel les remarques désobligeantes du juge Boilard justifiaient sa lettre. Il n'a pas non plus retenu l'argument du caractère

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dignity expected of him. Though it noted that the sanction imposed by the Disciplinary Council "seems harsh" (para. 135), the Tribunal held that it was not unreasonable, given the gravity of Mr. Doré's conduct and his lack of remorse.

[20] On judicial review, the Superior Court of Quebec upheld the decision of the Tribunal, including its view that the letter did not constitute a private act, and found the Tribunal's reasoning to be [TRANSLATION] "unassailable" (2008 QCCS 2450 (CanLII), at paras. 105, 109, 139 and 147). It concluded that by finding the decision to be a minimal restriction on Mr. Doré's freedom of expression, the Tribunal had "implicitly" held that the restriction was "justified in a free and democratic society" (para. 104).

[21] The Quebec Court of Appeal held that given the status and role of the parties, Mr. Doré could not reasonably have expected his letter to remain confidential or private. It acknowledged that the Disciplinary Council's decision was a breach of s. 2(*b*), but, applying a full s. 1 analysis, it found that Mr. Doré's letter had [TRANSLATION] "limited importance . . . compared to the values underlying freedom of expression, which are the pursuit of truth, participation in the community, individual self-fulfillment, and human flourishing" (para. 36). The court held that protecting the public was an important objective, and that the Disciplinary Council's decision had a rational connection with that objective, especially given the importance of a judge's position in the judicial system. On minimal impairment, assessing both the decision and the sanction, the Court of Appeal held that while the sanction was significant, it was targeted at the manner in which Mr. Doré criticized Justice Boilard, and did not prohibit the expression itself:

[TRANSLATION] The impugned decision appears to be measured and, in the present case, is a correct

privé de la lettre, estimant que M^e^ Doré n'avait pas cessé « d'être officier de justice et avocat » (par. 77) et qu'il n'avait pas fait preuve de l'objectivité, de la modération et de la dignité qu'on attendait de lui. Même s'il a jugé que la sanction infligée par le Comité de discipline était « sévère » (par. 135), le Tribunal a conclu qu'elle n'était pas déraisonnable compte tenu de la gravité de la conduite de M^e^ Doré et de son absence de repentir.

[20] À l'issue d'une révision judiciaire, la Cour supérieure du Québec a maintenu la décision du Tribunal, a notamment souscrit à l'opinion de ce dernier que la lettre ne constituait pas un acte privé et a conclu que le raisonnement du Tribunal était « sans reproche » (2008 QCCS 2450 (CanLII), par. 105, 109, 139 et 147). La Cour supérieure a jugé, en outre, qu'en concluant à l'existence d'une restriction minimale à la liberté d'expression de M^e^ Doré, le Tribunal avait « implicitement » statué que la restriction était « justifiée dans une société libre et démocratique » (par. 104).

[21] La Cour d'appel du Québec a jugé qu'en raison du statut et de la fonction des parties, M^e^ Doré ne pouvait raisonnablement s'attendre à ce que sa lettre demeure confidentielle ou privée. La Cour d'appel a toutefois reconnu que la décision du Comité de discipline contrevenait à l'al. 2*b*) mais, au terme d'une analyse complète fondée sur l'article premier, a conclu que la lettre de M^e^ Doré revêtait une « importance limitée [. . .] par rapport aux valeurs sous-jacentes à la liberté d'expression, soit la recherche de la vérité, la participation à la prise de décision d'intérêt social et politique, la diversité des formes d'enrichissement et d'épanouissement » (par. 36). Soulignant l'importance de l'objectif de protection du public, la Cour d'appel a considéré que la décision du Comité de discipline avait un lien rationnel avec cet objectif en raison, notamment, de la position importante du juge dans le système judiciaire. Concernant l'atteinte minimale, après examen de la décision et de la sanction, la Cour d'appel a statué que, bien que cette dernière fût sévère, elle visait la manière dont M^e^ Doré avait critiqué le juge Boilard, sans en interdire l'expression elle-même :

La décision attaquée me semble mesurée et constitue, en l'espèce, une application correcte de l'article 2.03

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application of section 2.03 of the *Code of ethics*. The sanction is significant (suspension of the right to practice for twenty-one days). It also involves the stigma attached to disciplinary guilt. It is not, however, unreasonable. In my view, it is a measured sanction of a lawyer who has been found guilty of a serious ethical offence. [para. 47]

It concluded by finding that the effects of the decision were proportionate to its objectives.

Analysis

[22] Mr. Doré's argument rests on his assertion that the finding of a breach of the *Code of ethics* violates the expressive rights protected by s. 2(*b*) of the *Charter*. Because the 21-day suspension had already been served when he was before the Court of Appeal, he did not appeal the penalty. The reasonableness of its length, therefore, is not before us.

[23] It is clear from the decisions of the Tribunal and the reviewing courts in this case that there is some confusion about the appropriate framework to be applied in reviewing administrative decisions for compliance with *Charter* values. Some courts have used the same s. 1 *Oakes* analysis used for determining whether a law complies with the *Charter*; others have used a classic judicial review approach.

[24] It goes without saying that administrative decision-makers must act consistently with the values underlying the grant of discretion, including *Charter* values (see *Chamberlain v. Surrey School District No. 36*, 2002 SCC 86, [2002] 4 S.C.R. 710, at para. 71; *Pinet v. St. Thomas Psychiatric Hospital*, 2004 SCC 21, [2004] 1 S.C.R. 528, at paras. 19-23; and *Ontario (Public Safety and Security) v. Criminal Lawyers' Association*, 2010 SCC 23, [2010] 1 S.C.R. 815, at paras. 62-75). The question then is what framework should be used to scrutinize how those values were applied?

[25] In *Slaight Communications Inc. v. Davidson*, [1989] 1 S.C.R. 1038, Lamer J., in his concurring

d[u] *Code de déontologie*. La sanction est importante (suspension du droit de pratique durant 21 jours). Elle comporte également le stigmate attaché à la culpabilité disciplinaire. Elle n'est toutefois pas déraisonnable. Elle m'apparaît empreinte de retenue à l'égard d'un avocat qui a commis une faute déontologique grave. [par. 47]

La Cour d'appel a conclu que la décision avait des effets proportionnels aux objectifs qu'elle visait.

Analyse

[22] M^e^ Doré fonde sa thèse sur sa prétention que le fait de conclure à une violation du *Code de déontologie* enfreint la liberté d'expression protégée par l'al. 2*b*) de la *Charte*. Puisque la radiation avait déjà pris fin lorsqu'il a été entendu par la Cour d'appel, M^e^ Doré n'a pas interjeté appel de la sanction. Nous n'avons donc pas à nous prononcer sur le caractère raisonnable de sa durée.

[23] Il ressort clairement des décisions du Tribunal et des cours qui ont procédé à la révision judiciaire en l'espèce qu'une certaine confusion entoure la question du cadre d'analyse applicable pour examiner la conformité des décisions administratives aux valeurs consacrées par la *Charte*. Certaines cours de justice ont eu recours au cadre d'analyse fondé sur l'article premier élaboré dans *Oakes*, qui sert à juger de la conformité des lois à la *Charte*, tandis que d'autres ont appliqué l'approche classique de la révision judiciaire.

[24] Il va sans dire que les décideurs administratifs doivent agir de manière compatible avec les valeurs sous-jacentes à l'octroi d'un pouvoir discrétionnaire, y compris les valeurs consacrées par la *Charte* (voir *Chamberlain c. Surrey School District No. 36*, 2002 CSC 86, [2002] 4 R.C.S. 710, par. 71; *Pinet c. St. Thomas Psychiatric Hospital*, 2004 CSC 21, [2004] 1 R.C.S. 528, par. 19-23; et *Ontario (Sûreté et Sécurité publique) c. Criminal Lawyers' Association*, 2010 CSC 23, [2010] 1 R.C.S. 815, par. 62-75). La question est donc celle de savoir quel cadre d'analyse il faut utiliser pour examiner l'application de ces valeurs.

[25] Dans l'arrêt *Slaight Communications Inc. c. Davidson*, [1989] 1 R.C.S. 1038, le juge Lamer a

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reasons, said that the *Charter* applied to a labour adjudicator's decision and used the s. 1 framework developed in *R. v. Oakes*, [1986] 1 S.C.R. 103, to determine if the decision complied with the *Charter.* Writing for the majority, Dickson C.J. agreed with Lamer J. that the *Charter* applied to administrative decision-making. But while he applied the *Oakes* framework, he notably and presciently observed that "[t]he precise relationship between the traditional standard of administrative law review of patent unreasonableness and the new constitutional standard of review will be worked out in future cases" (p. 1049 (emphasis added)).

[26] Yet the approach taken in *Slaight* can only be properly understood in its context. Importantly, when Lamer J. held that discretionary administrative decisions implicating *Charter* values should be reviewed under the *Oakes* analysis, he did so in the context of the perceived inability of administrative law to deal with *Charter* infringements in the exercise of discretion. This concern permeates the reasons in *Slaight*. As Prof. Geneviève Cartier has noted:

> . . . while Lamer J thought the administrative law standard was ill-suited to *Charter* challenges because of its inability to inquire into the substance of discretionary decisions, Dickson CJ thought it was ill-suited because of its inability to properly unravel the value inquiries involved in any *Charter* litigation.

("The *Baker* Effect: A New Interface Between the *Canadian Charter of Rights and Freedoms* and Administrative Law — The Case of Discretion", in David Dyzenhaus, ed., *The Unity of Public Law* (2004), 61, at p. 68)

[27] The approach taken in *Slaight* attracted academic concern from administrative law scholars.

affirmé, dans des motifs concordants, que la décision rendue par un arbitre du travail était assujettie à la *Charte*. Il s'est, en outre, servi du cadre d'analyse fondé sur l'article premier élaboré dans *Oakes* pour apprécier la conformité à la *Charte* de la sentence arbitrale en cause dans cette affaire. Au nom des juges majoritaires de la Cour, le juge en chef Dickson a jugé, comme le juge Lamer, que les décisions administratives étaient assujetties à la *Charte*. Cela étant dit, tout en recourant au cadre d'analyse établi dans *Oakes*, il a notamment souligné, faisant en cela preuve de prescience, que « [l]e rapport précis entre la norme traditionnelle de contrôle, en droit administratif, du caractère déraisonnable manifeste et la nouvelle norme constitutionnelle de contrôle va se dégager de la jurisprudence à venir » (p. 1049 (je souligne)).

[26] Or, l'approche adoptée dans *Slaight* ne peut être correctement interprétée que dans son contexte. Fait important, c'est devant ce qui semblait être l'incapacité du droit administratif de traiter des violations de la *Charte* dans l'exercice d'un pouvoir discrétionnaire que le juge Lamer a jugé que les décisions administratives de nature discrétionnaire, mettant en cause les valeurs consacrées par la *Charte*, devraient être révisées en appliquant le cadre d'analyse élaboré dans *Oakes*. Cette conclusion imprègne l'ensemble des motifs formulés dans *Slaight*. Comme la professeure Geneviève Cartier l'a souligné :

> [TRADUCTION] . . . bien que, selon le juge Lamer, la norme de droit administratif ne soit pas adaptée aux contestations fondées sur la *Charte*, parce qu'elle ne permet pas d'examiner à fond les décisions de nature discrétionnaire, le juge en chef Dickson a estimé qu'elle n'est pas adaptée parce qu'elle ne permet pas de décortiquer adéquatement l'examen des valeurs que comportent les litiges intéressant la *Charte*.

(« The *Baker* Effect : A New Interface Between the *Canadian Charter of Rights and Freedoms* and Administrative Law — The Case of Discretion », dans David Dyzenhaus, dir., *The Unity of Public Law* (2004), 61, p. 68)

[27] L'approche adoptée dans l'arrêt *Slaight* a suscité des préoccupations chez les universitaires

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Prof. John Evans argued that if courts were too quick to bypass administrative law in favour of the *Charter*, "a rich source of thought and experience about law and government will be overlooked or lost altogether" ("The Principles of Fundamental Justice: The Constitution and the Common Law" (1991), 29 *Osgoode Hall L.J.* 51, at p. 73). Similarly, Prof. Cartier suggested that the *Slaight* approach reduced the role of administrative law to the "formal determination of jurisdiction on the basis of statutory interpretation", which prevented the control of discretion with reference to "values" and presented "an impoverished picture of administrative law" (pp. 68-69).

[28] The scope of the review of discretionary administrative decisions that provided the backdrop for the decision in *Slaight* was altered by this Court's decision in *Baker v. Canada (Minister of Citizenship and Immigration)*, [1999] 2 S.C.R. 817, at para. 65. In that case, L'Heureux-Dubé J. concluded that administrative decision-makers were required to take into account fundamental Canadian values, including those in the *Charter*, when exercising their discretion (*Baker*, at paras. 53-56).

[29] Building on the decision in *Canadian Union of Public Employees, Local 963 v. New Brunswick Liquor Corp.*, [1979] 2 S.C.R. 227 ("*C.U.P.E.*"), *Baker* represented a further shift away from Diceyan principles. By recognizing that administrative decision-makers are both bound by fundamental values and empowered to adjudicate them, *Baker* ceded interpretive authority on those issues to those decision-makers (David Dyzenhaus and Evan Fox-Decent, "Rethinking the Process/Substance Distinction: *Baker* v. *Canada*" (2001), 51 *U.T.L.J.* 193, at p. 240). This allows the *Charter* to "nurture" administrative law, by emphasizing that *Charter* values infuse the inquiry (Cartier, at pp. 75 and 86; see also Mary Liston, "Governments in Miniature: The Rule of Law in the Administrative

spécialisés en droit administratif. Le professeur John Evans a soutenu que si les tribunaux étaient trop prompts à esquiver le droit administratif au profit d'analyses fondées sur la *Charte*, [TRADUCTION] « une source précieuse de connaissances et d'expériences en matière de droit et de gouvernance ne sera pas prise en compte ou sera complètement perdue » (« The Principles of Fundamental Justice : The Constitution and the Common Law » (1991), 29 *Osgoode Hall L.J.* 51, p. 73). Dans le même ordre d'idées, la professeure Cartier a affirmé que l'approche préconisée dans *Slaight* réduisait le rôle du droit administratif à [TRADUCTION] « déterminer la compétence de façon formelle en fonction de l'interprétation des lois », et que cela empêche la révision de l'exercice du pouvoir discrétionnaire en ce qui concerne les « valeurs » et donne « une image appauvrie du droit administratif » (p. 68-69).

[28] La portée de la révision des décisions administratives de nature discrétionnaire qui a servi de toile de fond à la décision rendue dans *Slaight* a été modifiée par la décision de la Cour dans l'affaire *Baker c. Canada (Ministre de la Citoyenneté et de l'Immigration)*, [1999] 2 R.C.S. 817, par. 65. Dans cet arrêt, la juge L'Heureux-Dubé a conclu que les décideurs administratifs devaient tenir compte des valeurs canadiennes fondamentales, notamment celles consacrées par la *Charte*, lorsqu'ils exercent leur pouvoir discrétionnaire (*Baker*, par. 53-56).

[29] Fort de la décision rendue dans *Syndicat canadien de la Fonction publique, section locale 963 c. Société des alcools du Nouveau-Brunswick*, [1979] 2 R.C.S. 227 (« *S.C.F.P.* »), l'arrêt *Baker* s'est davantage écarté des principes énoncés par Dicey. En reconnaissant que les décideurs administratifs sont à la fois liés par des valeurs fondamentales et habilités à statuer sur elles, *Baker* leur a cédé le pouvoir d'interprétation quant à ces questions (David Dyzenhaus et Evan Fox-Decent, « Rethinking the Process/Substance Distinction : *Baker* v. *Canada* » (2001), 51 *U.T.L.J.* 193, p. 240). La *Charte* peut ainsi [TRADUCTION] « favoriser le développement » du droit administratif en mettant l'accent pour que les valeurs qu'elle consacre infusent l'enquête (Cartier, p. 75 et 86;

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State", in Colleen M. Flood and Lorne Sossin, eds., *Administrative Law in Context* (2008), 77, at p. 100; Susan L. Gratton and Lorne Sossin, "In Search of Coherence: The *Charter* and Administrative Law under the McLachlin Court", in David A. Wright and Adam M. Dodek, eds., *Public Law at the McLachlin Court: The First Decade* (2011), 145, at pp. 157-58).

[30] When this is weighed together with this Court's subsequent decisions, we see a completely revised relationship between the *Charter*, the courts, and administrative law than the one first encountered in *Slaight*. In *Dunsmuir v. New Brunswick*, 2008 SCC 9, [2008] 1 S.C.R. 190, the Court held that judicial review should be guided by a policy of deference, justified on the basis of legislative intent, respect for the specialized expertise of administrative decision-makers, and recognition that courts do not have a monopoly on adjudication in the administrative state (para. 49). And in *R. v. Conway*, 2010 SCC 22, [2010] 1 S.C.R. 765, at paras. 78-82, building on the development of the jurisprudence, the Court found that administrative tribunals with the power to decide questions of law have the authority to apply the *Charter* and grant *Charter* remedies that are linked to matters properly before them.

[31] But, as predicted by Chief Justice Dickson, this Court has explored different ways to review the constitutionality of administrative decisions, vacillating between the values-based approach in *Baker* and the more formalistic template in *Slaight*. The s. 1 *Oakes* approach suggested by Lamer J., was followed in *Stoffman v. Vancouver General Hospital*, [1990] 3 S.C.R. 483; *Dagenais v. Canadian Broadcasting Corp.*, [1994] 3 S.C.R. 835; *Ross v. New Brunswick School District No. 15*, [1996] 1 S.C.R. 825; *Eldridge v. British Columbia (Attorney General)*, [1997] 3 S.C.R. 624; *Little Sisters Book and Art Emporium v. Canada (Minister of Justice)*, 2000 SCC 69, [2000] 2 S.C.R. 1120; *United States*

voir également Mary Liston, « Governments in Miniature : The Rule of Law in the Administrative State », dans Colleen M. Flood et Lorne Sossin, dir., *Administrative Law in Context* (2008), 77, p. 100; Susan L. Gratton et Lorne Sossin, « In Search of Coherence : The *Charter* and Administrative Law under the McLachlin Court », dans David A. Wright et Adam M. Dodek, dir., *Public Law at the McLachlin Court : The First Decade* (2011), 145, p. 157-58).

[30] Lorsque l'affirmation qui précède est appréciée au regard des décisions ultérieures de la Cour, nous entrevoyons une relation entre la *Charte*, les tribunaux et le droit administratif complètement différente de celle dont il a été question pour la première fois dans *Slaight*. Dans *Dunsmuir c. Nouveau-Brunswick*, 2008 CSC 9, [2008] 1 R.C.S. 190, la Cour a conclu que la révision judiciaire doit être orientée par une politique de retenue justifiée par le respect de la volonté du législateur, le respect de l'expertise spécialisée que possèdent les décideurs administratifs et la reconnaissance que les cours de justice n'ont pas le pouvoir exclusif de statuer sur toutes les questions dans le domaine administratif (par. 49). Dans *R. c. Conway*, 2010 CSC 22, [2010] 1 R.C.S. 765, par. 78-82, s'appuyant sur l'évolution de la jurisprudence, la Cour a conclu que les tribunaux administratifs dotés du pouvoir de trancher des questions de droit ont le pouvoir d'appliquer la *Charte* et d'accorder les réparations qu'autorise cette dernière dans les affaires dont ils sont régulièrement saisis.

[31] Cela étant dit, depuis, comme l'avait prédit le juge en chef Dickson, notre Cour a exploré différentes méthodes d'examen de la constitutionnalité des décisions administratives. Elle a oscillé entre, d'une part, l'approche fondée sur les valeurs préconisées dans *Baker* et, d'autre part, le modèle plus formaliste préconisé dans *Slaight*. L'approche proposée par le juge Lamer dans *Oakes* et fondée sur l'article premier a été suivie dans *Stoffman c. Vancouver General Hospital*, [1990] 3 R.C.S. 483, *Dagenais c. Société Radio-Canada*, [1994] 3 R.C.S. 835, *Ross c. Conseil scolaire du district nº 15 du Nouveau-Brunswick*, [1996] 1 R.C.S. 825, *Eldridge c. Colombie-Britannique (Procureur général)*,

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v. Burns, 2001 SCC 7, [2001] 1 S.C.R. 283; and *R. v. Mentuck*, 2001 SCC 76, [2001] 3 S.C.R. 442.

[32] Other cases, and particularly recently, have instead applied an administrative law/judicial review analysis in assessing whether the decision-maker took sufficient account of *Charter* values. This approach is seen in *Baker*; *Trinity Western University v. British Columbia College of Teachers*, 2001 SCC 31, [2001] 1 S.C.R. 772; *Chamberlain*; *Ahani v. Canada (Minister of Citizenship and Immigration)*, 2002 SCC 2, [2002] 1 S.C.R. 72; *Pinet*; *Lake v. Canada (Minister of Justice)*, 2008 SCC 23, [2008] 1 S.C.R. 761; *Canada (Prime Minister) v. Khadr*, 2010 SCC 3, [2010] 1 S.C.R. 44; *Criminal Lawyers' Association*; and *Németh v. Canada (Justice)*, 2010 SCC 56, [2010] 3 S.C.R. 281.

[33] The last decision of this Court to use the full s. 1 *Oakes* approach to determine whether the exercise of statutory discretion complied with the *Charter* was *Multani*. The academic commentary that followed was consistently critical. In brief, it generally argued that the use of a strict s. 1 analysis reduced administrative law to having a formal role in controlling the exercise of discretion (see Gratton and Sossin, at p. 157; David Mullan, "Administrative Tribunals and Judicial Review of *Charter* Issues after *Multani*" (2006), 21 *N.J.C.L.* 127; Stéphane Bernatchez, "Les rapports entre le droit administratif et les droits et libertés: la révision judiciaire ou le contrôle constitutionnel?" (2010), 55 *McGill L.J.* 641).

[34] Since then, and largely as a result of the revised administrative law template found in *Dunsmuir*, this Court appears to have moved away from *Multani*, leading to the suggestion that it may have "decided to start from ground zero in building coherence in public law" (Gratton and Sossin,

[1997] 3 R.C.S. 624, *Little Sisters Book and Art Emporium c. Canada (Ministre de la Justice)*, 2000 CSC 69, [2000] 2 R.C.S. 1120, *États-Unis c. Burns*, 2001 CSC 7, [2001] 1 R.C.S. 283 et *R. c. Mentuck*, 2001 CSC 76, [2001] 3 R.C.S. 442.

[32] Dans d'autres affaires, plus particulièrement des affaires récentes, c'est plutôt l'analyse droit administratif/révision judiciaire qui a été effectuée pour déterminer si le décideur a pris suffisamment compte des valeurs consacrées par la *Charte*. C'est cette approche qui a été privilégiée dans *Baker*, *Université Trinity Western c. British Columbia College of Teachers*, 2001 CSC 31, [2001] 1 R.C.S. 772, *Chamberlain*; *Ahani c. Canada (Ministre de la Citoyenneté et de l'Immigration)*, 2002 CSC 2, [2002] 1 R.C.S. 72, *Pinet*; *Lake c. Canada (Ministre de la Justice)*, 2008 CSC 23, [2008] 1 R.C.S. 761, *Canada (Premier ministre) c. Khadr*, 2010 CSC 3, [2010] 1 R.C.S. 44, *Criminal Lawyers' Association*, et *Németh c. Canada (Justice)*, 2010 CSC 56, [2010] 3 R.C.S. 281.

[33] C'est dans *Multani* que notre Cour a utilisé pour la dernière fois l'analyse intégrale fondée sur l'article premier élaborée dans *Oakes* pour juger de la conformité à la *Charte* de l'exercice d'un pouvoir discrétionnaire conféré par la loi. La doctrine qui a suivi a été uniformément critique. En somme, les auteurs, pour la plupart, ont fait valoir que le recours à une analyse fondée strictement sur l'art. 1 réduisait le droit administratif à un rôle formel dans le contexte de la révision de l'exercice du pouvoir discrétionnaire (voir Gratton et Sossin, p. 157; David Mullan, « Administrative Tribunals and Judicial Review of *Charter* Issues after *Multani* » (2006), 21 *R.N.D.C.* 127; Stéphane Bernatchez, « Les rapports entre le droit administratif et les droits et libertés : la révision judiciaire ou le contrôle constitutionnel? » (2010), 55 *R.D. McGill* 641).

[34] Depuis le prononcé de cet arrêt, et en grande partie à cause de la révision du modèle d'analyse des décisions administratives opérée par *Dunsmuir*, notre Cour semble s'être écartée de *Multani*, ce qui laisse croire qu'elle a peut-être [TRADUCTION] « décidé de faire table rase avant d'établir une

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at p. 161). Today, the Court has two options for reviewing discretionary administrative decisions that implicate *Charter* values. The first is to adopt the *Oakes* framework, developed for reviewing laws for compliance with the Constitution. This undoubtedly protects *Charter* rights, but it does so at the risk of undermining a more robust conception of administrative law. In the words of Prof. Evans, if administrative law is bypassed for the *Charter*, "a rich source of thought and experience about law and government will be overlooked" (p. 73).

[35] The alternative is for the Court to embrace a richer conception of administrative law, under which discretion is exercised "in light of constitutional guarantees and the values they reflect" (*Multani*, at para. 152, *per* LeBel J.). Under this approach, it is unnecessary to retreat to a s. 1 *Oakes* analysis in order to protect *Charter* values. Rather, administrative decisions are *always* required to consider fundamental values. The *Charter* simply acts as "a reminder that some values are clearly fundamental and . . . cannot be violated lightly" (Cartier, at p. 86). The administrative law approach also recognizes the legitimacy that this Court has given to administrative decision-making in cases such as *Dunsmuir* and *Conway*. These cases emphasize that administrative bodies are empowered, and indeed required, to consider *Charter* values within their scope of expertise. Integrating *Charter* values into the administrative approach, and recognizing the expertise of these decision-makers, opens "an institutional dialogue about the appropriate use and control of discretion, rather than the older command-and-control relationship" (Liston, at p. 100).

nouvelle cohérence en droit public » (Gratton et Sossin, p. 161). Aujourd'hui, la Cour a deux options quant à la révision des décisions administratives de nature discrétionnaire qui soulèvent des questions relatives aux valeurs consacrées par la *Charte*. La première consiste à adopter le cadre d'analyse décrit dans *Oakes* et élaboré pour examiner la constitutionnalité des lois. Cette approche protège indéniablement les droits visés par la *Charte*, mais elle le fait au détriment d'une conception plus riche du droit administratif. Comme l'exprime le professeur Evans, si les tribunaux étaient trop prompts à esquiver le droit administratif au profit de la *Charte*, [TRADUCTION] « une source précieuse de connaissances et d'expériences en matière de droit et de gouvernance ne sera pas prise en compte ou sera complètement perdue » (p. 73).

[35] En choisissant plutôt la seconde option, la Cour donnerait son aval à cette conception plus riche du droit administratif en vertu de laquelle le pouvoir discrétionnaire est exercé « à l'aune des garanties constitutionnelles et des valeurs que comportent celles-ci » (*Multani*, par. 152, le juge LeBel). Cette approche n'exige pas de se rabattre sur l'analyse requise par l'article premier telle qu'elle a été établie dans *Oakes* pour protéger les valeurs consacrées par la *Charte*; elle suppose plutôt que les décisions administratives prennent *toujours* en considération les valeurs fondamentales. La *Charte* n'agit alors que comme [TRADUCTION] « un rappel que certaines valeurs sont manifestement fondamentales et [. . .] ne peuvent être violées à la légère » (Cartier, p. 86). L'approche du droit administratif reconnaît, en outre, la légitimité que la Cour a donnée à la prise de décisions administratives dans des arrêts tels *Dunsmuir* et *Conway*. Ces derniers soulignent que les organismes administratifs ont le pouvoir, et même le devoir, de tenir compte des valeurs consacrées par la *Charte* dans leur domaine d'expertise. Intégrer ces valeurs dans l'approche qui préconise l'application des règles de droit administratif et reconnaître l'expertise des décideurs administratifs instaure [TRADUCTION] « un dialogue institutionnel quant à l'utilisation qui doit être faite du pouvoir discrétionnaire et quant à la révision appropriée de son exercice plutôt que de faire appel à la relation plus ancienne d'autorité et de contrôle » (Liston, p. 100).

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[36] As explained by Chief Justice McLachlin in *Alberta v. Hutterian Brethren of Wilson Colony*, 2009 SCC 37, [2009] 2 S.C.R. 567, the approach used when reviewing the constitutionality of a law should be distinguished from the approach used for reviewing an administrative decision that is said to violate the rights of a particular individual (see also Bernatchez). When *Charter* values are applied to an individual administrative decision, they are being applied in relation to a particular set of facts. *Dunsmuir* tells us this should attract deference (para. 53; see also *Suresh v. Canada (Minister of Citizenship and Immigration)*, 2002 SCC 1, [2002] 1 S.C.R. 3, at para. 39). When a particular "law" is being assessed for *Charter* compliance, on the other hand, we are dealing with principles of general application.

[37] The more flexible administrative approach to balancing *Charter* values is also more consistent with the nature of discretionary decision-making. Some of the aspects of the *Oakes* test are, in any event, poorly suited to the review of discretionary decisions, whether of judges or administrative decision-makers. For instance, the requirement under s. 1 that a limit be "prescribed by law" has been held by this Court to apply to norms where "their adoption is authorized by statute, they are binding rules of general application, and they are sufficiently accessible and precise to those to whom they apply" (*Greater Vancouver Transportation Authority v. Canadian Federation of Students — British Columbia Component*, 2009 SCC 31, [2009] 2 S.C.R. 295, at para. 53).

[38] Moreover, when exercising discretion under a provision or statutory scheme whose constitutionality is not impugned, it is conceptually difficult to see what the "pressing and substantial" objective of a decision is, or who would have the burden of defining and defending it.

[36] Comme la juge en chef McLachlin l'a expliqué dans *Alberta c. Hutterian Brethren of Wilson Colony*, 2009 CSC 37, [2009] 2 R.C.S. 567, l'examen de la constitutionnalité d'une loi doit être différent de la révision d'une décision administrative qui est contestée parce qu'elle porterait atteinte aux droits d'un individu en particulier (voir également Bernatchez). Lorsque les valeurs consacrées par la *Charte* sont appliquées à une décision administrative particulière, elles sont appliquées relativement à un ensemble précis de faits. *Dunsmuir* nous dit que la retenue s'impose dans un tel cas (par. 53; voir aussi *Suresh c. Canada (Ministre de la Citoyenneté et de l'Immigration)*, 2002 CSC 1, [2002] 1 R.C.S. 3, par. 39). Par contre, lorsqu'on vérifie si une « loi » particulière respecte la *Charte*, il est question de principes d'application générale.

[37] L'approche plus souple du droit administratif pour mettre en balance les valeurs consacrées par la *Charte* est également plus compatible avec la nature de la prise de décision qui découle de l'exercice d'un pouvoir discrétionnaire. Quoi qu'il en soit, certains aspects du test élaboré dans *Oakes* conviennent peu à la révision des décisions prises à la suite de l'exercice d'un pouvoir discrétionnaire, qu'elles aient été prises par des juges ou par des décideurs administratifs. Par exemple, la Cour a jugé que l'exigence de l'article premier selon laquelle la restriction doit découler de l'application d'une « règle de droit » s'applique à des normes dont l'« adoption est autorisée par une loi, [des normes, en outre,] obligatoires et d'application générale et [. . .] suffisamment accessibles et précis[es] pour ceux qui y sont assujettis. » (*Greater Vancouver Transportation Authority c. Fédération canadienne des étudiantes et étudiants — Section Colombie-Britannique*, 2009 CSC 31, [2009] 2 R.C.S. 295, par. 53).

[38] En outre, lorsqu'un décideur exerce le pouvoir discrétionnaire que lui confère une disposition législative ou un régime légal dont la constitutionnalité n'est pas contestée, il est difficile, d'un point de vue conceptuel, d'imaginer ce qui pourrait constituer l'objectif « urgent et réel » d'une décision ou de savoir qui devrait assumer le fardeau de le définir et de le défendre.

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[39] This Court has already recognized the difficulty of applying the *Oakes* framework beyond the context of reviewing a law or other rule of general application. This has been the case in applying *Charter* values to the common law, "where there is no specific enactment that can be examined in terms of objective, rational connection, least drastic means and proportionate effect" (Peter W. Hogg, *Constitutional Law of Canada* (5th ed. Supp.), vol. 2, at section 38.15). In *R. v. Daviault*, [1994] 3 S.C.R. 63, for example, in assessing the common law rule relating to establishing intent under extreme intoxication, the Court held that no *Oakes* analysis was required when reviewing a common law rule for compliance with *Charter* values:

> If a new common law rule could be enunciated which would not interfere with an accused person's right to have control over the conduct of his or her defence, I can see no conceptual problem with the Court's simply enunciating such a rule to take the place of the old rule, without considering whether the old rule could nonetheless be upheld under s. 1 of the *Charter.* Given that the common law rule was fashioned by judges and not by Parliament or a legislature, judicial deference to elected bodies is not an issue. If it is possible to reformulate a common law rule so that it will not conflict with the principles of fundamental justice, such a reformulation should be undertaken. [pp. 93-94, citing *R. v. Swain*, [1991] 1 S.C.R. 933, at p. 978.]

[40] In *Hill v. Church of Scientology of Toronto*, [1995] 2 S.C.R. 1130, this Court explicitly rejected the use of the s. 1 *Oakes* framework in developing the common law of defamation for two reasons. First, when interpreting a common law rule, there is no violation of a *Charter* right, but a conflict between principles, so "the balancing must be more flexible than the traditional s. 1 analysis", with *Charter* values providing the guidelines for any modification to the common law (para. 97). Second, the Court noted that "the division of onus which normally operates in a *Charter* challenge" was not appropriate for private litigation under the common law, as the party seeking to change the

[39] La Cour a déjà reconnu la difficulté que pose l'application du cadre d'analyse formulé dans *Oakes* au-delà du contexte de la révision d'une loi ou d'un autre type de règles de droit d'application générale. Le défi s'est posé lorsqu'il s'est agi d'appliquer les valeurs protégées par la *Charte* à la common law [TRADUCTION] « qui ne recèle aucun texte réglementaire qui puisse être examiné en terme d'objectif, de lien rationnel, d'atteinte minimale et d'effet proportionnel » (Peter W. Hogg, *Constitutional Law of Canada* (5e éd. suppl.), vol. 2, par. 38.15). Dans *R. c. Daviault*, [1994] 3 R.C.S. 63, par exemple, la Cour devait évaluer la règle de common law relative à l'établissement de l'existence de l'intention dans le cas d'une intoxication extrême. Elle a conclu qu'il n'était pas nécessaire de procéder à l'analyse prescrite par *Oakes* dans le contexte de la révision d'une règle de common law pour s'assurer de sa conformité aux valeurs consacrées par la *Charte* :

> S'il est possible d'énoncer une nouvelle règle de common law qui ne contrevienne pas au droit de l'accusé de contrôler la conduite de sa défense, je n'ai aucune difficulté à imaginer que la Cour puisse simplement la formuler, en remplacement de l'ancienne, sans chercher à savoir si l'ancienne règle pourrait néanmoins être maintenue en vertu de l'article premier de la *Charte*. Vu que la règle de common law a été créée par des juges et non par le législateur, l'égard que les tribunaux doivent avoir envers les organismes élus n'est pas en cause. S'il est possible de reformuler une règle de common law de façon qu'elle ne s'oppose pas aux principes de justice fondamentale, il faudrait le faire. [p. 93-94, citant *R. c. Swain*, [1991] 1 R.C.S. 933, p. 978.]

[40] Dans *Hill c. Église de scientologie de Toronto*, [1995] 2 R.C.S. 1130, la Cour a explicitement rejeté, pour deux raisons, l'utilisation du cadre d'analyse formulé dans *Oakes* lorsqu'il s'est agi d'élaborer la common law en matière de diffamation. Premièrement, quand il est question d'interpréter une règle de common law, il n'y a pas de violation d'un droit visé par la *Charte*, mais plutôt un conflit entre deux principes, de sorte que, d'une part, « la pondération doit être plus souple que l'analyse traditionnelle effectuée en vertu de l'article premier » et que, d'autre part, les valeurs consacrées par la *Charte* offrent alors des lignes directrices quant à toute modification de la common law

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common law should not be allowed to benefit from a reverse onus (para. 98). As a result, the Court went on to "consider the common law of defamation in light of the values underlying the *Charter*" (para. 99). And in *Grant v. Torstar Corp.*, 2009 SCC 61, [2009] 3 S.C.R. 640, the Court relied on *Charter* values in introducing the new defence of responsible communication on matters of public interest to the law of defamation, without engaging in an *Oakes* analysis.

[41] A further example is found in *R.W.D.S.U., Local 558 v. Pepsi-Cola Canada Beverages (West) Ltd.*, 2002 SCC 8, [2002] 1 S.C.R. 156, where the Court dealt with the common law of secondary picketing. After concluding that freedom of expression was engaged, the Court did not embark on an *Oakes* analysis. Instead, it found that the appropriate question was "which approach [to regulating secondary picketing] best balances the interests at stake in a way that conforms to the fundamental values reflected in the *Charter*?" (para. 65).

[42] Though each of these cases engaged *Charter* values, the Court did not see the *Oakes* test as the vehicle for balancing whether those values were taken into sufficient account. The same is true, it seems to me, in the administrative law context, where decision-makers are called upon to exercise their statutory discretion in accordance with *Charter* protections.

[43] What is the impact of this approach on the standard of review that applies when assessing the compliance of an administrative decision with *Charter* values? There is no doubt that when a tribunal is determining the constitutionality of a law,

(par. 97). Deuxièmement, la Cour a souligné que « le partage habituel du fardeau dans [une] contestation [. . .] fondée sur la *Charte* » ne convenait pas pour un litige privé en common law puisque la partie qui cherche à faire modifier la common law ne devrait pas pouvoir profiter d'un renversement du fardeau de la preuve (par. 98). La Cour a donc examiné « la common law de la diffamation à la lumière des valeurs de la *Charte* » (par. 99). De plus, dans *Grant c. Torstar Corp.*, 2009 CSC 61, [2009] 3 R.C.S. 640, la Cour s'est fondée sur les valeurs consacrées par la *Charte* pour introduire dans le droit relatif à la diffamation le nouveau moyen de défense de communication responsable concernant des questions d'intérêt public, et ce, sans faire intervenir l'analyse élaborée dans *Oakes*.

[41] L'arrêt *S.D.G.M.R., section locale 558 c. Pepsi-Cola Canada Beverages (West) Ltd.*, 2002 CSC 8, [2002] 1 R.C.S. 156, est un autre exemple de décision allant en ce sens. Il s'agit de l'affaire où la Cour a traité de la notion de common law de piquetage secondaire. Or, après avoir conclu que la liberté d'expression était en jeu, elle n'a pas procédé à l'analyse décrite dans *Oakes*. Elle a plutôt conclu que la question qu'il fallait se poser était celle de savoir quelle est « l'approche [pour régir le piquetage secondaire] qui pondère le mieux les intérêts en jeu, d'une façon conforme aux valeurs fondamentales reflétées dans la *Charte* » (par. 65).

[42] Ainsi, même si toutes ces causes mettaient en jeu des valeurs consacrées par la *Charte*, la Cour n'a pas jugé bon d'utiliser le test élaboré dans *Oakes* pour décider si ces valeurs avaient été suffisamment prises en compte. Il en va de même, à mon avis, dans le contexte du droit administratif, où les décideurs sont appelés à exercer le pouvoir discrétionnaire que leur confère la loi en s'assurant de protéger les droits visés par la *Charte*.

[43] Quel est l'effet de cette approche sur la norme de révision applicable à l'appréciation de la conformité d'une décision administrative aux valeurs consacrées par la *Charte*? Il ne fait aucun doute que la décision d'un tribunal administratif au sujet

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the standard of review is correctness (*Dunsmuir*, at para. 58). It is not at all clear to me, however, based on this Court's jurisprudence, that correctness should be used to determine whether an administrative decision-maker has taken sufficient account of *Charter* values in making a discretionary decision.

[44] This Court elaborated on the applicable standard of review to legal disciplinary panels in the pre-*Dunsmuir* decision of *Law Society of New Brunswick v. Ryan*, 2003 SCC 20, [2003] 1 S.C.R. 247, where Iacobucci J. adopted a reasonableness standard in reviewing a sanction imposed for professional misconduct:

> Although there is a statutory appeal from decisions of the Discipline Committee, the expertise of the Committee, the purpose of its enabling statute, and the nature of the question in dispute all suggest a more deferential standard of review than correctness. These factors suggest that the legislator intended that the Discipline Committee of the self-regulating Law Society should be a specialized body with the primary responsibility to promote the objectives of the Act by overseeing professional discipline and, where necessary, selecting appropriate sanctions. In looking at all the factors as discussed in the foregoing analysis, I conclude that the appropriate standard is reasonableness *simpliciter*. Thus, on the question of the appropriate sanction for professional misconduct, the Court of Appeal should not substitute its own view of the "correct" answer but may intervene only if the decision is shown to be unreasonable. [Emphasis added; para. 42.]

[45] It seems to me that applying the *Dunsmuir* principles results in reasonableness remaining the applicable review standard for disciplinary panels. The issue then is whether this standard should be different when what is assessed is the disciplinary body's application of *Charter* protections in the exercise of its discretion. In my view, the fact that *Charter* interests are implicated does not argue for a different standard.

de la constitutionnalité d'une loi s'examine suivant la norme de la décision correcte (*Dunsmuir*, par. 58). Cela étant dit, compte tenu de la jurisprudence de la Cour, il n'est pas du tout clair, selon moi, que c'est cette norme qu'il faut appliquer pour déterminer si un décideur administratif a suffisamment tenu compte des valeurs consacrées par la *Charte* en rendant une décision à la suite de l'exercice d'un pouvoir discrétionnaire.

[44] La Cour a approfondi la question de la norme de contrôle applicable aux décisions d'organismes disciplinaires dans l'arrêt *Barreau du Nouveau-Brunswick c. Ryan*, 2003 CSC 20, [2003] 1 R.C.S. 247, antérieur à *Dunsmuir*, et le juge Iacobucci y a retenu la norme de la décision raisonnable pour l'examen de la sanction infligée à l'égard d'une faute professionnelle :

> Bien que la loi prévoie un droit d'appel des décisions du comité de discipline, l'expertise du comité, l'objet de sa loi habilitante et la nature de la question en litige militent tous en faveur d'un degré plus élevé de déférence que la norme de la décision correcte. Ces facteurs indiquent que le législateur voulait que le comité de discipline du barreau autonome soit un organisme spécialisé ayant comme responsabilité primordiale la promotion des objectifs de la Loi par la surveillance disciplinaire de la profession et, au besoin, le choix de sanctions appropriées. Compte tenu de l'ensemble des facteurs pris en compte dans l'analyse qui précède, je conclus que la norme appropriée est celle de la décision raisonnable *simpliciter*. Par conséquent, sur la question de la sanction appropriée pour le manquement professionnel, la Cour d'appel ne devrait pas substituer sa propre opinion quant à la réponse « correcte » et ne peut intervenir que s'il est démontré que la décision est déraisonnable. [Je souligne; par. 42.]

[45] Je suis d'avis que, si on applique les principes établis dans *Dunsmuir*, la norme de la décision raisonnable reste celle à laquelle il faut recourir pour réviser les décisions des comités de discipline. Il s'agit donc de se demander si c'est une norme différente dont les tribunaux doivent se servir lorsque l'analyse porte sur l'application par l'organisme disciplinaire des garanties visées par la *Charte* dans l'exercice du pouvoir discrétionnaire qui lui est conféré. À mon avis, il n'y a pas lieu d'appliquer une norme différente du fait que la *Charte* est en cause.

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[46] The starting point is the expertise of the tribunals in connection with their home statutes. Citing Prof. David Mullan, *Dunsmuir* confirmed the importance of recognizing that

> those working day to day in the implementation of frequently complex administrative schemes have or will develop a considerable degree of expertise or field sensitivity to the imperatives and nuances of the legislative regime . . . .

(para. 49, citing "Establishing the Standard of Review: The Struggle for Complexity?" (2004), 17 *C.J.A.L.P.* 59, at p. 93.)

And, as Prof. Evans has noted, the "reasons for judicial restraint in reviewing agencies' decisions on matters in which their expertise is relevant do not lose their cogency simply because the question in issue also has a constitutional dimension" (p. 81).

[47] An administrative decision-maker exercising a discretionary power under his or her home statute, has, by virtue of expertise and specialization, particular familiarity with the competing considerations at play in weighing *Charter* values. As the Court explained in *Douglas/Kwantlen Faculty Assn. v. Douglas College*, [1990] 3 S.C.R. 570, adopting the observations of Prof. Danielle Pinard:

> [TRANSLATION] . . . administrative tribunals have the skills, expertise and knowledge in a particular area which can with advantage be used to ensure the primacy of the Constitution. Their privileged situation as regards the appreciation of the relevant facts enables them to develop a functional approach to rights and freedoms as well as to general constitutional precepts.

(p. 605, citing "Le pouvoir des tribunaux administratifs québécois de refuser de donner effet à des textes qu'ils jugent inconstitutionnels" (1987-88), *McGill L.J.* 170, at pp. 173-74.)

[48] This case, among others, reflected the increasing recognition by this Court of the distinct advantage that administrative bodies have in applying the *Charter* to a specific set of facts and in the

[46] Le premier point à considérer est l'expertise des tribunaux administratifs concernant leur loi constitutive. L'arrêt *Dunsmuir*, citant le professeur David Mullan, a confirmé qu'il importait de reconnaître que

> [TRADUCTION] les personnes qui se consacrent quotidiennement à l'application de régimes administratifs souvent complexes possèdent ou acquièrent une grande connaissance ou sensibilité à l'égard des impératifs et des subtilités des régimes législatifs en cause . . .

(par. 49, citant « Establishing the Standard of Review: The Struggle for Complexity? » (2004), 17 *C.J.A.L.P.* 59, p. 93.)

Comme le professeur Evans l'a souligné, les [TRADUCTION] « motifs invoqués pour faire montre de retenue dans le cadre de l'examen des décisions d'organismes relatives à leur champ d'expertise ne perdent pas leur bien-fondé du seul fait que la question en litige comporte également une dimension constitutionnelle » (p. 81).

[47] Le décideur administratif exerçant un pouvoir discrétionnaire en vertu de sa loi constitutive est, de par son expertise et sa spécialisation, particulièrement au fait des considérations opposées en jeu dans la mise en balance des valeurs consacrées par la *Charte*. Comme la Cour l'a expliqué en faisant siens les commentaires de la professeure Danielle Pinard dans *Douglas/Kwantlen Faculty Assn. c. Douglas College*, [1990] 3 R.C.S. 570 :

> . . . les tribunaux administratifs possèdent une compétence, une expertise et une connaissance d'un milieu particulier qu'ils pourraient avantageusement mettre au service de la mise en œuvre de la primauté de la Constitution. Leur position privilégiée quant à l'appréhension des faits pertinents leur permet d'élaborer une approche fonctionnelle des droits et libertés tout comme des préceptes constitutionnels généraux.

(p. 605, citant « Le pouvoir des tribunaux administratifs québécois de refuser de donner effet à des textes qu'ils jugent inconstitutionnels » (1987-88), *R.D. McGill* 170, p. 173-74.)

[48] Cette cause, entre autres, a illustré que la Cour reconnaît de plus en plus la position privilégiée qu'occupent les tribunaux administratifs en matière d'application de la *Charte* à un ensemble

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context of their enabling legislation (see *Conway*, at paras. 79-80). As Major J. noted in dissent in *Mooring v. Canada (National Parole Board)*, [1996] 1 S.C.R. 75, tailoring the *Charter* to a specific situation "is more suited to a tribunal's special role in determining rights on a case by case basis in the tribunal's area of expertise" (para. 64; see also *C.U.P.E.*, at pp. 235-36).

[49] These principles led the Court to apply a reasonableness standard in *Chamberlain*, where McLachlin C.J. found that a school board had acted unreasonably in refusing to approve the use of books depicting same-sex parented families. She held that the board had failed to respect the "values of accommodation, tolerance and respect for diversity" which were incorporated into its enabling legislation and "reflected in our Constitution's commitment to equality and minority rights" (para. 21). Similarly, in *Pinet*, Binnie J. used a reasonableness standard to review, for compliance with s. 7 of the *Charter*, a decision of the Ontario Review Board to return the appellant to a maximum security hospital, observing that a reasonableness review best reflected "the expertise of the members appointed to Review Boards" (para. 22). The purpose of the exercise was to determine whether the decision was "the least onerous and least restrictive" of the liberty interests of the appellant while considering "public safety, the mental condition and other needs of the individual concerned, and his or her potential reintegration into society" (paras. 19 and 23). In *Pinet*, the test was laid out in the statute, but Binnie J. made it clear that the emphasis on the least infringing decision was a constitutional requirement.

[50] In *Lake*, where the Court was reviewing the Minister's decision to surrender a Canadian citizen for extradition, implicating ss. 6(1) and 7 of the *Charter*, the Court again applied a reasonableness standard. LeBel J. held that deference is owed to the Minister's decision, as the Minister is closer

particulier de faits dans le contexte de leur loi habilitante (voir *Conway*, par. 79-80). Comme le juge Major l'a signalé dans les motifs dissidents qu'il a signés dans *Mooring c. Canada (Commission nationale des libérations conditionnelles)*, [1996] 1 R.C.S. 75, leur « fonction particulière de détermination des droits au cas par cas dans leur domaine de spécialisation placerait même plutôt les tribunaux administratifs en meilleure position » pour appliquer la *Charte* à une situation donnée (par. 64; voir aussi *S.C.F.P.*, p. 235-236).

[49] Ces principes ont amené la Cour à appliquer la norme de la décision raisonnable dans *Chamberlain*, où la juge en chef McLachlin a conclu que le refus d'un conseil scolaire d'approuver l'utilisation de manuels présentant des familles homoparentales était déraisonnable. Elle a jugé que le conseil n'avait pas respecté les « valeurs d'accommodement, de tolérance et de respect de la diversité » qui sont incorporées dans sa loi habilitante et qui « se traduisent par la protection constitutionnelle du droit à l'égalité et des droits des minorités » (par. 21). De même, dans *Pinet*, le juge Binnie a appliqué la norme de la décision raisonnable à l'examen de la conformité à l'art. 7 de la *Charte* de la décision de la Commission ontarienne d'examen de renvoyer l'appelant dans un hôpital à sécurité maximum, en signalant que c'est cette norme qui tient le mieux compte de « l'expertise des membres des commissions d'examen » (par. 22). Il s'agissait de juger si la décision était « [la] moins sévèr[e] et [la] moins privativ[e] » pour la liberté de l'appelant tout en tenant compte de « la sécurité du public, de l'état mental de l'individu en cause et de ses besoins, notamment sa réinsertion sociale éventuelle » (par. 19 et 23). Dans cette affaire, le critère était énoncé dans la loi, mais le juge Binnie a exposé clairement que la recherche de la décision la moins attentatoire était une exigence constitutionnelle.

[50] L'affaire *Lake* portait sur la révision d'une décision ministérielle d'extradition visant un citoyen canadien et faisant intervenir le par. 6(1) et l'art. 7 de la *Charte*. Là encore, la Cour a appliqué la norme de la décision raisonnable. Le juge LeBel a déclaré qu'il y a lieu, en raison de l'expertise du

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to the relevant facts required to balance competing considerations and benefits from expertise:

This Court has repeatedly affirmed that deference is owed to the Minister's decision whether to order surrender once a fugitive has been committed for extradition. The issue in the case at bar concerns the standard to be applied in reviewing the Minister's assessment of a fugitive's *Charter* rights. Reasonableness is the appropriate standard of review for the Minister's decision, regardless of whether the fugitive argues that extradition would infringe his or her rights under the *Charter*. As is evident from this Court's jurisprudence, to ensure compliance with the *Charter* in the extradition context, the Minister must balance competing considerations, and where many such considerations are concerned, the Minister has superior expertise. The assertion that interference with the Minister's decision will be limited to exceptional cases of "real substance" reflects the breadth of the Minister's discretion; the decision should not be interfered with unless it is unreasonable (*Schmidt* [*Canada v. Schmidt*, [1987] 1 S.C.R. 500]) (for comments on the standards of correctness and reasonableness, see *Dunsmuir v. New Brunswick*, [2008] 1 S.C.R. 190, 2008 SCC 9). [Emphasis added; para. 34.]

[51] The alternative — adopting a correctness review in every case that implicates *Charter* values — will, as Prof. Mullan noted, essentially lead to courts "retrying" a range of administrative decisions that would otherwise be subjected to a reasonableness standard:

If correctness review becomes the order of the day in all *Charter* contexts, including the determination of factual issues and the application of the law to those facts, then what in effect can occur is that the courts will perforce assume the role of a *de novo* appellate body from all tribunals the task of which is to make decisions that of necessity have an impact on *Charter* rights and freedoms: Review Boards, Parole Boards, prison disciplinary tribunals, child welfare authorities, and the like. Whether that kind of judicial micro-managing of aspects of the administrative process should take place is a highly problematic question. [Emphasis added; p. 145.]

ministre et de sa proximité avec les faits pertinents, de déférer aux décisions de ce dernier pour la mise en balance des considérations opposées en jeu :

Notre Cour a confirmé à maintes reprises que la déférence s'imposait à l'endroit de la décision du ministre de prendre ou non un arrêté d'extradition une fois le fugitif incarcéré. Elle doit aujourd'hui déterminer quelle norme de contrôle judiciaire s'applique à l'appréciation ministérielle des droits constitutionnels du fugitif. Cette norme demeure celle de la raisonnabilité, même lorsque le fugitif fait valoir que l'extradition porterait atteinte à ses droits constitutionnels. Il ressort de la jurisprudence de notre Cour que pour assurer le respect de la *Charte* dans le contexte d'une demande d'extradition, le ministre doit tenir compte de considérations opposées et possède à l'égard de bon nombre de celles-ci une plus grande expertise. L'affirmation selon laquelle les tribunaux n'interviendront que dans les cas exceptionnels où cela « s'impose réellement » traduit bien la portée du pouvoir discrétionnaire du ministre. La décision ne doit en effet être modifiée que si elle est déraisonnable (*Schmidt* [*Canada c. Schmidt*, [1987] 1 R.C.S. 500]) (voir l'analyse de la norme de la décision correcte et de la norme de la décision raisonnable dans l'arrêt *Dunsmuir c. Nouveau-Brunswick*, [2008] 1 R.C.S. 190, 2008 CSC 9. [Je souligne; par. 34.]

[51] Comme le signale le professeur Mullan, l'autre solution — soit celle qui consiste à appliquer la norme de la décision correcte chaque fois que des valeurs consacrées par la *Charte* sont en cause — aurait essentiellement pour effet que des décisions administratives qui auraient autrement été révisées suivant la norme de la décision raisonnable seraient « jugées à nouveau » :

[TRADUCTION] Si tous les contextes relatifs à la *Charte* devaient commander l'examen de la justesse de la décision, même en ce qui concerne les questions de fait et l'application du droit aux conclusions de fait, cela pourrait avoir pour effet de conférer aux tribunaux judiciaires le rôle de cours d'appel *de novo* à l'égard de tous les tribunaux administratifs appelés à rendre des décisions qui toucheront immanquablement des droits ou libertés garantis par la *Charte*, tels les commissions de révision ou de libération conditionnelle, les comités de discipline de pénitenciers, les autorités de protection de l'enfance, etc. L'opportunité d'un tel interventionnisme judiciaire dans ces divers aspects du processus administratif est une question très délicate. [Je souligne; p. 145.]

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[52] So our choice is between saying that every time a party argues that *Charter* values are implicated on judicial review, a reasonableness review is transformed into a correctness one, or saying that while both tribunals and courts can interpret the *Charter*, the administrative decision-maker has the necessary specialized expertise and discretionary power in the area where the *Charter* values are being balanced.

[53] The decisions of legal disciplinary bodies offer a good example of the problem of applying a correctness review whenever *Charter* values are implicated. Most breaches of art. 2.03 of the *Code of ethics* calling for "objectivity, moderation and dignity", necessarily engage the expressive rights of lawyers. That would mean that most exercises of disciplinary discretion under this provision would be transformed from the usual reasonableness review to one for correctness.

[54] Nevertheless, as McLachlin C.J. noted in *Catalyst*, "reasonableness must be assessed in the context of the particular type of decision making involved and all relevant factors. It is an essentially contextual inquiry" (para. 18). Deference is still justified on the basis of the decision-maker's expertise and its proximity to the facts of the case. Even where *Charter* values are involved, the administrative decision-maker will generally be in the best position to consider the impact of the relevant *Charter* values *on the specific facts of the case*. But both decision-makers and reviewing courts must remain conscious of the fundamental importance of *Charter* values in the analysis.

[52] Donc, nous avons le choix entre, d'une part, affirmer que, chaque fois qu'une partie prétend que des valeurs consacrées par la *Charte* sont en cause dans le cadre d'une révision judiciaire, un examen suivant la norme de la décision correcte doit se substituer à celui suivant la norme de la décision raisonnable ou, d'autre part, affirmer que, bien que les tribunaux et les cours de justice puissent interpréter la *Charte*, le décideur administratif possède l'expertise particulière exigée et le pouvoir discrétionnaire voulu dans le domaine où les valeurs consacrées par la *Charte* sont mises en balance.

[53] Les décisions d'organismes disciplinaires qui œuvrent relativement aux professions juridiques fournissent un bon exemple des problèmes que pose la révision judiciaire suivant la norme de la décision correcte dès lors que des valeurs consacrées par la *Charte* sont en cause. Le droit à la liberté d'expression des avocats est nécessairement en jeu dans la plupart des contraventions à l'art. 2.03 du *Code de déontologie*, qui exige que les avocats aient une conduite empreinte « d'objectivité, de modération et de dignité ». Il s'ensuit que la révision du caractère raisonnable normalement effectuée à l'égard de la plupart des décisions disciplinaires discrétionnaires fondées sur cette disposition deviendrait un contrôle de la justesse.

[54] Quoi qu'il en soit, comme la juge en chef McLachlin l'a souligné dans *Catalyst*, « le caractère raisonnable de la décision s'apprécie dans le contexte du type particulier de processus décisionnel en cause et de l'ensemble des facteurs pertinents. Il s'agit essentiellement d'une analyse contextuelle » (par. 18). Il continue donc à être justifié de faire preuve de déférence à l'endroit du décideur administratif compte tenu de son expertise et de sa proximité aux faits de la cause puisque, même quand les valeurs consacrées par la *Charte* sont en jeu, il sera généralement le mieux placé pour juger de l'incidence des valeurs pertinentes de ce type *au regard des faits précis de l'affaire*. Cela étant dit, tant les décideurs que les tribunaux qui procèdent à la révision de leurs décisions doivent analyser les questions qui leur sont soumises en gardant à l'esprit l'importance fondamentale des valeurs consacrées par la *Charte*.

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[55] How then does an administrative decision-maker apply *Charter* values in the exercise of statutory discretion? He or she balances the *Charter* values with the statutory objectives. In effecting this balancing, the decision-maker should first consider the statutory objectives. In *Lake*, for instance, the importance of Canada's international obligations, its relationships with foreign governments, and the investigation, prosecution and suppression of international crime justified the *prima facie* infringement of mobility rights under s. 6(1) (para. 27). In *Pinet*, the twin goals of public safety and fair treatment grounded the assessment of whether an infringement of an individual's liberty interest was justified (para. 19).

[56] Then the decision-maker should ask how the *Charter* value at issue will best be protected in view of the statutory objectives. This is at the core of the proportionality exercise, and requires the decision-maker to balance the severity of the interference of the *Charter* protection with the statutory objectives. This is where the role of judicial review for reasonableness aligns with the one applied in the *Oakes* context. As this Court recognized in *RJR-MacDonald Inc. v. Canada (Attorney General)*, [1995] 3 S.C.R. 199, at para. 160, "courts must accord some leeway to the legislator" in the *Charter* balancing exercise, and the proportionality test will be satisfied if the measure "falls within a range of reasonable alternatives". The same is true in the context of a review of an administrative decision for reasonableness, where decision-makers are entitled to a measure of deference so long as the decision, in the words of *Dunsmuir*, "falls within a range of possible, acceptable outcomes" (para. 47).

[57] On judicial review, the question becomes whether, in assessing the impact of the relevant *Charter* protection and given the nature of the

[55] Comment un décideur administratif applique-t-il donc les valeurs consacrées par la *Charte* dans l'exercice d'un pouvoir discrétionnaire que lui confère la loi? Il ou elle met en balance ces valeurs et les objectifs de la loi. Lorsqu'il procède à cette mise en balance, le décideur doit d'abord se pencher sur les objectifs en question. Dans *Lake*, par exemple, l'importance des obligations internationales du Canada, ses relations avec les gouvernements étrangers ainsi que l'enquête, la poursuite et la répression du crime à l'échelle internationale justifiait, *prima facie*, la violation de la liberté de circulation visée au par. 6(1) (par. 27). Dans *Pinet*, c'est le double objectif de protection de la sécurité du public et de traitement équitable qui a fondé l'évaluation de la violation du droit à la liberté pour déterminer si elle était justifiée (par. 19).

[56] Ensuite, le décideur doit se demander comment protéger au mieux la valeur en jeu consacrée par la *Charte* compte tenu des objectifs visés par la loi. Cette réflexion constitue l'essence même de l'analyse de la proportionnalité et exige que le décideur mette en balance la gravité de l'atteinte à la valeur protégée par la *Charte*, d'une part, et les objectifs que vise la loi, d'autre part. C'est à cette étape que le rôle de la révision judiciaire visant à juger du caractère raisonnable de la décision s'apparente à celui de l'analyse effectuée dans le contexte de l'application du test de l'arrêt *Oakes*. Comme la Cour l'a reconnu dans *RJR-MacDonald Inc. c. Canada (Procureur général)*, [1995] 3 R.C.S. 199, par. 160, « les tribunaux doivent accorder une certaine latitude au législateur » lorsqu'ils procèdent à une mise en balance au regard de la *Charte* et il sera satisfait au test de proportionnalité si la mesure « se situe à l'intérieur d'une gamme de mesures raisonnables ». Il en est de même dans le contexte de la révision d'une décision administrative pour en évaluer le caractère raisonnable où il convient de faire preuve d'une certaine déférence à l'endroit des décideurs à condition que la décision, comme l'affirme la Cour dans *Dunsmuir*, « [appartienne] aux issues possibles acceptables » (par. 47).

[57] Dans le contexte d'une révision judiciaire, il s'agit donc de déterminer si — en évaluant l'incidence de la protection pertinente offerte par la

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decision and the statutory and factual contexts, the decision reflects a proportionate balancing of the *Charter* protections at play. As LeBel J. noted in *Multani*, when a court is faced with reviewing an administrative decision that implicates *Charter* rights, "[t]he issue becomes one of proportionality" (para. 155), and calls for integrating the spirit of s. 1 into judicial review. Though this judicial review is conducted within the administrative framework, there is nonetheless conceptual harmony between a reasonableness review and the *Oakes* framework, since both contemplate giving a "margin of appreciation", or deference, to administrative and legislative bodies in balancing *Charter* values against broader objectives.

Charte et compte tenu de la nature de la décision et des contextes légal et factuel — la décision est le fruit d'une mise en balance proportionnée des droits en cause protégés par la *Charte*. Comme le juge LeBel l'a souligné dans *Multani*, lorsqu'une cour est appelée à réviser une décision administrative qui met en jeu les droits protégés par la *Charte*, « [l]a question se réduit à un problème de proportionnalité » (par. 155) et requiert d'intégrer l'esprit de l'article premier dans la révision judiciaire. Même si cette révision judiciaire est menée selon le cadre d'analyse du droit administratif, il existe néanmoins une harmonie conceptuelle entre l'examen du caractère raisonnable et le cadre d'analyse préconisé dans *Oakes* puisque les deux démarches supposent de donner une « marge d'appréciation » aux organes administratifs ou législatifs ou de faire preuve de déférence à leur égard lors de la mise en balance des valeurs consacrées par la *Charte*, d'une part, et les objectifs plus larges, d'autre part.

[58] If, in exercising its statutory discretion, the decision-maker has properly balanced the relevant *Charter* value with the statutory objectives, the decision will be found to be reasonable.

[58] Si, en exerçant son pouvoir discrétionnaire, le décideur a correctement mis en balance la valeur pertinente consacrée par la *Charte* et les objectifs visés par la loi, sa décision sera jugée raisonnable.

Application

Application

[59] The *Charter* value at issue in this appeal is expression, and, specifically, how it should be applied in the context of a lawyer's professional duties.

[59] En l'espèce, la valeur en jeu consacrée par la *Charte* est la liberté d'expression et la question à trancher est, plus précisément, celle de savoir comment cette liberté devrait pouvoir s'exercer dans le contexte des obligations professionnelles de l'avocat.

[60] At the relevant time, art. 2.03 of the *Code of ethics* (now modified as art. 2.00.01, O.C. 351-2004, (2004) 136 G.O. II, 1272) stated that "[t]he conduct of an advocate must bear the stamp of objectivity, moderation and dignity". This provision, whose constitutionality is not impugned before us, sets out a series of broad standards that are open to a wide range of interpretations. The determination of whether the actions of a lawyer violate art. 2.03 in a given case is left entirely to the Disciplinary Council's discretion.

[60] Au moment des faits, l'art. 2.03 du *Code de déontologie* (maintenant l'art. 2.00.01, décret 351-2004, (2004) 136 G.O. II, 1840) portait que « [l]a conduite de l'avocat doit être empreinte d'objectivité, de modération et de dignité ». Cette disposition, dont la constitutionnalité n'est pas attaquée devant nous, établit un ensemble de normes générales se prêtant à une multitude d'interprétations. La question de savoir si, dans un cas donné, la conduite d'un avocat contrevient à l'art. 2.03, est entièrement laissée à l'appréciation discrétionnaire du Comité de discipline.

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[61] No party in this dispute challenges the importance of professional discipline to prevent incivility in the legal profession, namely "potent displays of disrespect for the participants in the justice system, beyond mere rudeness or discourtesy" (Michael Code, "Counsel's Duty of Civility: An Essential Component of Fair Trials and an Effective Justice System" (2007), 11 *Can. Crim. L.R.* 97, at p. 101; see also Gavin MacKenzie, *Lawyers and Ethics: Professional Responsibility and Discipline* (5th ed. 2009), at p. 8-1). The duty to encourage civility, "both inside and outside the courtroom", rests with the courts and with lawyers (*R. v. Felderhof* (2003), 68 O.R. (3d) 481 (C.A.), at para. 83).

[62] As a result, rules similar to art. 2.03 are found in codes of ethics that govern the legal profession throughout Canada. The Canadian Bar Association's *Code of Professional Conduct* (2009), for example, states that a "lawyer should at all times be courteous, civil, and act in good faith to the court or tribunal and to all persons with whom the lawyer has dealings in the course of an action or proceeding" (c. IX, at para. 16; see also Law Society of Upper Canada, *Rules of Professional Conduct* (updated 2011), r. 6.03(5)).

[63] But in dealing with the appropriate boundaries of civility, the severity of the conduct must be interpreted in light of the expressive rights guaranteed by the *Charter*, and, in particular, the public benefit in ensuring the right of lawyers to express themselves about the justice system in general and judges in particular (MacKenzie, at p. 26-1; *R. v. Kopyto* (1987), 62 O.R. (2d) 449 (C.A.); and *Attorney-General v. Times Newspapers Ltd.*, [1974] A.C. 273 (H.L.)).

[64] In *Histed v. Law Society of Manitoba*, 2007 MBCA 150, 225 Man. R. (2d) 74, where Steel J.A. upheld a disciplinary decision resulting from a lawyer's criticism of a judge, the critical role played by lawyers in assuring the accountability of the judiciary was acknowledged:

[61] Nul ne conteste, en l'espèce, l'importance que revêtent les règles déontologiques pour la prévention de l'incivilité dans la profession juridique, à savoir [TRADUCTION] « les manifestations flagrantes d'irrespect pour les participants au système de justice, qui dépassent la simple impolitesse ou discourtoisie » (Michael Code, « Counsel's Duty of Civility : An Essential Component of Fair Trials and an Effective Justice System » (2007), 11 *Rev. can. D.P.* 97, p. 101; voir aussi Gavin MacKenzie, *Lawyers and Ethics : Professional Responsibility and Discipline* (5e éd. 2009), p. 8-1). C'est aux tribunaux et aux avocats qu'incombe le devoir de promouvoir la civilité [TRADUCTION] « tant à l'intérieur qu'à l'extérieur de la salle d'audience » (*R. c. Felderhof* (2003), 68 O.R. (3d) 481 (C.A.), par. 83).

[62] On trouve donc des règles analogues à l'art. 2.03 dans tous les codes de déontologie régissant la profession juridique au Canada. Par exemple, le *Code de déontologie professionnelle* (2009) de l'Association du Barreau canadien énonce que « [l]'avocat doit faire preuve de courtoisie et de civilité et agir de bonne foi envers le tribunal judiciaire ou administratif et toutes les personnes avec qui il interagit en cours d'instance ou de procès » (ch. IX, par. 16; voir aussi le *Code de déontologie* du Barreau du Haut-Canada (mis à jour en 2011), règle 6.03(5)).

[63] Toutefois, lorsqu'il s'agit de déterminer quand un comportement passe les bornes de la civilité, il faut tenir compte du droit à la liberté d'expression garanti par la *Charte* et, plus particulièrement, des avantages que procure à l'ensemble de la population l'exercice par les avocats du droit de s'exprimer au sujet du système de justice en général et au sujet des juges en particulier (MacKenzie, p. 26-1; *R. c. Kopyto* (1987), 62 O.R. (2d) 449 (C.A.); et *Attorney-General c. Times Newspapers Ltd.*, [1974] A.C. 273 (H.L.)).

[64] Dans *Histed c. Law Society of Manitoba*, 2007 MBCA 150, 225 Man. R. (2d) 74, la juge Steel a maintenu une décision disciplinaire relative à la critique d'un juge par un avocat et a reconnu le rôle primordial qu'assument les avocats en matière de responsabilité judiciaire :

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Not only should the judiciary be accountable and open to criticism, but lawyers play a very unique role in ensuring that accountability. As professionals with special expertise and officers of the court, lawyers are under a special responsibility to exercise fearlessness in front of the courts. They must advance their cases courageously, and this may result in criticism of proceedings before or decisions by the judiciary. The lawyer, as an intimate part of the legal system, plays a pivotal role in ensuring the accountability and transparency of the judiciary. To play that role effectively, he/she must feel free to act and speak without inhibition and with courage when the circumstances demand it. [Emphasis added; para. 71.]

[65] Proper respect for these expressive rights may involve disciplinary bodies tolerating a degree of discordant criticism. As the Ontario Court of Appeal observed in a different context in *Kopyto*, the fact that a lawyer is criticizing a judge, a tenured and independent participant in the justice system, may raise, not lower, the threshold for limiting a lawyer's expressive rights under the *Charter*. This does not by any means argue for an unlimited right on the part of lawyers to breach the legitimate public expectation that they will behave with civility.

[66] We are, in other words, balancing the fundamental importance of open, and even forceful, criticism of our public institutions with the need to ensure civility in the profession. Disciplinary bodies must therefore demonstrate that they have given due regard to the importance of the expressive rights at issue, both in light of an individual lawyer's right to expression and the public's interest in open discussion. As with all disciplinary decisions, this balancing is a fact-dependent and discretionary exercise.

[67] In this case, the 21-day suspension imposed on Mr. Doré is not before this Court, since Mr. Doré did not appeal it either to the Court of Appeal or to this Court. All we have been asked to determine is

[TRADUCTION] Non seulement les juges doivent-ils répondre de leurs actions et accepter la critique, mais les avocats jouent un rôle privilégié dans l'actualisation de cette responsabilité. En tant que professionnels spécialisés et officiers de justice, les avocats ont une obligation particulière d'intrépidité devant les tribunaux. Ils doivent plaider avec courage, ce qui peut les amener à critiquer le déroulement d'une instance ou une décision. Faisant partie intégrante du système de justice, les avocats jouent un rôle crucial dans l'actualisation de la responsabilité et de la transparence judiciaires. Pour s'acquitter efficacement de ce rôle, ils doivent se sentir libres d'agir et de parler sans contrainte et avec courage lorsque les circonstances l'exigent. [Je souligne; par. 71.]

[65] Il peut découler du respect qui est dû à ce droit à la liberté d'expression que des organismes disciplinaires tolèrent certaines critiques acérées. Comme la Cour d'appel de l'Ontario l'a signalé dans le contexte différent de l'arrêt *Kopyto*, le fait qu'un avocat critique un juge, un acteur indépendant et nommé à titre inamovible du système de justice, pourrait hausser, et non abaisser, le seuil au-delà duquel il convient de limiter l'exercice par un avocat du droit à la liberté d'expression que lui garantit la *Charte*. Cela étant dit, il ne faut surtout pas voir là d'argument pour un droit illimité des avocats de faire fi de la civilité que la société est en droit d'attendre d'eux.

[66] Autrement dit, les valeurs mises en balance sont, d'une part, l'importance fondamentale d'une critique ouverte et même vigoureuse de nos institutions publiques et, d'autre part, la nécessité d'assurer la civilité dans l'exercice de la profession juridique. Les organes disciplinaires doivent donc démontrer qu'ils ont dûment tenu compte de l'importance des droits d'expression en cause, tant dans la perspective du droit d'expression individuel des avocats que dans celle de l'intérêt public à l'ouverture des débats. Comme pour toutes les décisions disciplinaires, cette mise en balance dépend des faits et suppose l'exercice d'un pouvoir discrétionnaire.

[67] En l'espèce, la Cour n'est pas saisie de la sanction infligée à M^e^ Doré, soit une suspension de son droit de pratique durant 21 jours, puisque ce dernier n'en a pas fait appel ni en Cour d'appel ni

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whether the Disciplinary Council's conclusion that a reprimand was warranted under art. 2.03 of the *Code of ethics* was a reasonable one. To make that assessment, we must consider whether this result reflects a proportionate application of the statutory mandate with Mr. Doré's expressive rights.

[68] Lawyers potentially face criticisms and pressures on a daily basis. They are expected by the public, on whose behalf they serve, to endure them with civility and dignity. This is not always easy where the lawyer feels he or she has been unfairly provoked, as in this case. But it is precisely when a lawyer's equilibrium is unduly tested that he or she is particularly called upon to behave with transcendent civility. On the other hand, lawyers should not be expected to behave like verbal eunuchs. They not only have a right to speak their minds freely, they arguably have a duty to do so. But they are constrained by their profession to do so with dignified restraint.

[69] A reprimand for a lawyer does not automatically flow from criticizing a judge or the judicial system. As discussed, such criticism, even when it is expressed robustly, can be constructive. However in the context of disciplinary hearings, such criticism will be measured against the public's reasonable expectations of a lawyer's professionalism. As the Disciplinary Council found, Mr. Doré's letter was outside those expectations. His displeasure with Justice Boilard was justifiable, but the extent of the response was not.

[70] The Disciplinary Council recognized that a lawyer must have [TRANSLATION] "total liberty and independence in the defence of a client's rights", and "has the right to respond to criticism or remarks addressed to him by a judge", a right which the Council recognized "can suffer no

devant la Cour. Nous sommes uniquement appelés à déterminer si la conclusion du Comité de discipline selon laquelle il était justifié de le réprimander pour avoir contrevenu à l'art. 2.03 du *Code de déontologie* était raisonnable. Pour procéder à cette évaluation, nous devons examiner si ce résultat est le fruit d'une mise en balance proportionnée du mandat légal et du droit de M^e^ Doré à la liberté d'expression.

[68] Les avocats sont susceptibles d'être critiqués et de subir des pressions quotidiennement. Le public, au nom de qui ils exercent, s'attend à ce que ces officiers de justice encaissent les coups avec civilité et dignité. Ce n'est pas toujours facile lorsque l'avocat a le sentiment qu'il a été injustement provoqué comme en l'espèce. Il n'en demeure pas moins que c'est précisément dans les situations où le sang froid de l'avocat est indûment testé qu'il est tout particulièrement appelé à adopter un comportement d'une civilité transcendante. Cela étant dit, on ne peut s'attendre à ce que les avocats se comportent comme des eunuques de la parole. Ils ont non seulement le droit d'exprimer leurs opinions librement, mais possiblement le devoir de le faire. Ils sont toutefois tenus par leur profession de s'exécuter avec une retenue pleine de dignité.

[69] Un avocat qui critique un juge ou le système judiciaire n'est pas automatiquement passible d'une réprimande. Comme nous en avons discuté, une telle critique, même exprimée sans ménagement, peut être constructive. Cependant, dans le contexte d'audiences disciplinaires, une telle critique sera évaluée à la lumière des attentes raisonnables du public quant au professionnalisme dont un avocat doit faire preuve. Comme l'a conclu le Comité de discipline, la lettre de M^e^ Doré ne satisfait pas à ces attentes. Son mécontentement à l'égard du juge Boilard était légitime, mais la teneur de sa réponse ne l'était pas.

[70] Le Comité de discipline a reconnu que « [d]ans la poursuite de la défense des droits d'un client, l'avocat doit pouvoir jouir d'une totale liberté et indépendance » et a « le droit [. . .] de répondre à des critiques ou des remarques qui lui sont adressées par un juge », un droit qui, comme

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restrictions when it is a question of defending clients' rights before the courts" (paras. 68-70). It was also "conscious" of the fact that art. 2.03 may constitute a restriction on a lawyer's expressive rights (para. 79). But where, as here, the judge was called [TRANSLATION] "loathsome", arrogant and "fundamentally unjust" and was accused by Mr. Doré of "hid[ing] behind [his] status like a coward"; having a "chronic inability to master any social skills"; being "pedantic, aggressive and petty in [his] daily life"; having "obliterate[d] any humanity from [his] judicial position"; having "non-existent listening skills"; having a "propensity to use [his] court — where [he] lack[s] the courage to hear opinions contrary to [his] own — to launch ugly, vulgar, and mean personal attacks", which "not only confirms that [he is] as loathsome as suspected, but also casts shame on [him] as a judge"; and being "[un]able to face [his] detractors without hiding behind [his] judicial position", the Council concluded that the [TRANSLATION] "generally accepted norms of moderation and dignity" were "overstepped" (para. 86).

[71] In the circumstances, the Disciplinary Council found that Mr. Doré's letter warranted a reprimand. In light of the excessive degree of vituperation in the letter's context and tone, this conclusion cannot be said to represent an unreasonable balance of Mr. Doré's expressive rights with the statutory objectives.

[72] I would dismiss the appeal with costs.

Appeal dismissed with costs.

Solicitor for the appellant: Sophie Dormeau, Outremont.

l'a reconnu le Comité ne « prête à aucune concession lorsqu'il est question de défendre les droits des individus devant les tribunaux » (par. 68-70). Le Comité de discipline était aussi « conscient » du fait que l'art. 2.03 pouvait constituer une restriction à la liberté d'expression d'un avocat (par. 79). Mais lorsque, comme dans le cas présent, le juge a été traité d'« être exécrable », arrogant et « foncièrement injuste », et a été accusé par M^e^ Doré de se « cach[er] lâchement derrière [son] statut », d'avoir une « incapacité chronique à maîtriser quelque aptitude sociale », d'« adopter un comportement pédant, hargneux et mesquin dans [sa] vie de tous les jours », d'avoir « évacu[é] toute humanité de [sa] magistrature », d'avoir une « capacité d'écoute à toutes fins pratiques nulle », d'avoir une « propension à [se] servir de [sa] tribune — de laquelle [il] n'[a] pas le courage de faire face à l'expression d'opinions contraires aux [siennes] — pour [s']adonner à des attaques personnelles d'une mesquinerie à ce point repoussante qu'elles en sont vulgaires » ce qui « non seulement confirme [*sic*] l'être exécrable qu'on devine mais encore, font de [sa] magistrature une honte », et d'être incapable « en l'absence de [son] paravent judiciaire, [. . .] de faire face à [ses] détracteurs », le Comité de discipline a conclu que « la norme de modération et de dignité généralement acceptée » a été « outrepassée » (par. 86).

[71] Dans les circonstances, le Comité de discipline a conclu que la lettre de M^e^ Doré justifiait qu'il fasse l'objet d'une réprimande. À la lumière du degré excessif de vitupération dans le contenu de la lettre et de son ton, on ne peut prétendre que cette conclusion est le fruit d'une mise en balance déraisonnable du droit à la liberté d'expression de M^e^ Doré, d'une part, et des objectifs visés par la loi, d'autre part.

[72] En conséquence, je suis d'avis de rejeter le pourvoi avec dépens.

Pourvoi rejeté avec dépens.

Procureur de l'appelant : Sophie Dormeau, Outremont.

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Solicitors for the respondent Pierre Bernard, in his capacity as Assistant Syndic of the Barreau du Québec: Mercier Leduc, Montréal.

Solicitor for the respondents Tribunal des professions and the Attorney General of Quebec: Attorney General of Quebec, Sainte-Foy.

Solicitors for the intervener the Federation of Law Societies of Canada: BCF, Montréal.

Solicitors for the intervener the Canadian Civil Liberties Association: Osler, Hoskin & Harcourt, Montréal.

Solicitors for the intervener the Young Bar Association of Montreal: Irving Mitchell Kalichman, Westmount.

Procureurs de l'intimé Pierre Bernard, ès qualités de syndic adjoint du Barreau du Québec : Mercier Leduc, Montréal.

Procureur des intimés le Tribunal des professions et le procureur général du Québec : Procureur général du Québec, Sainte-Foy.

Procureurs de l'intervenante la Fédération des ordres professionnels de juristes du Canada : BCF, Montréal.

Procureurs de l'intervenante l'Association canadienne des libertés civiles : Osler, Hoskin & Harcourt, Montréal.

Procureurs de l'intervenante l'Association du Jeune Barreau de Montréal : Irving Mitchell Kalichman, Westmount.

2012 SCC 12 (CanLII)

Real Cardinal and Eric Oswald *Appellants*;

and

Director of Kent Institution *Respondent.*

File No.: 17364.

1984: October 11, 12; 1985: December 19.

Present: Dickson C.J. and Beetz, Estey, McIntyre, Lamer, Wilson and Le Dain JJ.

ON APPEAL FROM THE COURT OF APPEAL FOR BRITISH COLUMBIA

Prisons — Administrative dissociation or segregation — Segregation imposed following alleged involvement in hostage-taking incident — Segregation continued by Director despite recommendation of Segregation Review Board — Prisoners not informed by Director of his reasons for refusing to follow recommendation and not given a hearing by the Director on the question — Whether or not Director in breach of duty to act fairly rendering continued segregation of prisoners unlawful — Penitentiary Service Regulations, C.R.C. 1978, c. 1251, s. 40.

Judicial review — Prerogative writs — Habeas corpus with certiorari in aid — Segregation imposed following alleged involvement in hostage-taking incident — Segregation continued by Director despite recommendation of the Segregation Review Board — Prisoners not informed by Director of his reasons for refusing to follow recommendation and not given a hearing by the Director on the question — Whether or not Director in breach of duty to act fairly rendering continued segregation of prisoners unlawful — Whether provincial superior court has jurisdiction to issue certiorari in aid of habeas corpus — Whether affidavits admissible on habeas corpus alone to show jurisdictional error — Whether habeas corpus lies to challenge the validity of a particular form of confinement in a penitentiary — Judicial review jurisdiction of Federal Court of Canada — Penitentiary Service Regulations, C.R.C. 1978, c. 1251, s. 40 — Federal Court Act, R.S.C. 1970 (2nd Supp.), c. 10, s. 18.

Appellants were prisoners who were allegedly involved in a hostage-taking incident in Matsqui Institution. Criminal charges of forcible seizure and attempted escape were laid against them. They were transferred to Kent Institution where they were placed, on the Director's oral instructions, in administrative dissociation or

Real Cardinal et Eric Oswald *Appelants*;

et

Directeur de l'établissement Kent *Intimé.*

N° du greffe: 17364.

1984: 11, 12 octobre; 1985: 19 décembre.

Présents: Le juge en chef Dickson et les juges Beetz, Estey, McIntyre, Lamer, Wilson et Le Dain.

EN APPEL DE LA COUR D'APPEL DE LA COLOMBIE-BRITANNIQUE

Prisons — Ségrégation ou isolement administratifs — Ségrégation imposée après une participation alléguée à une prise d'otage — Ségrégation maintenue par le directeur malgré la recommandation du Conseil d'examen des cas de ségrégation — Directeur n'indiquant pas aux détenus les motifs de son refus de suivre la recommandation et ne leur accordant pas d'audition sur la question — Le directeur a-t-il ou non violé l'obligation d'agir équitablement rendant illégal le maintien de la ségrégation des détenus? — Règlement sur le service des pénitenciers, C.R.C. 1978, chap. 1251, art. 40.

Contrôle judiciaire — Brefs de prérogative — Habeas corpus avec certiorari auxiliaire — Ségrégation imposée après une participation alléguée à une prise d'otage — Ségrégation maintenue par le directeur malgré la recommandation du Conseil d'examen des cas de ségrégation — Directeur n'indiquant pas aux détenus les motifs de son refus de suivre la recommandation et ne leur accordant pas d'audition sur la question — Le directeur a-t-il ou non violé l'obligation d'agir équitablement rendant illégal le maintien de la ségrégation des détenus? — Une cour supérieure provinciale a-t-elle compétence pour délivrer un certiorari auxiliaire d'un habeas corpus? — Des affidavits sont-ils recevables en cas d'habeas corpus simple pour établir une erreur de compétence? — Peut-on recourir à l'habeas corpus pour contester la validité d'une forme particulière d'incarcération dans un pénitencier? — Compétence en matière d'examen judiciaire de la Cour fédérale du Canada — Règlement sur le service des pénitenciers, C.R.C. 1978, chap. 1251, art. 40 — Loi sur la Cour fédérale, S.R.C. 1970 (2e Supp.), chap. 10, art. 18.

Les appelants étaient des détenus qui auraient participé à une prise d'otage à l'établissement de Matsqui. Ils ont été accusés de saisie de force et de tentative d'évasion. Ils ont été transférés à l'établissement Kent où, sur les instructions verbales du directeur, ils ont été placés en ségrégation ou isolement administratifs, conformé-

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segregation, pursuant to s. 40 of the *Penitentiary Service Regulations*, on the ground that it was necessary for the maintenance of good order and discipline in the institution. The Director did not make an independent inquiry into the alleged involvement of the appellants in the hostage-taking incident but relied on what he had heard from the warden of Matsqui Institution and personnel at regional headquarters. The Segregation Review Board, which reviewed the appellants' segregation monthly in accordance with s. 40 of the Regulations, recommended that they be released from administrative segregation into the general prison population. The Director refused to follow the Board's recommendation on the ground that the appellants' release from segregation before the disposition of the criminal charges pending against them would "probably" or "possibly" introduce an unsettling element into the prison population. The Director did not inform the appellants of his reasons for refusing to follow the Board's recommendation and did not give them an opportunity to be heard as to whether he should act in accordance with the recommendation.

Appellants challenged their continued confinement in administrative dissociation or segregation by applications for *habeas corpus* with *certiorari* in aid. McEachern C.J.S.C. in the Supreme Court of British Columbia held that the Court had jurisdiction to issue *certiorari* in aid of *habeas corpus*, despite the exclusive jurisdiction by way of *certiorari* of the Federal Court of Canada under s. 18 of the *Federal Court Act*, and that *habeas corpus* would lie to determine the validity of confinement in administrative segregation. On the merits of the applications, he held that the continued segregation of the appellants, despite the recommendation of the Segregation Review Board, had become unlawful because of a breach of the duty of procedural fairness, and he ordered the release of the appellants into the general population of the penitentiary. The British Columbia Court of Appeal held that the Supreme Court had jurisdiction to issue *certiorari* in aid of *habeas corpus*, that the Court could on *habeas corpus* alone consider affidavit evidence to determine whether there had been an absence or excess of jurisdiction, and that *habeas corpus* would lie to determine the validity of confinement in administrative segregation, but a majority of the Court of Appeal held that the continued segregation of the appellants had not been rendered unlawful by a breach of the duty of procedural fairness. The appeal was accordingly allowed.

Held: The appeal should be allowed.

ment à l'art. 40 du *Règlement sur le service des pénitenciers*, parce que c'était nécessaire au maintien de l'ordre et de la discipline dans l'établissement. Le directeur n'a pas fait d'enquête indépendante sur la participation alléguée des appelants à la prise d'otage, mais s'est fondé sur ce qu'il avait appris du directeur de l'établissement de Matsqui et du personnel du bureau central régional. Le Conseil d'examen des cas de ségrégation, qui a examiné la ségrégation des appelants chaque mois conformément à l'art. 40 du Règlement, a recommandé leur réintégration dans la population carcérale générale. Le directeur a refusé de suivre la recommandation du Conseil parce que la levée de la ségrégation des appelants avant la décision sur les accusations criminelles pendantes contre eux aurait comme conséquence «probable» ou «possible» d'amener un élément perturbateur dans la population carcérale. Le directeur n'a pas indiqué aux appelants pourquoi il refusait de suivre la recommandation du Conseil et il ne leur a pas accordé la possibilité de se faire entendre sur le point de savoir s'il devrait suivre la recommandation.

Les appelants ont contesté le maintien de leur incarcération en ségrégation ou isolement administratifs par des demandes d'*habeas corpus* avec *certiorari* auxiliaire. En Cour suprême de la Colombie-Britannique, le juge en chef McEachern a décidé que la cour avait compétence pour délivrer un *certiorari* auxiliaire d'un *habeas corpus*, malgré la compétence exclusive de la Cour fédérale du Canada en matière de *certiorari* en vertu de l'art. 18 de la *Loi sur la Cour fédérale*, et qu'on pouvait recourir à l'*habeas corpus* pour déterminer la validité de l'incarcération en ségrégation administrative. Sur le fond des demandes, il a statué que le maintien de la ségrégation, malgré la recommandation du Conseil d'examen des cas de ségrégation, était illégal à cause d'une violation de l'obligation de respecter l'équité dans la procédure. Il a ordonné la réintégration des appelants dans la population générale du pénitencier. La Cour d'appel de la Colombie-Britannique a conclu que la Cour suprême avait compétence pour délivrer un *certiorari* auxiliaire d'un *habeas corpus*, que, lors d'une demande d'*habeas corpus* simple, elle pouvait examiner la preuve par affidavit pour déterminer s'il y avait eu défaut ou excès de compétence et qu'on pouvait recourir à l'*habeas corpus* pour déterminer la validité de l'incarcération en ségrégation administrative. Toutefois la Cour d'appel à la majorité a décidé que la violation de l'obligation d'équité dans la procédure ne rendait pas illégal le maintien de la ségrégation des appelants. L'appel a donc été accordé.

Arrêt: Le pourvoi est accueilli.

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For the reasons given in *R. v. Miller*, [1985] 2 S.C.R. 613, the Court of Appeal correctly concluded (a) that the British Columbia Supreme Court had jurisdiction to issue *certiorari* in aid of *habeas corpus*; (b) that the Court could on an application for *habeas corpus* alone consider affidavit evidence to determine whether there had been an absence or excess of jurisdiction; and (c) that *habeas corpus* would lie to determine the validity of the confinement of an inmate in administrative dissociation or segregation, and if such confinement be found to be unlawful to order his release into the general population of the institution.

The Director was under a duty of procedural fairness in exercising the authority conferred by s. 40 of the Regulations with respect to administrative dissociation or segregation. At common law, a duty of procedural fairness lies on every public authority making an administrative decision which is not of a legislative nature and which affects the rights, privileges or interests of an individual. The duty of procedural fairness has been held to apply in principle to disciplinary proceedings within a penitentiary, and although administrative segregation is distinguished from punitive or disciplinary segregation in the Regulations, the effect on the prisoner is the same and gives rise to the duty to act fairly. The extent to which procedural requirements are imposed in the prison setting must, however, be approached with caution.

The original imposition of administrative dissociation or segregation on the appellants was a lawful exercise of the Director's discretionary authority and was not carried out unfairly. In view of the urgent or emergency nature of the decision there could be no requirement of prior notice and hearing. In the case of the Director's decision to continue the appellants' segregation, despite the recommendation of the Segregation Review Board that they be released into the general population of the penitentiary, procedural fairness required that the Director inform the appellants of the reasons for his intended decision and give them an opportunity before him, however informal, to state their case for release. These minimal requirements of procedural fairness were fully compatible with the concern that the process of prison administration, because of its special nature and exigencies, should not be unduly burdened or obstructed by the imposition of unreasonable or inappropriate procedural requirements.

As to the possible suggestion in the decision of the majority of the Court of Appeal that the breach of the duty of procedural fairness, if any, was not of sufficient consequence to render the continued segregation of the

Pour les motifs donnés dans l'arrêt *R. c. Miller*, [1985] 2 R.C.S. 613, la Cour d'appel a eu raison de conclure a) que la Cour suprême de la Colombie-Britannique a compétence pour délivrer un *certiorari* auxiliaire d'un *habeas corpus*; b) qu'elle pouvait, lors d'une demande d'*habeas corpus* simple, examiner la preuve par affidavit pour déterminer s'il y avait défaut ou excès de compétence et c) qu'on pouvait recourir à l'*habeas corpus* pour déterminer la validité de l'incarcération d'un détenu en ségrégation administrative et, si cette dernière était jugée illégale, ordonner sa réintégration dans la population générale du pénitencier.

Le directeur avait l'obligation de respecter l'équité dans la procédure en exerçant le pouvoir que lui confère l'art. 40 du Règlement à l'égard de la ségrégation ou de l'isolement administratifs. En *common law*, une obligation de respecter l'équité dans la procédure incombe à tout organisme public qui rend des décisions administratives qui ne sont pas de nature législative et qui touchent les droits, les privilèges ou les biens d'une personne. L'obligation de respecter l'équité dans la procédure s'applique en principe aux procédures disciplinaires dans un pénitencier et, bien que la ségrégation administrative se distingue de la ségrégation punitive ou disciplinaire prévue au Règlement, l'effet sur le détenu est le même et est de nature à donner lieu à une obligation d'agir avec équité. Il faut toutefois aborder avec prudence la portée qu'on donne aux exigences de procédure dans le milieu carcéral.

L'imposition de la ségrégation administrative à l'origine constituait un exercice légal du pouvoir discrétionnaire du directeur et n'a pas été faite inéquitablement. Vu la nature pressante ou urgente de la décision, on ne pouvait exiger ni un avis ni une audition préalables. Étant donné la décision du directeur de maintenir la ségrégation des appelants malgré la recommandation du Conseil d'examen des cas de ségrégation qu'ils soient réintégrés dans la population générale du pénitencier, l'équité dans la procédure exigeait que le directeur fasse connaître aux appelants les motifs de sa décision prochaine et qu'il leur donne la possibilité, même informelle, de faire valoir leurs arguments en faveur de leur réintégration. Ces exigences minimales d'équité dans la procédure sont tout à fait compatibles avec le souci de ne pas alourdir ou bloquer indûment le processus de l'administration carcérale, vu sa nature et ses besoins spéciaux, par l'imposition d'exigences de procédure déraisonnables ou impropres.

Quant à la suggestion dans la décision de la majorité en Cour d'appel que la violation de l'obligation de respecter l'équité dans la procédure, le cas échéant, n'avait pas de conséquences suffisantes pour rendre illé-

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appellants unlawful, the denial of a right to a fair hearing must always render a decision invalid, whether or not it may appear to a reviewing court that the hearing would likely have resulted in a different decision. The right to a fair hearing must be regarded as an independent, unqualified right which finds its essential justification in the sense of procedural justice which any person affected by an administrative decision is entitled to have. It is not for a court to deny that right and sense of justice on the basis of speculation as to what the result might have been had there been a hearing.

By his failure to afford the appellants a fair hearing on the question whether he should act in accordance with the recommendation of the Segregation Review Board the Director rendered the continued segregation of the appellants unlawful. They, therefore, had a right on *habeas corpus* to be released from administrative dissociation or segregation into the general population of the penitentiary.

Cases Cited

R. v. Miller, [1985] 2 S.C.R. 613, followed; *Nicholson v. Haldimand-Norfolk Regional Board of Commissioners of Police*, [1979] 1 S.C.R. 311; *Martineau v. Matsqui Institution Disciplinary Board (No. 2)*, [1980] 1 S.C.R. 602; *Attorney General of Canada v. Inuit Tapirisat of Canada*, [1980] 2 S.C.R. 735; *R. v. Hull Prison Board of Visitors, ex parte St Germain*, [1979] 1 All E.R. 701, referred to.

Statutes and Regulations Cited

Federal Court Act, R.S.C. 1970 (2nd Supp.), c. 10, s. 18.
Penitentiary Act, R.S.C. 1970, c. P-6.
Penitentiary Service Regulations, C.R.C. 1978, c. 1251, s. 40(1), (2).

APPEAL from a judgment of the British Columbia Court of Appeal, [1982] 3 W.W.R. 593, 137 D.L.R. (3d) 145, 67 C.C.C. (2d) 252, 35 B.C.L.R. 201, allowing an appeal from orders of McEachern C.J.S.C. granting relief upon applications for *habeas corpus* with *certiorari* in aid and ordering appellants' release from administrative dissociation into the general prison population. Appeal allowed.

B. A. Crane, Q.C., for the appellants.

gal le maintien de la ségrégation des appelants, la négation du droit à une audition équitable doit toujours rendre une décision invalide, que la cour qui exerce le contrôle considère ou non que l'audition aurait vraisemblablement amené une décision différente. Il faut considérer le droit à une audition équitable comme un droit distinct et absolu qui trouve sa justification essentielle dans le sens de la justice en matière de procédure à laquelle toute personne touchée par une décision administrative a droit. Il n'appartient pas aux tribunaux de refuser ce droit et ce sens de la justice en fonction d'hypothèses sur ce qu'aurait pu être le résultat de l'audition.

En omettant d'offrir aux appelants une audition équitable sur la question de savoir s'il devrait suivre la recommandation du Conseil d'examen des cas de ségrégation, le directeur a rendu illégal le maintien de la ségrégation des appelants. Ils avaient donc droit en vertu d'un bref d'*habeas corpus* à la levée de leur ségrégation ou isolement administratifs et à leur réintégration dans la population générale du pénitencier.

Jurisprudence

Arrêt suivi: *R. c. Miller*, [1985] 2 R.C.S. 613; arrêts mentionnés: *Nicholson c. Haldimand-Norfolk Regional Board of Commissioners of Police*, [1979] 1 R.C.S. 311; *Martineau c. Comité de discipline de l'Institution de Matsqui (N° 2)*, [1980] 1 R.C.S. 602; *Procureur général du Canada c. Inuit Tapirisat of Canada*, [1980] 2 R.C.S. 735; *R. v. Hull Prison Board of Visitors, ex parte St Germain*, [1979] 1 All E.R. 701.

Lois et règlements cités

Loi sur la Cour fédérale, S.R.C. 1970 (2e Supp.), chap. 10, art. 18.
Loi sur les pénitenciers, S.R.C. 1970, chap. P-6.
Règlement sur le service des pénitenciers, C.R.C. 1978, chap. 1251, art. 40(1), (2).

POURVOI contre un arrêt de la Cour d'appel de la Colombie-Britannique, [1982] 3 W.W.R. 593, 137 D.L.R. (3d) 145, 67 C.C.C. (2d) 252, 35 B.C.L.R. 201, qui a accueilli l'appel à l'encontre des ordonnances du juge en chef McEachern de la Cour suprême qui avait accueilli les demandes d'*habeas corpus* avec *certiorari* auxiliaire et ordonné la levée de la ségrégation administrative des appelants et leur réintégration dans la population carcérale générale. Pourvoi accueilli.

B. A. Crane, c.r., pour les appelants.

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W. B. Scarth, Q.C., and *Mary Humphries*, for the respondent.

The judgment of the Court was delivered by

LE DAIN J.—The general question in this appeal is whether relief by way of *habeas corpus* with *certiorari* in aid is available in a provincial superior court to obtain the release of a prisoner in a federal penitentiary from administrative dissociation or segregation into normal association with the general population of the penitentiary on the ground that the segregation was imposed or continued in breach of the requirements of procedural fairness.

The appeal is by leave of this Court from the judgment of the British Columbia Court of Appeal on March 31, 1982, [1982] 3 W.W.R. 593, 67 C.C.C. (2d) 252, allowing an appeal from the judgment of McEachern C.J. of the Supreme Court of British Columbia on December 30, 1980 granting relief upon applications for *habeas corpus* with *certiorari* in aid and ordering that the appellants be released from administrative dissociation or segregation in Kent Institution into the general population of the penitentiary, subject to all the jurisdiction of the Director as set forth in the *Penitentiary Act*, R.S.C. 1970, c. P-6, and regulations thereunder.

I

The appellants were imprisoned in Matsqui Institution when, on July 27, 1980, they became involved in a hostage-taking incident in which they allegedly held a guard at knifepoint and unlawfully confined him for five hours. Criminal charges of forcible seizure and attempted escape were laid against the appellants, and on July 28, 1980 they were transferred to Kent Institution, a maximum security penitentiary, where they were placed in administrative dissociation or segregation on the oral instructions of the warden (hereinafter referred to as the "Director") of the institution, pursuant to s. 40(1)(*a*) of the *Penitentiary Service Regulations*, C.R.C. 1978, c. 1251. Section 40 reads as follows:

W. B. Scarth, c.r., et *Mary Humphries*, pour l'intimé.

Version française du jugement de la Cour rendu par

LE JUGE LE DAIN—La question générale soulevée par le présent pourvoi est de savoir si on peut demander à une cour supérieure provinciale un bref d'*habeas corpus* avec *certiorari* auxiliaire en vue d'obtenir la levée de la ségrégation ou de l'isolement administratifs d'un détenu incarcéré dans un pénitencier fédéral et sa réintégration dans la population générale du pénitencier pour le motif que la ségrégation a été imposée ou prolongée en violation des exigences de l'équité dans la procédure.

Ce pourvoi, autorisé par cette Cour, vise l'arrêt de la Cour d'appel de la Colombie-Britannique rendu le 31 mars 1982, [1982] 3 W.W.R. 593, 67 C.C.C. (2d) 252, lequel a accueilli l'appel des ordonnances du juge en chef McEachern de la Cour suprême de la Colombie-Britannique rendues le 30 décembre 1980 qui accordaient le recours demandé sur requêtes en *habeas corpus* avec *certiorari* auxiliaire et ordonnaient la levée de la ségrégation ou de l'isolement administratifs des appelants à l'établissement Kent pour qu'ils puissent réintégrer la population générale du pénitencier, sous réserve de tous les pouvoirs du directeur énoncés à la *Loi sur les pénitenciers*, S.R.C. 1970, chap. P-6, et son règlement d'application.

I

Les appelants étaient détenus à l'établissement de Matsqui lorsque, le 27 juillet 1980, ils ont été mêlés à une prise d'otage au cours de laquelle ils auraient détenu un garde sous la menace d'un couteau et l'auraient illégalement séquestré pendant cinq heures. Des accusations de saisie de force et de tentative d'évasion ont été portées contre eux et, le 28 juillet 1980, ils ont été transférés à l'établissement Kent, un pénitencier à sécurité maximale, où ils ont été placés en ségrégation ou isolement administratifs sur les instructions verbales du directeur de l'établissement en application de l'al. 40(1)*a*) du *Règlement sur le service des pénitenciers*, C.R.C. 1978, chap. 1251. L'article 40 est ainsi rédigé:

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40. (1) Where the institutional head is satisfied that

(*a*) for the maintenance of good order and discipline in the institution, or

(*b*) in the best interests of an inmate

it is necessary or desirable that the inmate should be kept from associating with other inmates, he may order the inmate to be dissociated accordingly, but the case of every inmate so dissociated shall be considered, not less than once each month, by the Classification Board for the purpose of recommending to the institutional head whether or not the inmate should return to association with other inmates.

(2) An inmate who has been dissociated is not considered under punishment unless he has been sentenced as such and he shall not be deprived of any of his privileges and amenities by reason thereof, except those privileges and amenities that

(*a*) can only be enjoyed in association with other inmates, or

(*b*) cannot reasonably be granted having regard to the limitations of the dissociation area and the necessity for the effective operation thereof.

Administrative dissociation or segregation, as it was called by the Director of Kent Institution in his evidence, and as it will for convenience be referred to hereinafter, is a form of confinement involving severe restrictions on mobility, activity and association. It is described in the reasons for judgment of McEachern C.J.S.C. as follows:

The liberty and freedom of a prisoner placed in segregation is further reduced, and solitary confinement (a term the Director does not accept) is a phrase used by prisoners to describe segregation.

The cells used to house prisoners in segregation are 6 feet wide, 10 feet long and 8 feet high. Access is gained through a solid door containing a small window. There is a window on the outside wall. The cell contains a radio, a bed, and a combination basin/toilet.

The regular routine for these prisoners in the absence of outside visitors or consultation with lawyers, et cetera, is to be locked in their cells for 23 hours per day, with one hour for exercise. Visitors are permitted to visit every day Monday through Friday. Lawyers are permitted to visit as a general rule on Tuesdays and Wednesdays. Prisoners in segregation have access to a canteen, but there are limits on what they can purchase. They are

40. (1) Si le chef de l'institution est convaincu que,

a) pour le maintien du bon ordre et de la discipline dans l'institution, ou

b) dans le meilleur intérêt du détenu,

il est nécessaire ou opportun d'interdire au détenu de se joindre aux autres, il peut le lui interdire, mais le cas d'un détenu ainsi placé à l'écart doit être étudié, au moins une fois par mois, par le Comité de classement qui recommandera au chef de l'institution la levée ou le maintien de cette interdiction.

(2) Un détenu placé à l'écart n'est pas considéré comme frappé d'une peine à moins qu'il n'y ait été condamné, et il ne doit, pour autant, perdre aucun de ses privilèges et agréments, sauf ceux

a) dont il ne peut jouir qu'en se joignant aux autres détenus; ou

b) qui ne peuvent pas raisonnablement être accordés, compte tenu des limitations du lieu où le détenu est ainsi placé à l'écart et de l'obligation d'administrer ce lieu de façon efficace.

L'isolement administratif ou la ségrégation administrative, expression que le directeur de l'établissement Kent a employé dans son témoignage et que nous allons utiliser ci-après, est une forme d'incarcération comportant des restrictions graves à la mobilité, aux activités et aux contacts avec les autres détenus. Elle est ainsi décrite dans les motifs de jugement du juge en chef McEachern de la Cour suprême:

[TRADUCTION] La liberté d'un détenu en ségrégation est encore plus réduite, et l'isolement cellulaire (un terme que le directeur refuse) est l'expression utilisée par les détenus pour décrire la ségrégation.

Les cellules qui servent à loger les prisonniers en ségrégation ont 6 pieds de large, 10 pieds de long et 8 pieds de haut. On y entre par une porte pleine comportant une petite fenêtre. Il y a une fenêtre dans le mur donnant sur l'extérieur. La cellule comprend un appareil radio, un lit et un combiné lavabo-toilette.

La routine, pour ces détenus lorsqu'ils n'ont pas de visite de l'extérieur ou de consultation avec leur avocat, etc. consiste à être sous clef dans leur cellule 23 heures par jour, avec une heure d'exercice. Ils peuvent recevoir quotidiennement des visites du lundi au vendredi. En règle générale, ils peuvent recevoir la visite de leur avocat les mardi et mercredi. Les détenus en ségrégation ont accès à une cantine, mais il y a des limitations à ce

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paid an allowance (the amount was not specified) at the same grade they were paid before being segregated. I mention these matters, because the Director makes a point that administrative dissociation is not the same thing as what is often called solitary confinement.

The segregation of the appellants was reviewed once a month, in accordance with s. 40 of the Regulations, by a classification board called the Segregation Review Board, which was composed of members of the penitentiary staff. The appellants appeared before the Board. On October 7, 1980 the Board recommended to the Director that the appellants be returned to normal association with the general prison population. The Director declined to follow this recommendation. In its subsequent reviews of the appellants' case the Board maintained its favourable recommendation, but the Director continued to hold them in segregation. At the time their applications for *habeas corpus* with *certiorari* in aid were heard in November 1980, they had been in segregation for some four months, and the indication was that the Director would likely continue the segregation until disposition of the criminal charges against them.

In his affidavits filed in response to the appellants' applications for *habeas corpus* with *certiorari* in aid and in his testimony on cross-examination the Director indicated that he had ordered the segregation of the appellants because of what he had heard from the warden of Matsqui Institution and personnel at regional headquarters concerning the hostage-taking incident, and that apart from these conversations he had not made, and he did not intend to make, an independent inquiry into the appellants' alleged involvement in the incident. He had decided not to follow the recommendation of the Segregation Review Board because, while he accepted its favourable opinion of the appellants' conduct in Kent Institution, he believed that their release from segregation before the disposition of the criminal charges against them would result in the "probable" or "possible" introduction of an unsettling element into the general population of the institution and was therefore not in the interests of the maintenance of good order and discipline in the institution. He could not point to a

qu'ils peuvent y acheter. Ils reçoivent une allocation (le montant n'a pas été précisé) égale à celle qu'ils recevaient avant d'être en ségrégation. Je mentionne ces points, parce que le directeur a souligné que l'isolement administratif n'est pas la même chose que ce qu'on appelle souvent l'isolement cellulaire.

La ségrégation des appelants était révisée une fois par mois, conformément à l'art. 40 du Règlement, par un comité de classement appelé Conseil d'examen des cas de ségrégation composé de membres du personnel du pénitencier. Les appelants ont comparu devant le Conseil. Le 7 octobre 1980, le Conseil a recommandé au directeur la réintégration des appelants dans la population carcérale générale. Le directeur a refusé de suivre cette recommandation. Dans ses révisions subséquentes du cas des appelants, le Conseil a maintenu sa recommandation favorable, mais le directeur a continué de les maintenir en ségrégation. Au moment de l'audition de leurs demandes d'*habeas corpus* avec *certiorari* auxiliaire, en novembre 1980, ils avaient été en ségrégation pendant quatre mois, et tout indiquait que le directeur les y maintiendrait jusqu'à la décision relative aux accusations criminelles portées contre eux.

Dans les affidavits produits en réponse aux demandes d'*habeas corpus* avec *certiorari* auxiliaire des appelants et dans sa déposition en contre-interrogatoire, le directeur a indiqué qu'il avait ordonné la ségrégation des appelants à cause de ce qu'il avait appris du directeur de l'établissement de Matsqui et du personnel du bureau central régional à propos de la prise d'otage et qu'en dehors de ces conversations il n'avait ni mené ni n'avait l'intention de mener une enquête indépendante au sujet de la participation des appelants à cet incident. Il a décidé de ne pas suivre la recommandation du Conseil d'examen des cas de ségrégation parce que, même s'il acceptait l'opinion favorable du Conseil à propos de la conduite des appelants à l'établissement Kent, il croyait que la levée de leur ségrégation avant la décision sur les accusations criminelles portées contre eux aurait comme conséquence «probable» ou «possible» d'amener un élément perturbateur dans la population générale de l'établissement et, en conséquence, ne favorisait pas le maintien du bon ordre et de la discipline

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specific reason for holding this belief but based it on his personal assessment of the "dynamics" of the institution, a judgment which he referred to at one point as an "instinctive reaction" and conceded at another point could be described as a "gut reaction". He indicated that the primary consideration underlying his decision was the seriousness of the hostage-taking incident in which the appellants were alleged to have been involved, and he could not point to any factor that would be likely to change his decision before the question of their involvement had been clarified by disposition of the criminal charges. It was not for him to determine that question when it was before the courts.

Although the Director talked to the appellants he did not inform them of his reasons for refusing to follow the recommendation of the Segregation Review Board that they be released from segregation into the general population of the institution or afford them the opportunity of a hearing before him as to whether they should be released.

II

In their applications for *habeas corpus* with *certiorari* in aid and their supporting affidavits the appellants attacked the original imposition and continuation of their administrative segregation, despite the recommendation of the Segregation Review Board, on the ground that it was not necessary for the maintenance of good order and discipline in the institution. At the hearing of their applications, however, the jurisdictional issue that emerged was whether they had been denied procedural fairness in the imposition and continuation of their segregation. There also emerged two issues concerning the jurisdiction of the Court to entertain an application for *habeas corpus* with *certiorari* in aid to obtain the release of an inmate of a federal penitentiary from administrative segregation into normal association with the general population of the institution: (a) whether, in view of the exclusive jurisdiction of the Federal Court of Canada under s. 18 of the *Federal Court Act*, R.S.C. 1970 (2nd Supp.), c. 10, to issue *certiorari* against any federal board, commission or other

dans l'établissement. Il n'a pu donner de motif précis de cette conviction, mais il l'a fondée sur son évaluation personnelle de la «dynamique» de l'établissement, une appréciation qu'il a qualifiée à un moment donné de «réaction instinctive» et qui, a-t-il reconnu à un autre moment, pouvait se décrire comme une «réaction viscérale». Il a indiqué que la considération première de sa décision était la gravité de la prise d'otage à laquelle les appelants auraient participé et il n'a pu faire état d'un motif qui l'amènerait vraisemblablement à changer d'avis avant que la question de leur participation à l'incident n'ait été clarifiée par une décision sur les accusations criminelles. Il ne lui appartenait pas de trancher cette question alors qu'elle était soumise aux tribunaux.

Bien que le directeur ait parlé aux appelants, il ne leur a pas indiqué pourquoi il refusait de suivre la recommandation du Conseil d'examen des cas de ségrégation de lever leur ségrégation pour les réintégrer dans la population générale de l'établissement ni ne leur a accordé la possibilité de se faire entendre sur le point de savoir s'il devrait suivre la recommandation.

II

Dans leurs requêtes en *habeas corpus* avec *certiorari* auxiliaire et dans les affidavits à leur appui, les appelants contestent la ségrégation administrative qu'on leur a imposée à l'origine et son maintien, en dépit de la recommandation du Conseil d'examen des cas de ségrégation, pour le motif qu'elle n'était pas nécessaire au maintien du bon ordre et de la discipline dans l'établissement. À l'audition de leurs requêtes, cependant, la question de compétence qui s'est posée est celle de savoir s'il y avait eu manquement à l'équité dans la procédure à leur égard en raison de l'imposition et du maintien de la ségrégation. Il est aussi ressorti deux questions au sujet de la compétence de la cour d'entendre une requête en *habeas corpus* avec *certiorari* auxiliaire en vue d'obtenir la levée de la ségrégation administrative d'un détenu d'un pénitencier fédéral et sa réintégration dans la population générale de l'établissement: a) savoir si, étant donné la compétence exclusive de la Cour fédérale du Canada en vertu de l'art. 18 de la *Loi sur la Cour fédérale*, S.R.C. 1970 (2e Supp.), chap. 10,

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tribunal, the Supreme Court of British Columbia had jurisdiction to issue *certiorari* in aid of *habeas corpus*; and (b) whether *habeas corpus* will lie to challenge the validity of the confinement of an inmate in administrative segregation and, if such confinement be found to be unlawful, to order his release into the general population of the institution.

In the Supreme Court of British Columbia, McEachern C.J. held that the Court had jurisdiction to issue *certiorari* in aid of *habeas corpus* against a federal board, commission or other tribunal and that *habeas corpus* would lie to release an inmate from administrative segregation into the general population of a penitentiary. On the merits, he held that while the original imposition of segregation was not carried out with unfairness, its continuation despite the recommendation of the Segregation Review Board that the appellants be released into the general population of the institution was unlawful by reason of a denial of procedural fairness.

The British Columbia Court of Appeal (Nemetz C.J. and Macdonald and Anderson JJ.A.) were unanimously of the view, for reasons given by Anderson J.A., that the Supreme Court of British Columbia had jurisdiction to issue *certiorari* in aid of *habeas corpus*; that in any event a court could, on an application for *habeas corpus* alone, consider affidavit evidence in determining whether there had been an absence or excess of jurisdiction in ordering a detention; and that *habeas corpus* would lie to challenge the validity of confinement in administrative segregation and to order the release of an inmate from such segregation, if found unlawful, into the general population of the penitentiary. They were further agreed that in exercising the authority conferred by s. 40 of the regulations with respect to administrative segregation the Director had a duty of procedural fairness, but a majority of the Court (Nemetz C.J.B.C. and Macdonald J.A.), Anderson J.A. dissenting, held that there had not been a breach of that duty.

de délivrer un *certiorari* contre tout office, toute commission ou tout autre tribunal fédéral, la Cour suprême de la Colombie-Britannique a compétence pour délivrer un *certiorari* auxiliaire d'un *habeas corpus*; et b) savoir si l'on peut recourir à l'*habeas corpus* pour contester la validité de l'incarcération d'un détenu en ségrégation administrative et, si cette incarcération est jugée illégale, pour ordonner sa réintégration dans la population générale de l'établissement.

En Cour suprême de la Colombie-Britannique, le juge en chef McEachern a statué que la cour avait compétence pour délivrer un *certiorari* auxiliaire d'un *habeas corpus* contre un office, une commission ou un autre tribunal fédéral et que l'on peut recourir à l'*habeas corpus* pour libérer un détenu de la ségrégation administrative et ordonner sa réintégration dans la population générale de l'établissement. Sur le fond, il a statué que tandis que l'imposition de la ségrégation à l'origine ne comportait pas d'injustice, son maintien malgré la recommandation du Conseil d'examen des cas de ségrégation de réintégrer les appelants dans la population générale de l'établissement était illégal à cause d'un manquement à l'équité dans la procédure.

La Cour d'appel de la Colombie-Britannique (le juge en chef Nemetz et les juges Macdonald et Anderson) a été unanimement d'avis, pour les motifs exposés par le juge Anderson, que la Cour suprême de la Colombie-Britannique a compétence pour délivrer le *certiorari* auxiliaire de l'*habeas corpus*; que de toute façon une cour pouvait, lors d'une demande d'*habeas corpus* simple, examiner la preuve par affidavit pour déterminer s'il y avait eu défaut ou excès de compétence lorsqu'on a ordonné la détention; et que l'on peut recourir à l'*habeas corpus* pour contester la validité de l'incarcération en ségrégation administrative et ordonner la levée de cette ségrégation, si elle est jugée illégale, et la réintégration du détenu dans la population générale de l'établissement. Ils ont également été d'avis qu'en exerçant le pouvoir que lui accorde l'art. 40 du Règlement en matière de ségrégation administrative, le directeur a une obligation de respecter l'équité dans la procédure, mais la Cour d'appel à la majorité (le juge en chef

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Nemetz C.J.B.C. held that if there had been a breach of the duty of procedural fairness it was not of sufficient substance to amount to an excess of jurisdiction. On this ground the appeal was allowed and the judgment of McEachern C.J.S.C. ordering the release of the appellants into the general population of the penitentiary set aside.

The appellants appeal from the judgment of the Court of Appeal on the question whether there was a breach of the duty of procedural fairness in the continuation of their segregation despite the recommendation of the Segregation Review Board. While supporting the conclusion of the majority of the Court of Appeal on this issue, the respondent contends that the Supreme Court of British Columbia did not have jurisdiction to issue *certiorari* in aid of *habeas corpus* and that *habeas corpus* will not lie to obtain the release of an inmate of a penitentiary from administrative segregation into the general population of the institution.

It should be noted that at the time the appeal was heard by the British Columbia Court of Appeal the appellants had been released from Kent Institution. The court was of the view, however, that the appeal should be heard because of the general importance of the issues raised. This Court has proceeded on the same basis.

III

For the reasons given in *R. v. Miller*, [1985] 2 S.C.R. 613, which was heard at the same time as this appeal, I agree with the conclusions of the British Columbia Court of Appeal expressed in the reasons of Anderson J.A., with whom Nemetz C.J. and Macdonald J.A. concurred, on the three issues concerning the jurisdiction of the British Columbia Supreme Court: (a) that the Court had jurisdiction to issue *certiorari* in aid of *habeas corpus*; (b) that the Court could on an application for *habeas corpus* alone consider affidavit evidence to deter-

Nemetz et le juge Macdonald) le juge Anderson étant dissident, a conclu qu'il n'y avait pas eu violation de cette obligation. Le juge en chef Nemetz a décidé que, s'il y avait eu violation de cette obligation de respecter l'équité dans la procédure, elle n'avait pas suffisamment d'importance pour constituer un excès de compétence. Sur ce moyen, ils ont accueilli l'appel et infirmé l'ordonnance du juge en chef McEachern de la Cour suprême qui ordonnait la réintégration des appelants dans la population générale de l'établissement.

Les appelants se pourvoient contre l'arrêt de la Cour d'appel sur la question de savoir si le maintien de leur ségrégation, malgré la recommandation du Conseil d'examen des cas de ségrégation, viole l'obligation de respecter l'équité dans la procédure. Tout en demandant la confirmation de la conclusion majoritaire de la Cour d'appel sur cette question, l'intimé soutient que la Cour suprême de la Colombie-Britannique n'avait pas compétence pour délivrer le *certiorari* auxiliaire de l'*habeas corpus* et que l'on ne peut pas recourir à l'*habeas corpus* pour obtenir la levée de la ségrégation administrative d'un détenu dans un pénitencier et sa réintégration dans la population générale de l'établissement.

Il y a lieu de souligner qu'au moment où la Cour d'appel de la Colombie-Britannique a entendu l'appel, les appelants avaient été libérés de l'établissement Kent. La Cour d'appel a cependant estimé qu'il y avait lieu d'entendre l'appel à cause de l'importance générale des questions soulevées. Cette Cour a entendu le pourvoi pour le même motif.

III

Pour les motifs donnés dans l'affaire *R. c. Miller*, [1985] 2 R.C.S. 613, qui a été entendue en même temps que le présent pourvoi, je suis d'accord avec les conclusions de la Cour d'appel de la Colombie-Britannique exposées dans les motifs du juge Anderson, avec lesquels le juge en chef Nemetz et le juge Macdonald sont d'accord, sur les trois questions relatives à la compétence de la Cour suprême de la Colombie-Britannique: a) que la cour a compétence pour délivrer le *certiorari* auxiliaire de l'*habeas corpus*; b) que la cour pou-

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mine whether there had been an absence or excess of jurisdiction; and (c) that *habeas corpus* will lie to determine the validity of the confinement of an inmate in administrative segregation, and if such confinement be found to be unlawful, to order his release into the general inmate population of the institution. There is no significant difference, in so far as the last question is concerned, between confinement in administrative dissociation or segregation, pursuant to s. 40(1) of the *Penitentiary Service Regulations*, and confinement in a special handling unit, as in *Miller*, *supra*. Both are significantly more restrictive and severe forms of detention than that experienced by the general inmate population. Indeed, as indicated in the reasons for judgment in *Miller*, *supra*, Commissioner's Directive 274 of December 1, 1980 provides that phase 1 of confinement in a special handling unit shall consist of a period of assessment in administrative segregation.

vait, lors d'une demande d'*habeas corpus* simple examiner des affidavits pour déterminer s'il y avait défaut ou excès de compétence; et c) qu'on peut recourir à l'*habeas corpus* pour déterminer la validité de l'incarcération d'un détenu en ségrégation administrative et si celle-ci est jugée illégale, pour ordonner la levée de la ségrégation et la réintégration du détenu dans la population carcérale générale. Il n'y a pas de différence importante, pour ce qui est de la dernière question, entre l'incarcération en isolement ou en ségrégation administratifs conformément au par. 40(1) du *Règlement sur le service des pénitenciers*, et l'incarcération dans une unité spéciale de détention, comme dans l'arrêt *Miller*, précité. Les deux sont des formes de détention beaucoup plus restrictives et sévères que celle qui est imposée à la population carcérale générale. En réalité, comme l'indiquent les motifs de jugement dans l'arrêt *Miller*, précité, la directive n° 274 du commissaire en date du 1er décembre 1980 prévoit que la première phase d'incarcération dans une unité spéciale de détention consistera en une période d'évaluation en ségrégation administrative.

IV

There can be no doubt, as was held by McEachern C.J.S.C. and the Court of Appeal, that the Director was under a duty of procedural fairness in exercising the authority conferred by s. 40 of the Regulations with respect to administrative dissociation or segregation. This Court has affirmed that there is, as a general common law principle, a duty of procedural fairness lying on every public authority making an administrative decision which is not of a legislative nature and which affects the rights, privileges or interests of an individual: *Nicholson v. Haldimand-Norfolk Regional Board of Commissioners of Police*, [1979] 1 S.C.R. 311; *Martineau v. Matsqui Institution Disciplinary Board (No. 2)*, [1980] 1 S.C.R. 602; *Attorney General of Canada v. Inuit Tapirisat of Canada*, [1980] 2 S.C.R. 735. In *Martineau (No. 2)*, *supra*, the Court held that the duty of procedural fairness applied in principle to disciplinary proceedings within a penitentiary. Although administrative segregation is distinguished from punitive or disciplinary segregation under s. 40 of the *Penitentiary*

IV

Il ne peut y avoir de doute, ainsi que l'ont conclu le juge en chef McEachern et la Cour d'appel, que le directeur avait une obligation de respecter l'équité dans la procédure en exerçant le pouvoir que lui confère l'art. 40 du Règlement à l'égard de la ségrégation ou de l'isolement administratifs. Cette Cour a confirmé que, à titre de principe général de *common law*, une obligation de respecter l'équité dans la procédure incombe à tout organisme public qui rend des décisions administratives qui ne sont pas de nature législative et qui touchent les droits, privilèges ou biens d'une personne: *Nicholson c. Haldimand-Norfolk Regional Board of Commissioners of Police*, [1979] 1 R.C.S. 311; *Martineau c. Comité de discipline de l'Institution de Matsqui (N° 2)*, [1980] 1 R.C.S. 602; *Procureur général du Canada c. Inuit Tapirisat of Canada*, [1980] 2 R.C.S. 735. Dans l'arrêt *Martineau (N° 2)*, précité, la Cour a jugé que l'obligation de respecter l'équité dans la procédure s'applique en principe aux procédures disciplinaires dans un pénitencier. Bien que la ségrégation

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Service Regulations, its effect on the inmate in either case is the same and is such as to give rise to a duty to act fairly.

The question, of course, is what the duty of procedural fairness may reasonably require of an authority in the way of specific procedural rights in a particular legislative and administrative context and what should be considered to be a breach of fairness in particular circumstances. The caution with which this question must be approached in the context of prison administration was emphasized by this Court in *Martineau (No. 2)*, *supra*. Pigeon J., with whom Martland, Ritchie, Beetz, Estey and Pratte JJ. concurred, said at p. 637:

I must, however, stress that the Order issued by Mahoney J. deals only with the jurisdiction of the Trial Division, not with the actual availability of the relief in the circumstances of the case. This is subject to the exercise of judicial discretion and in this respect it will be essential that the requirements of prison discipline be borne in mind, just as it is essential that the requirements of the effective administration of criminal justice be borne in mind when dealing with applications for *certiorari* before trial, as pointed out in *Attorney General of Quebec v. Cohen* ([1979] 2 S.C.R. 305). It is specially important that the remedy be granted only in cases of serious injustice and that proper care be taken to prevent such proceedings from being used to delay deserved punishment so long that it is made ineffective, if not altogether avoided.

Dickson J. (as he then was), with whom Laskin C.J. and McIntyre J. concurred, expressed a similar caution at p. 630 as follows:

It should be emphasized that it is not every breach of prison rules of procedure which will bring intervention by the courts. The very nature of a prison institution requires officers to make "on the spot" disciplinary decisions and the power of judicial review must be exercised with restraint. Interference will not be justified in the case of trivial or merely technical incidents. The question is not whether there has been a breach of the prison rules, but whether there has been a breach of the

administrative se distingue de la ségrégation punitive ou disciplinaire en vertu de l'art. 40 du *Règlement sur le service des pénitenciers*, l'effet sur le détenu est le même dans les deux cas et est de nature à donner lieu à une obligation d'agir avec équité.

Évidemment, il s'agit de déterminer ce que l'obligation de respecter l'équité dans la procédure peut raisonnablement exiger des autorités en tant que droit précis en matière de procédure dans un contexte législatif et administratif donné et ce qui devrait être considéré comme une violation de l'équité dans des circonstances particulières. Cette Cour a souligné, dans l'arrêt *Martineau (N° 2)*, précité, la prudence avec laquelle il faut aborder cette question dans le contexte de l'administration carcérale. Le juge Pigeon, aux motifs duquel les juges Martland, Ritchie, Beetz, Estey et Pratte ont souscrit, dit à la p. 637:

Je dois cependant souligner que l'ordonnance rendue par le juge Mahoney ne porte que sur la compétence de la Division de première instance, non sur la question de savoir si le redressement devrait être accordé dans les circonstances de l'espèce. Cela dépendra de l'exercice du pouvoir discrétionnaire judiciaire et, à cet égard, il sera essentiel de garder à l'esprit les exigences de la discipline carcérale, tout comme il est essentiel de garder à l'esprit les exigences de l'administration efficace de la justice pénale lorsqu'on traite de demandes de *certiorari* avant le procès, comme cela vient d'être souligné dans *Le procureur général de la province de Québec c. Cohen* ([1979] 2 R.C.S. 305). Il est particulièrement important de n'accorder ce redressement que dans des cas d'injustice grave et de bien veiller à ce que ces procédures ne servent pas à retarder le châtiment mérité au point de le rendre inefficace, sinon de l'éviter complètement.

Le juge Dickson (alors juge puîné) aux motifs duquel le juge en chef Laskin et le juge McIntyre ont souscrit, exprime la même mise en garde à la p. 630 dans les termes suivants:

Il faut souligner que les cours n'interviendront pas dans tous les cas de violation des règles de procédure carcérale. La nature même d'un établissement carcéral requiert que des décisions soient prises «sur-le-champ» par les fonctionnaires et le contrôle judiciaire doit être exercé avec retenue. Une intervention ne sera pas justifiée dans le cas d'incidents triviaux ou purement théoriques. Il ne s'agit pas de savoir s'il y a eu une violation des règles carcérales, mais plutôt s'il y a eu une violation

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duty to act fairly in all the circumstances. The rules are of some importance in determining this latter question, as an indication of the views of prison authorities as to the degree of procedural protection to be extended to inmates.

The same caution was emphasized by the Court of Appeal in *R. v. Hull Prison Board of Visitors, ex parte St Germain*, [1979] 1 All E.R. 701, which was referred to by Pigeon and Dickson JJ. in *Martineau (No. 2)*, *supra*, and in which Megaw L.J. said at p. 713 concerning the judicial review of prison disciplinary decisions:

> It is certainly not any breach of any procedural rule which would justify or require interference by the courts. Such interference, in my judgment, would only be required, and would only be justified, if there were some failure to act fairly, having regard to all relevant circumstances, and such unfairness could reasonably be regarded as having caused a substantial, as distinct from a trivial or merely technical, injustice which was capable of remedy.

V

Although McEachern C.J.S.C. severely criticized the imposition of administrative segregation by oral instructions that are not followed as soon as possible by written notice with reasons for the decision, he held, as I have indicated, that the original imposition of administrative segregation in this case was a lawful exercise of the Director's discretionary authority under s. 40(1) of *Penitentiary Service Regulations*, and that it was not carried out unfairly. That conclusion was not seriously challenged on the appeal, and, indeed, it would not appear to be open to challenge. Because of the apparently urgent or emergency nature of the decision to impose segregation in the particular circumstances of the case, there could be no requirement of prior notice and an opportunity to be heard before the decision.

The procedural unfairness found by McEachern C.J.S.C. was in continuing the administrative segregation of the appellants, despite the recommendation of the Segregation Review Board that they be released into the general population of the penitentiary, without giving them notice of the

de l'obligation d'agir équitablement compte tenu de toutes les circonstances. Les règles ont leur importance pour répondre à cette question: elles révèlent le degré de protection procédurale dont doivent jouir les détenus, de l'avis des autorités carcérales.

Dans l'arrêt *R. v. Hull Prison Board of Visitors, ex parte St Germain*, [1979] 1 All E.R. 701, la Cour d'appel souligne la même prudence dont les juges Pigeon et Dickson ont parlé dans l'arrêt *Martineau (N° 2)*, précité. Dans cet arrêt le lord juge Megaw dit, à la p. 713, à propos du contrôle judiciaire des décisions disciplinaires prises dans les prisons:

> [TRADUCTION] Ce ne sont certainement pas tous les manquements aux règles de procédure qui justifieront ou requerront l'intervention des cours. À mon avis, cette intervention ne sera requise et justifiée que s'il y a quelque omission d'agir équitablement, compte tenu de toutes les circonstances pertinentes, et si ce manque d'équité peut être considéré comme la cause d'une injustice importante, susceptible de redressement plutôt qu'une injustice banale ou simplement technique.

V

Bien que le juge en chef McEachern ait sévèrement critiqué l'imposition de la ségrégation administrative par instructions verbales non suivies dès que possible de la raison de la décision par écrit, il a jugé, comme je l'ai déjà indiqué, qu'en l'espèce, l'imposition de la ségrégation administrative à l'origine constituait un exercice légal du pouvoir discrétionnaire du directeur en vertu du par. 40(1) du *Règlement sur le service des pénitenciers* et qu'elle n'avait pas été faite inéquitablement. Cette conclusion n'a pas été sérieusement contestée en appel et, d'ailleurs, il ne semble pas qu'on puisse la contester. À cause de la nature apparemment pressante ou urgente de la décision d'imposer la ségrégation dans les circonstances particulières du cas, il ne pouvait y avoir d'exigence ni à l'égard d'un avis préalable ni à l'égard d'une audition préalable à la décision.

Le manque d'équité dans la procédure constaté par le juge en chef McEachern a consisté à maintenir la ségrégation administrative des appelants, malgré la recommandation du Conseil d'examen des cas de ségrégation de les réintégrer dans la population générale de l'établissement sans leur

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reasons for refusing to follow that recommendation and an opportunity to be heard, including a chance to present their side of the hostage-taking incident. McEachern C.J.S.C. also held that there was an appearance of unfairness in the apparently closed mind of the Director on the question of whether the segregation should be continued despite the favourable recommendation of the Board, and even a suggestion that the segregation was being continued in an attempt to force the appellants to plead guilty to the criminal charges pending against them. He said that the Director was required to make an independent inquiry into the circumstances of the hostage-taking incident, to examine the appellants' files and to ascertain whether the continuation of the segregation was impairing their ability to instruct counsel, as they claimed. The heart of his conclusion on the issue of procedural fairness is contained in the following statement:

> The Director had jurisdiction to disregard the recommendation of the Review Board, but to do so with fairness, it seems to me, the Petitioners ought to have been informed of the reasons of the Director for continued segregation, and they should have been given a fair opportunity to answer the case against them.

In the Court of Appeal Nemetz C.J. said that he disagreed with the opinion of McEachern C.J.S.C. that the Director had a duty to make further inquiry into the hostage-taking incident and to allow the prisoners an opportunity to be heard on their alleged involvement in the incident. After referring to the necessity, emphasized in the decision of this Court in *Inuit Tapirisat*, *supra*, of considering the legislative scheme as a whole, he said:

> This decision assists me in analyzing the case at bar. Although the director's function is essentially administrative in nature, he is given broad powers under s. 40 of the regulations. He is not burdened with any standards or guidelines in the exercise of his power to order that inmate be dissociated. Procedural standards have not been imposed or implied. He must have enough latitude to respond to the requirements of prison security as he sees fit. This is especially so in cases of violence such as hostage-taking.

communiquer les motifs du refus de suivre cette recommandation ni leur accorder d'audition comportant la possibilité de présenter leur version de la prise d'otage. Le juge en chef McEachern a également conclu qu'il y avait une apparence de manque d'équité dans l'intransigeance apparente du directeur relativement au maintien de la ségrégation malgré la recommandation favorable du Conseil et même une possibilité que le maintien de la ségrégation visât à forcer les appelants à inscrire un plaidoyer de culpabilité aux accusations criminelles portées contre eux. Il a dit que le directeur était tenu de procéder à une enquête indépendante sur les circonstances de la prise d'otage, d'examiner les dossiers des appelants et de vérifier si le maintien de la ségrégation nuisait à leur possibilité de consulter leur avocat comme ils l'ont prétendu. L'essentiel de sa conclusion sur la question de l'équité dans la procédure se trouve dans le texte suivant:

> [TRADUCTION] Le directeur avait compétence pour écarter la recommandation du Conseil d'examen, mais, pour le faire avec équité, il me semble qu'il aurait fallu que les requérants soient informés des motifs pour lesquels le directeur maintenait leur ségrégation et qu'on aurait dû leur accorder une possibilité raisonnable de contredire la preuve présentée contre eux.

En Cour d'appel, le juge en chef Nemetz a dit qu'il n'était pas de l'avis du juge en chef McEachern selon lequel le directeur avait l'obligation de procéder à un supplément d'enquête sur la prise d'otage et d'accorder aux détenus la possibilité d'être entendus à propos de leur participation à l'incident. Après avoir fait état de la nécessité, soulignée dans l'arrêt de cette Cour *Inuit Tapirisat*, précité, de considérer le plan législatif dans son ensemble, il dit:

> [TRADUCTION] Cet arrêt m'aide à analyser l'espèce. Bien que le rôle du directeur soit essentiellement de nature administrative, il a des pouvoirs étendus en vertu de l'art. 40 du Règlement. Il n'est assujetti à aucune norme ni directive dans l'exercice de son pouvoir d'ordonner la ségrégation d'un détenu. Aucune norme de procédure n'a été imposée de façon implicite ou explicite. Il doit avoir suffisamment de latitude pour satisfaire aux exigences de la sécurité de la prison selon son jugement. Cela est spécialement applicable dans les cas de violence comme une prise d'otage.

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After quoting the passages from the judgments of Pigeon and Dickson JJ. in *Martineau (No. 2)*, *supra*, which have been quoted above, concerning the caution which must be adopted towards the imposition of procedural requirements in the prison setting, Nemetz C.J.B.C. concluded on the issue of fairness as follows:

Section 40(1) gives the director a broad discretionary power. In arriving at his decision as to whether a prisoner is to be dissociated from the others in the prison, he must be satisfied that it is for the maintenance of good order and discipline *or* in the best interests of an inmate.

It is my view that his testimony shows that it was the former concern that caused him to disregard the classification board's recommendation for the month of October. Was he justified in doing so? I think he was. The seriousness of the incident and the circumstances surrounding it, as well as the situation in his prison generally, played an important part in his determination. The classification board's view related primarily to the assessment of the behaviour of the two prisoners while in dissociation. However, the director had to also consider his responsibilities in regard to the proper operation and security of the whole institution. In my view, unless mala fides or unfairness can be shown, his assessment should prevail. No mala fides has been shown. Any procedural unfairness, if it exists, is not of sufficient substance to cause me to conclude that the director acted outside of his jurisdiction.

Macdonald J.A. was of the view that there had not been a denial of procedural fairness because the appellants knew the considerations underlying the imposition and continuation of administrative segregation in their case. He said:

With great respect, I cannot find procedural unfairness in the circumstances here. The petitioners would know that they were in dissociation at Kent because of the incident at the Matsqui Institution in which they were alleged to have taken a guard hostage at knifepoint. When they first appeared before the Classification Board in July, they were expressly informed that they had been placed in dissociation because of that incident. Now, there are many factors favourable to the petitioners. They weighed with the Classification Board and resulted in the recommendation in October that they be returned to the general prison population. But they did not prevail with the director. He did not decide in accordance with the recommendation. It was not a case of a decision made under the influence, or possible

Après avoir cité les passages précités des motifs des juges Pigeon et Dickson dans l'arrêt *Martineau (N° 2)*, précité, à propos de la prudence qu'il faut exercer à l'égard de l'imposition d'exigences de procédure dans le milieu carcéral, le juge en chef Nemetz conclut comme suit sur la question de l'équité:

[TRADUCTION] Le paragraphe 40(1) confère au directeur un pouvoir discrétionnaire étendu. Pour décider de la ségrégation d'un détenu, il doit être convaincu qu'elle est nécessaire au maintien de l'ordre et de la discipline *ou* qu'elle contribue à l'intérêt d'un détenu.

J'estime que son témoignage démontre que c'est la première considération qui l'a amené à écarter la recommandation du comité de classement pour le mois d'octobre. Était-il justifié de le faire? Je crois que oui. La gravité de l'incident et les circonstances de celui-ci de même que la situation générale dans son établissement ont joué un rôle important dans sa décision. L'avis du comité de classement a surtout trait à l'évaluation de la conduite des deux détenus pendant leur ségrégation. Cependant, le directeur devait aussi tenir compte de sa responsabilité à l'égard de la bonne marche de l'établissement et de sa sécurité. À mon avis, à moins qu'il n'y ait preuve de mauvaise foi ou d'inéquité, il faut confirmer son évaluation. Il n'y a pas de preuve de mauvaise foi. S'il y a inéquité dans la procédure, elle n'a pas suffisamment d'importance pour m'amener à conclure que le directeur a excédé sa compétence.

Le juge Macdonald a été d'avis qu'il n'y avait pas eu manquement à l'équité dans la procédure parce que les appelants connaissaient les causes de l'imposition et du maintien de leur ségrégation administrative. Il dit:

[TRADUCTION] Avec égards, je ne puis conclure qu'il y a eu manquement à l'équité dans la procédure en l'espèce. Les requérants savaient qu'ils étaient en ségrégation à l'établissement Kent à cause de l'incident survenu à l'établissement de Matsqui au cours duquel ils avaient, selon les allégations, tenu un garde en otage sous la menace d'un couteau. Lorsqu'ils ont comparu devant le comité de classement en juillet, on leur a dit expressément qu'ils étaient en ségrégation à cause de cet incident. Or, il y a plusieurs facteurs en faveur des requérants. Ces facteurs ont compté auprès du comité de classement et l'ont amené, en octobre, à recommander leur réintégration dans la population carcérale générale. Ces facteurs n'ont cependant pas convaincu le directeur. Il n'a pas suivi la recommandation. Il ne s'agit pas d'une

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influence, of material unknown to the two inmates. The director was extensively cross-examined as to his reasons. He pointed out that the Classification Board was concerned with the two individuals, whereas his responsibility was the operation of the whole institution. He said that he was concerned about the seriousness of the incident in which the two men had been involved; the effect of the unresolved allegations and the situation generally on the inmate population, including the violent element; and the factor of deterrence. Weighing the factors, the director decided upon continued dissociation. I can find no procedural unfairness. I think the essence of the complaints here is with respect to the decision itself rather than the circumstances in which it was made. I am of the opinion that the director acted within his jurisdiction.

Anderson J.A., dissenting on the question of procedural fairness, expressed himself as in agreement with the reasons of McEachern C.J.S.C. After referring to the cautions expressed in *Martineau (No. 2)*, *supra*, concerning the application of procedural requirements in a prison setting, he said:

... while the procedural protection available to the respondent was limited in the way described by all members of the Supreme Court in *Martineau*, supra, I have concluded that McEachern C.J.S.C. was correct in holding that the director did not observe even the most minimal standards of procedural fairness. While the respondent was not entitled to a full hearing or to confront witnesses or to counsel, at the very least he ought to have been given an opportunity to make representations as to why he should no longer be kept in solitary confinement. I cannot do better than repeat what McEachern C.J.S.C. said in his reasons for judgment in respect of this issue:

> "The director had jurisdiction to disregard the recommendation of the review board, but to do so with fairness, it seems to me, the petitioners ought to have been informed of the reasons of the director for continued segregation, and they should have been given a fair opportunity to answer the case against them. They should not have had to make out their case to a mind that was closed or almost closed against them. To continue their segregation in the face of the recommendation of the review board in the particular circumstances of this case raises a reasonable apprehension that they should plead guilty which, by itself is enough to cast a pervasive appearance of unfairness over these cases. In addition,

décision prise sous l'influence réelle ou possible d'éléments inconnus des deux détenus. Le directeur a subi un contre-interrogatoire exhaustif quant à ses motifs. Il a souligné que le comité de classement se préoccupait des deux personnes alors que sa responsabilité portait sur le fonctionnement de l'ensemble de l'établissement. Il a dit qu'il a tenu compte de la gravité de l'incident auquel les deux hommes avaient été mêlés, des conséquences des allégations pendantes et de l'effet général sur la population carcérale, notamment le groupe d'endurcis et du facteur de dissuasion. Tenant compte de ces facteurs, le directeur a décidé de maintenir la ségrégation. Je ne puis voir de manquement à l'équité dans la procédure. Je crois que la contestation porte essentiellement en l'espèce sur la décision elle-même plutôt que sur les circonstances dans lesquelles elle a été prise. Je suis d'avis que le directeur a agi dans le cadre de sa compétence.

Le juge Anderson qui a été dissident sur la question de l'équité dans la procédure s'est dit d'accord avec les motifs du juge en chef McEachern. Après avoir mentionné les mises en garde exprimées dans l'arrêt *Martineau (N° 2)*, précité, au sujet de l'application des exigences de la procédure en milieu carcéral, il dit:

[TRADUCTION] ... quoique la protection en matière de procédure dont jouit l'intimé fût limitée de la façon décrite par tous les juges de la Cour suprême dans l'arrêt *Martineau*, précité, j'estime que le juge en chef McEachern a eu raison de conclure que le directeur n'a même pas observé les normes les moins exigeantes d'équité dans la procédure. Bien que l'intimé n'ait droit ni à une audition complète, ni de contredire les témoins, ni à un avocat, il aurait dû avoir au moins la possibilité de faire valoir pourquoi il devrait sortir de l'isolement cellulaire. Je ne puis faire mieux que répéter ce que le juge en chef McEachern a dit dans ses motifs de jugement quant à cette question:

> «Le directeur avait compétence pour écarter la recommandation du Conseil d'examen, mais, pour le faire avec équité, il me semble qu'il aurait fallu que les requérants soient informés des motifs pour lesquels le directeur maintenait leur ségrégation et qu'on aurait dû leur accorder une possibilité raisonnable de contredire la preuve présentée contre eux. Ils n'auraient pas dû être obligés de présenter leur cas à quelqu'un dont l'idée était déjà arrêtée ou presque. Maintenir leur ségrégation après la recommandation du Conseil d'examen dans les circonstances de l'espèce soulève une crainte raisonnable qu'ils doivent plaider coupable, ce qui, en soi, suffit à donner une forte apparence de manque d'équité en l'espèce. De

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although a decision based upon a policy (such as one for prisoners who are awaiting trial or for prisoners who have taken a hostage) may be perfectly lawful, fairness requires timely reconsideration of the particular circumstances of each prisoner and individual whose residual rights and privileges are adversely being affected."

plus, bien qu'une décision fondée sur une politique (telle celle qui s'applique aux détenus qui attendent leur procès ou aux détenus qui ont participé à une prise d'otage) puisse être parfaitement légale, l'équité exige la reconsidération au moment opportun de la situation particulière de chaque détenu et des personnes dont les droits et privilèges résiduels sont défavorablement touchés.»

VI

VI

The issue then is what did procedural fairness require of the Director in exercising his authority, pursuant to s. 40 of the *Penitentiary Service Regulations*, to continue the administrative dissociation or segregation of the appellants, despite the recommendation of the Board, if he was satisfied that it was necessary or desirable for the maintenance of good order and discipline in the institution. I agree with McEachern C.J.S.C. and Anderson J.A. that because of the serious effect of the Director's decision on the appellants, procedural fairness required that he inform them of the reasons for his intended decision and give them an opportunity, however informal, to make representations to him concerning these reasons and the general question whether it was necessary or desirable to continue their segregation for the maintenance of good order and discipline in the institution. With great respect, I do not think it is an answer to the requirement of notice and hearing by the Director, as suggested by Macdonald J.A., that the appellants knew as a result of their appearance before the Segregation Review Board why they had been placed in segregation. They were entitled to know why the Director did not intend to act in accordance with the recommendation of the Board and to have an opportunity before him to state their case for release into the general population of the institution. I do not think the Director was required to make an independent inquiry into the alleged involvement of the appellants in the hostage-taking incident. He could rely on the information he had received concerning the incident from the warden of Matsqui Institution and the personnel at regional headquarters. At the same time, he had a duty to hear and consider what the appellants had to say concerning their alleged involvement in the incident, as well as anything else that could be relevant to the question

La question est donc de savoir ce que l'équité dans la procédure exigeait du directeur dans l'exercice de son pouvoir, en application de l'art. 40 du *Règlement sur le service des pénitenciers*, de maintenir la ségrégation ou l'isolement administratifs des appelants, malgré la recommandation du Conseil, s'il était convaincu qu'elle était nécessaire ou souhaitable pour le maintien du bon ordre et de la discipline dans l'établissement. Je suis d'accord avec le juge en chef McEachern et le juge Anderson de la Cour d'appel qu'à cause des effets graves de la décision du directeur pour les appelants, l'équité dans la procédure exigeait qu'il leur fasse connaître les motifs de sa décision prochaine et leur donne la possibilité, même de façon informelle, de lui présenter des arguments relatifs à ces motifs et à la question générale de savoir s'il était nécessaire ou souhaitable de maintenir leur ségrégation pour assurer l'ordre et la discipline dans l'établissement. Avec égards, je ne crois pas que l'on ait satisfait à l'exigence d'avis et d'audition incombant au directeur, comme le suggère le juge Macdonald, parce que les appelants savaient par suite de leur comparution devant le Conseil d'examen des cas de ségrégation pourquoi ils avaient été mis en ségrégation. Ils avaient le droit de savoir pourquoi le directeur n'avait pas l'intention de suivre la recommandation du Conseil et d'avoir la possibilité d'exposer devant lui leurs arguments en faveur de leur réintégration dans la population générale de l'établissement. Je ne crois pas que le directeur ait eu l'obligation de tenir une enquête indépendante sur la participation des appelants à la prise d'otage. Il pouvait se fier aux renseignements relatifs à l'incident qui lui avaient été communiqués par le directeur de l'établissement de Matsqui et le personnel du bureau central régional. En même temps, il avait l'obligation d'entendre les appelants et de tenir compte de ce qu'ils

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whether their release from segregation might introduce an unsettling element into the general inmate population and thus have an adverse effect on the maintenance of good order and discipline in the institution.

These were in my opinion the minimal or essential requirements of procedural fairness in the circumstances, and they are fully compatible with the concern that the process of prison administration, because of its special nature and exigencies, should not be unduly burdened or obstructed by the imposition of unreasonable or inappropriate procedural requirements. There is nothing to suggest that the requirement of notice and hearing by the Director, where he does not intend to act in accordance with a recommendation by the Segregation Review Board for the release of an inmate from segregation, would impose an undue burden on prison administration or create a risk to security.

There is the question, suggested by the reasons for judgment of Nemetz C.J.B.C., whether the breach of the duty to act fairly in this case should be held not to have resulted in an excess or loss of jurisdiction and to have made the continuing segregation of the appellants unlawful because, having regard to the merits of the substantive issue, it did not result in a substantial injustice, or to use the words of Nemetz C.J.B.C., was not of "sufficient substance". Both Nemetz C.J.B.C. and Macdonald J.A. considered the substantive issue of whether the appellants should be released from segregation and appeared to conclude that the Director's reasons for refusing to follow the recommendation of the Segregation Review Board were reasonable and fair. It is a possible implication of their approach that they were of the view that given the Director's reasons for refusing to follow the recommendation of the Board a hearing by him of the appellants would not serve any useful purpose. Certainly a failure to afford a fair hearing, which is the very essence of the duty to act fairly, can never of itself be regarded as not of "sufficient substance" unless it be because of its

avaient à dire à propos de leur participation alléguée à l'incident, de même que de tout autre sujet qui pouvait avoir trait à la question de savoir si la levée de leur ségrégation pouvait introduire un élément perturbateur dans la population carcérale générale et avoir ainsi des conséquences néfastes sur le maintien de l'ordre et de la discipline dans l'établissement.

Ce sont là, à mon avis, les exigences minimales ou essentielles de l'équité dans la procédure dans les circonstances et elles sont tout à fait compatibles avec le souci de ne pas indûment alourdir ou bloquer le processus de l'administration carcérale, vu sa nature et ses besoins spéciaux, par l'imposition d'exigences de procédure déraisonnables ou impropres. Rien n'indique que l'obligation du directeur en matière d'avis et d'audition, lorsqu'il n'entend pas donner suite à une recommandation d'un Conseil d'examen des cas de ségrégation de lever la ségrégation d'un détenu, imposerait un fardeau excessif à l'administration carcérale ou mettrait la sécurité en danger.

Il reste la question évoquée dans les motifs de jugement du juge en chef Nemetz, savoir s'il faut conclure que la violation de l'obligation d'agir avec équité en l'espèce n'a pas entraîné d'excès ou de perte de compétence ni rendu illégal le maintien de la ségrégation des appelants parce que, compte tenu du bien-fondé de la question de fond, elle n'a pas entraîné d'injustice importante ou, selon les mots mêmes du juge en chef Nemetz, elle était sans [TRADUCTION] «importance suffisante». Le juge en chef Nemetz et le juge Macdonald ont étudié la question de fond de savoir s'il y avait lieu de lever la ségrégation des appelants et ont paru conclure que les motifs du refus du directeur de suivre la recommandation du Conseil d'examen des cas de ségrégation étaient justes et raisonnables. Une implication possible de leur analyse est qu'ils ont estimé que, vu les motifs du refus du directeur de suivre la recommandation du Conseil, il aurait été inutile qu'il accorde une audition aux appelants. L'omission d'accorder une audition équitable, qui est de l'essence même de l'obligation d'agir avec équité, ne peut jamais être considérée en elle-même sans «importance suffisante» à moins

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perceived effect on the result or, in other words, the actual prejudice caused by it. If this be a correct view of the implications of the approach of the majority of the British Columbia Court of Appeal to the issue of procedural fairness in this case, I find it necessary to affirm that the denial of a right to a fair hearing must always render a decision invalid, whether or not it may appear to a reviewing court that the hearing would likely have resulted in a different decision. The right to a fair hearing must be regarded as an independent, unqualified right which finds its essential justification in the sense of procedural justice which any person affected by an administrative decision is entitled to have. It is not for a court to deny that right and sense of justice on the basis of speculation as to what the result might have been had there been a hearing.

For these reasons I am of the opinion that by his failure to afford the appellants a fair hearing on the question whether he should act in accordance with the recommendation of the Segregation Review Board that they be released from administrative segregation into the general population of the institution, the Director rendered the continued segregation of the appellants unlawful. They, therefore, had a right on *habeas corpus* to be released from administrative dissociation or segregation into the general population of the penitentiary. I would accordingly allow the appeal, set aside the judgment of the Court of Appeal and restore the judgment of McEachern C.J.S.C.

Appeal allowed.

Solicitor for the appellants: John W. Conroy, Abbotsford.

Solicitor for the respondent: Roger Tassé, Ottawa.

que ce ne soit à cause de son effet perçu sur le résultat ou, en d'autres mots, à cause du tort réel qu'elle a causé. Si c'est là la façon correcte de voir les implications de l'analyse adoptée par la majorité de la Cour d'appel de la Colombie-Britannique sur la question d'équité dans la procédure en l'espèce, j'estime nécessaire d'affirmer que la négation du droit à une audition équitable doit toujours rendre une décision invalide, que la cour qui exerce le contrôle considère ou non que l'audition aurait vraisemblablement amené une décision différente. Il faut considérer le droit à une audition équitable comme un droit distinct et absolu qui trouve sa justification essentielle dans le sens de la justice en matière de procédure à laquelle toute personne touchée par une décision administrative a droit. Il n'appartient pas aux tribunaux de refuser ce droit et ce sens de la justice en fonction d'hypothèses sur ce qu'aurait pu être le résultat de l'audition.

Pour ces motifs, je suis d'avis qu'en omettant d'offrir aux appelants une audition équitable sur la question de savoir s'il devrait suivre la recommandation du Conseil d'examen des cas de ségrégation de lever leur ségrégation administrative et de les réintégrer dans la population générale de l'établissement, le directeur a rendu illégal le maintien de la ségrégation des appellants. Ils avaient donc droit, en vertu d'un bref d'*habeas corpus*, à la levée de leur ségrégation ou isolement administratifs et à leur réintégration dans la population générale du pénitencier. En conséquence je suis d'avis d'accueillir le pourvoi, d'infirmer l'arrêt de la Cour d'appel et de rétablir le jugement du juge en chef McEachern de la Cour suprême.

Pourvoi accueilli.

Procureur des appelants: John W. Conroy, Abbotsford.

Procureur de l'intimé: Roger Tassé, Ottawa.

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Long	Lat	Stn_Name	Clim_ID	Prov_or_Te	Tm	DwTm	D	Tx	DwTx	Tn	DwTn	S	DwS	S%N	P	DwP	P%N	S_G	Pd	BS	DwBS	BS%	HDD	CDD
-124.052	48.829	LAKE COWICHAN	1012055	BC	4	19	1.5	11	14	-2	14	0	14	NA	262	14	NA	0	10		NA	167.5	0
-123.226	48.425	DISCOVERY ISLAND	1012475	BC	7.9	1	NA	12.1	1	3	1			NA			NA				NA	303.7	0
-123.439	48.432	ESQUIMALT HARBOUR	1012710	BC	7.2	0	NA	12.2	0	2.7	0			NA	122	0	NA		17		NA	336	0
-123.53	48.575	MALAHAT	1014820	BC	4.7	0	NA	10	0	0.1	0			NA	0.6	1	NA		0		NA	412.9	0
-123.561	48.374	METCHOSIN	1015105	BC			NA					0	6	NA	169.6	6	NA	0	19		NA		
-123.718	48.824	NORTH COWICHAN	1015628	BC			NA					0	0	0	226.4	0	128	0	22		NA		
-123.719	48.824	NORTH COWICHAN	1015630	BC	5.6	2	NA	13.1	2	-1.7	2			NA	212	2	NA		19		NA	359.4	0
-123.287	48.764	NORTH PENDER ISLAND	1015638	BC	6.5	0	NA	12	0	1.5	0	0	0	NA	152	0	NA	0	17		NA	356.5	0
-123.531	48.298	RACE ROCKS	1016640	BC	7.8	0	NA	12.7	0	4.3	0			NA			NA				NA	317.6	0
-123.419	48.622	SAANICHTON CFIA	1016943	BC	6.5	0	NA	12.6	0	1.3	0			NA	145.6	0	NA		18		NA	355.5	0
-123.427	48.598	SAANICHTON MT NEWTON	1016RM0	BC			NA					0	0	0	172.2	0	117	0	20		NA		
-123.128	48.775	SATURNA CAPMON CS	1017099	BC	5.8	0	NA	10.5	0	1.4	0			NA	149.6	0	NA		19		NA	378.5	0
-123.045	48.784	SATURNA ISLAND CS	1017101	BC	7.9	0	NA	12.5	0	3.5	0			NA	108	0	NA		20		NA	314.1	0
-123.921	48.377	SHERINGHAM POINT	1017254	BC	7.9	0	NA	16.1	0	3.4	0			NA	259.4	0	NA		22		NA	311.6	0
-123.305	48.457	VICTORIA UNIVERSITY CS	1018598	BC	6.7	3	NA	11.6	3	1.9	3			NA	121.9	3	NA		18		NA	316.4	0
-123.325	48.413	VICTORIA GONZALES CS	1018611	BC	7.1	0	NA	11.2	0	3.2	0			NA	93	0	NA		15		NA	338.7	0
-123.426	48.647	VICTORIA INTL A	1018621	BC	5.9	1	NA	13.2	1	-0.5	1	0	0	NA	151	0	NA		19		NA	361.6	0
-123.388	48.423	VICTORIA HARBOUR A	1018633	BC	7.3	0	NA	12	0	2.2	0			NA			NA				NA	331.4	0
-124.16	49.35	BALLENAS ISLAND	1020590	BC	7.4	1	NA	13.4	1	3.2	1			NA	102.8	1	NA		18		NA	318.3	0
-125.273	49.952	CAMPBELL RIVER A	1021261	BC	4.6	0	2.5	12	0	-3	0	0	0	0	298.4	0	132	0	25		NA	416.5	0
-125.273	49.952	CAMPBELL RIVER A	1021270	BC	4.4	0	NA	11.8	0	-3	0			NA			NA				NA	422.1	0
-125.195	49.998	CAPE MUDGE	1021330	BC	6.9	1	3.1	12	1	1	1	0	1	NA	250.8	1	NA	0	24		NA	334.5	0
-124.9	49.717	COMOX A	1021830	BC	6.1	0	2.6	12.9	0	-0.6	0	0	0	0	239	0	127		20		NA	370.2	0
-124.999	49.763	COURTENAY GRANTHAM	1021988	BC	5.7	13	NA	12	13	0	13	0	13	NA	228.6	13	NA	0	11		NA	221	0
-125.033	49.686	COURTENAY PUNTLEDGE	1021989	BC	5.2	4	NA	12.5	2	-1	2	0	2	NA	267.4	2	NA	0	19		NA	345.9	0
-123.811	49.209	ENTRANCE ISLAND	1022689	BC	7.6	4	NA	13.2	4	4	4			NA	85	4	NA		14		NA	281.9	0
-125.993	50.454	FANNY ISLAND	1022795	BC	6.9	1	NA	11.3	1	3.2	1			NA	184.8	1	NA		20		NA	332.7	0
-123.87	49.054	NANAIMO A	1025365	BC	4.8	0	NA	13.2	0	-1.9	0			NA			NA				NA	410.6	0
-123.988	49.199	NANAIMO CITY YARD	10253G0	BC			NA					0	0	0	252.8	0	143	0	20		NA		
-127.367	50.681	PORT HARDY A	1026271	BC	5.7	0	NA	11.3	0	-2.2	0	0	0	NA	160.7	0	NA		18		NA	380.3	0
-127.377	50.684	PORT HARDY AIRPORT	1026273	BC	5.9	0	NA	11.4	0	-1.3	0			NA	188.2	0	NA		18		NA	374.2	0
-124.394	49.337	QUALICUM BEACH AIRPORT	1026562	BC	5.4	1	NA	13.1	1	-1.2	1			NA	95.2	1	NA		17		NA	378	0
-124.617	49.394	QUALICUM R FISH RESEARCH	1026565	BC	6.3	0	2.9	13	0	-1	0	0	0	0	169.6	0	89	0	20		NA	362.2	0
-125.304	50.016	QUINSAM RIVER HATCHERY	1026639	BC	5.4	0	2.8	12	0	-1.5	0	0	0	0	321.8	0	128	0	26		NA	391.8	0
-124.435	49.487	SISTERS ISLAND	1027403	BC	8	6	NA	12.7	6	3.8	6			NA			NA				NA	249.6	0
-123.809	49.209	ENTRANCE ISLAND	102BFHH	BC	7.7	1	NA	13	1	4	1	0	1	NA	151	1	NA	0	19		NA	308.8	0
-124.982	49.337	ALBERNI ROBERTSON CREEK	1030230	BC	4.5	0	2.7	10	0	0	0	0	0	0	342	0	99	0	23		NA	418.1	0
-125.216	48.786	CAPE BEALE LIGHT	1031316	BC	7.9	0	2	12	0	3	0	0	0	0	414.4	0	108	0	22		NA	314.4	0
-128.427	50.782	CAPE SCOTT	1031353	BC	7.4	0	1.8	13	0	2	0	0	0	0	309.6	0	94	0	27		NA	327.6	0
-126.543	49.383	ESTEVAN POINT	1032730	BC	8.1	0	2.4	14	0	2.5	0	0	0	0	418	0	97	0	21		NA	307	0
-126.543	49.383	ESTEVAN POINT CS	1032731	BC	7.4	0	NA	13.8	0	2.3	0			NA	401.7	0	NA		22		NA	329.8	0
-125.923	49.111	LENNARD ISLAND	1034600	BC	7.2	0	NA	16	0	1	0	0	0	0	440.8	0	104	0	24		NA	336	0
-124.655	48.859	NITINAT RIVER HATCHERY	1035612	BC	5.5	0	2.2	13.5	0	-1	0	0	0	0	556.6	0	113	0	22		NA	386.8	0
-126.617	49.6	NOOTKA LIGHTSTATION	1035614	BC	6.8	23	1.4	11	23	3	0	0	0	0	388.6	0	91	0	22		NA	89.8	0
-127.653	50.534	QUATSINO	1036570	BC	6.1	4	2.1	11	4	0.5	4	0	4	NA	254.4	4	NA	0	19		NA	320.9	0
-128.033	50.441	QUATSINO LIGHTSTATION	1036572	BC	8.5	0	2.8	18	0	3	0	0	0	0	263.6	0	78	0	21		NA	293.3	0
-124.927	49.317	PORT ALBERNI (AUT)	1036B06	BC	4.2	0	NA	11.7	0	-0.7	0			NA	298.2	0	NA	0	21		NA	426.4	0
-128.908	50.821	SARTINE ISLAND (AUT)	1037090	BC	7.7	2	NA	13.1	2	3.9	2			NA	112.2	2	NA		15		NA	297.6	0
-127.94	50.112	SOLANDER ISLAND (AUT)	1037553	BC	8.1	0	NA	15.9	0	3.4	0			NA	166.2	0	NA		22		NA	308.1	0
-126.654	49.932	TAHSIS VILLAGE NORTH	1037899	BC	6.3	16	NA	13	16	0	16			NA	267.8	21	NA		10		NA	175.1	0
-125.773	49.082	TOFINO A	1038210	BC	7.1	1	NA	16.5	1	0.5	1			NA			NA				NA	326.6	0
-125.527	48.945	UCLUELET KENNEDY CAMP	1038332	BC	7.5	0	1.9	16.5	0	0.5	0	0	0	0	438.4	0	97	0	21		NA	326.9	0
-126.779	50.053	ZEBALLOS MURAUDE CREEK	1039035	BC	5.1	1	NA	13	1	-1.5	1	0	1	NA	534.4	1	NA	0	19		NA	386.7	0
-123.402	49.36	BOWEN ISLAND SUNSET PARK	104091B	BC			NA					0	0	NA	276.6	0	NA	0	22		NA		
-123.541	49.386	GIBSONS GOWER POINT	1043152	BC	6.9	0	2.7	14.5	0	2	0	0	0	0	210.6	0	118	0	19		NA	345.3	0
-123.913	49.468	MERRY ISLAND LIGHTSTATION	1045100	BC	7.5	0	2.3	14.5	0	3	0	0	0	0	135.2	0	100	0	19		NA	326.7	0
-123.299	49.488	HOWE SOUND - PAM ROCKS	10459NN	BC	7	2	NA	12.1	2	3.5	2			NA	190.4	2	NA		18		NA	319.3	0
-124.032	49.634	PENDER HARBOUR	1046115	BC			NA					0	0	NA	151.4	0	NA	0	21		NA		
-123.496	49.526	PORT MELLON	1046332	BC	5.8	1	NA	12.6	1	0.6	1			NA	389.9	1	NA		21		NA	367.1	0
-124.5	49.834	POWELL RIVER A	1046391	BC	5.4	0	2.3	12	0	-1.5	0	0	0	0	157.6	0	100	0	19		NA	390	0
-124.497	49.835	POWELL RIVER	1046392	BC	5.4	0	NA	12.7	0	-1.5	0			NA	178.7	0	NA	0	20		NA	392	0
-124.5	49.834	POWELL RIVER A	1046396	BC	5.2	0	NA	11.9	0	-1.9	0			NA			NA				NA	397.7	0
-123.715	49.458	SECHELT AUT	1047172	BC	5.9	1	NA	15.5	1	-1.4	1			NA	132.4	1	NA	0	16		NA	364.1	0
-123.161	49.783	SQUAMISH AIRPORT	10476F0	BC	3.8	0	NA	10.6	0	-2.3	0			NA	401.9	0	NA		21		NA	439	0
-131.016	51.936	CAPE ST JAMES	1051351	BC	6.9	4	NA	10.9	4	4.2	4			NA	274.6	4	NA		23		NA	299.1	0
-132.772	53.316	KINDAKUN ROCKS (AUT)	1054222	BC	8	0	NA	13.9	0	2.8	0			NA	204.2	0	NA		22		NA	310.9	0
-133.058	54.255	LANGARA	1054500	BC	6.3	0	2	13	0	1.5	0	0	0	0	170.8	0	77	0	24		NA	362.1	0

-133.058	54.255	LANGARA ISLAND RCS	1054503	BC	6.5	1	NA		12.8	1	2.7	1			NA		161.6	1	NA			22		NA	345	0
-132.125	54.027	MASSET A	1054929	BC	5.7	1	NA		11.3	1	-4.8	1			NA				NA					NA	368.4	0
-131.661	54.159	ROSE SPIT (AUT)	1056869	BC	6.3	0	NA		9.7	0	-1.9	0			NA		512.8	0	NA			26		NA	363.1	0
-131.813	53.249	SANDSPIT AIRPORT AUTO	1057051	BC	6.6	0	NA		12.7	0	-2.3	0			NA		184.8	0	NA			21		NA	352	0
-131.814	53.254	SANDSPIT	1057052	BC	6.7	0	NA		12.6	0	-1.1	0			NA		235.3	0	NA			21		NA	350.5	0
-127.864	51.604	ADDENBROKE ISLAND	1060080	BC	7.6	0		2.9	17.5	0	1.5	0	0	0		0	303.2	0		83	0	22		NA	322.1	0
-128.157	52.185	BELLA BELLA	1060815	BC	5.8	1	NA		14.5	1	-3.2	1			NA		294.8	0	NA			23		NA	366.3	0
-126.587	52.389	BELLA COOLA AIRPORT	1060844	BC	3	0	NA		10.6	0	-4	0			NA		104.5	0	NA		0	15		NA	465.5	0
-126.596	52.388	BELLA COOLA A	1060848	BC	3.1	0	NA		10.7	0	-4.3	0			NA				NA					NA	462.8	0
-128.524	52.643	BOAT BLUFF	1060901	BC	6.5	0		3	12	0	1	0	0	0		0	609.4	0		97	0	24		NA	355.3	0
-130.638	53.493	BONILLA ISLAND	1060902	BC	8	0		2.7	16	0	3	0	0	0		0	420.2	0		155	0	25		NA	309.7	0
-130.639	53.493	BONILLA ISLAND (AUT)	1060R0K	BC	7.4	9	NA		15.1	9	2.9	9			NA		149.6	13	NA			13		NA	232.9	0
-127.471	52.187	CATHEDRAL POINT (AUT)	1061458	BC	5.5	0	NA		11.1	0	1	0			NA		246.4	0	NA			23		NA	387.4	0
-131.602	53.03	CUMSHEWA ISLAND	1062251	BC	7.9	0	NA		13.1	0	2.2	0			NA		201.6	0	NA			12		NA	313.8	0
-128.112	52.185	DRYAD POINT	1062544	BC	7.1	0		2.7	15	0	1.5	0	0	0		0	255.2	0		93	0	24		NA	337.3	0
-127.835	51.247	EGG ISLAND	1062646	BC	6.8	0		2.2	15.5	0	1	0	0	0		0	263.6	0		83	0	21		NA	345.9	0
-130.708	54.569	GREEN ISLAND	1063298	BC	5.5	0		1.6	10	0	0	0	0	0		0	311.4	0		115	0	21		NA	388.3	0
-130.698	54.58	GREY ISLET (AUT)	1063303	BC	6.2	2	NA		10.9	2	0.6	2			NA		272.6	2	NA			20		NA	343.6	0
-127.632	50.94	HERBERT ISLAND (AUT)	1063461	BC	7.6	0	NA		13.4	0	4.8	0			NA		154.4	0	NA			18		NA	322.6	0
-130.361	54.172	HOLLAND ROCK	1063496	BC	7	1	NA		13.2	1	1.6	1			NA		132	1	NA			18		NA	330.7	0
-128.407	52.27	IVORY ISLAND	1063690	BC	7.2	0		2.3	14	0	2.5	0	0	0		0	330	0		101	0	23		NA	335.3	0
-127.943	53.563	KEMANO	1064020	BC	1.8	2		2.6	5	1	-3.5	1	16.8	1	NA		204.6	1	NA		0	21		NA	469.7	0
-128.634	54.054	KITIMAT FOREST AVE	1064324	BC	1.2	1	NA		7.8	1	-5.5	1			NA		213.1	1	NA		13	18		NA	504.6	0
-130.609	54.296	LUCY ISLAND LIGHTSTATION	1064728	BC	7	0	NA		14	0	1.9	0			NA				NA					NA	341.8	0
-128.719	52.262	MCINNES ISLAND	1065010	BC	7	1		2	12	1	3	1	0	1	NA		239.6	1	NA		0	22		NA	328.7	0
-130.445	54.286	PRINCE RUPERT	1066482	BC	5.6	0	NA		14.8	0	-5.1	0			NA		336	0	NA			23		NA	384.3	0
-130.29	54.32	PRINCE RUPERT MONT CIRC	1066488	BC			NA						0	28	NA		132	28	NA			3		NA		
-129.983	55.933	STEWART A	1067748	BC	-1	0	NA		5.9	0	-12.6	0			NA				NA					NA	587.9	0
-128.625	54.502	TERRACE PCC	1068131	BC	1.4	6		2.7	6	6	-5	6	17.2	6	NA		63.2	6	NA		0	14		NA	416	0
-128.578	54.469	TERRACE A	1068134	BC	0.8	1	NA		7.5	1	-6.2	1	15	1	NA		71.9	1	NA		1	16		NA	514.7	0
-130.88	54.295	TRIPLE ISLAND	1068250	BC	7.1	0	NA		11.5	0	2	0	0	0	NA		114.8	0	NA		0	20		NA	336.7	0
-126.277	54.199	EQUITY SILVER	1072692	BC	-5	21		2.5	4.5	21	-20	21	15.4	21	NA		18.6	21	NA			6		NA	230.3	0
-126.668	54.396	HOUSTON	1073615	BC	-3	23	NA		5	23	-11	23	7	23	NA		7	23	NA			2		NA	167.7	0
-127.183	54.825	SMITHERS	1077499	BC	-2.2	1	NA		5.4	1	-11	1			NA		19.7	1	NA			6		NA	606.3	0
-127.189	54.824	SMITHERS AIRPORT AUTO	1077501	BC	-2.4	1	NA		5	1	-11.1	1			NA		35.9	1	NA		20	12		NA	612.5	0
-127.171	55.289	SUSKWA VALLEY	107G879	BC	-1.7	2		3.4	3	2	-10.5	2	25.2	2	NA		41.8	2	NA		20	13		NA	572.2	0
-125.997	53.772	OOTSA LAKESKINS LAKE CLIMATE	1085836	BC	-2.1	0	NA		7.7	0	-11.1	0			NA		38.1	0	NA		14	8		NA	622.1	0
-122.738	50.302	PEMBERTON AIRPORT (WIND)	1086081	BC	0.8	0	NA		7.7	0	-4.2	0			NA				NA					NA	533.9	0
-122.734	50.306	PEMBERTON AIRPORT CS	1086082	BC	0.8	1	NA		6.5	1	-3.8	1			NA		132.8	1	NA		2	15		NA	514.6	0
-124.136	52.114	PUNTZI MOUNTAIN (AUT)	1086558	BC	-5.5	0	NA		6.6	0	-19.3	0			NA		19.1	1	NA		8	5		NA	729	0
-124.403	51.675	TATLAYOKO LAKE RCS	1088015	BC	-1.4	0	NA		10.6	0	-17.1	0			NA		18	0	NA		1	5		NA	601.5	0
-121.515	53.069	BARKERVILLE	1090660	BC	-4.7	5		3	5	5	-24	5	58	5	NA		99.8	5	NA			12		NA	590.7	0
-125.959	54.383	BURNS LAKE DECKER LAKE	1091174	BC	-3.9	0	NA		5.2	0	-14	0			NA		45.1	0	NA		23	10		NA	678.9	0
-124.286	54.455	FORT ST JAMES AUTO	1092975	BC	-2.6	1	NA		5.2	1	-14.2	1			NA		60.9	1	NA		24	9		NA	616.5	0
-124.293	54.459	FORT ST JAMES GOLF CLUB	1092977	BC	-2.2	0	NA		5.3	0	-13.5	0			NA		77.5	0	NA		22	11		NA	626.7	0
-122.699	53.531	HIXON	1093474	BC	-5.3	30		0.5	1	30	-11.5	30	1.4	30	NA		1.4	30	NA			1		NA	23.3	0
-122.286	52.531	MCLEESE LAKE GRANITE MT	1095018	BC	-2.3	18	NA		5	13	-12	13	25	13	NA		46	13	NA		24	4		NA	264.4	0
-122.678	53.884	PRINCE GEORGE	1096439	BC	-2.3	1	NA		6.3	1	-16.2	1			NA		93.4	1	NA			11		NA	608.3	0
-122.672	53.889	PRINCE GEORGE AIRPORT AUTO	1096453	BC	-1.9	1	NA		6.4	1	-13.5	1			NA		89.1	1	NA		14	12		NA	598	0
-122.791	53.9	PRINCE GEORGE MASSEY AUTO	1096454	BC	-1.2	2	NA		7.6	2	-11.7	2			NA		115.4	2	NA		16	13		NA	555.6	0
-122.51	53.026	QUESNEL	1096629	BC	-0.9	0	NA		8.1	0	-9	0			NA		9	20	NA			1		NA	585.1	0
-122.506	53.027	QUESNEL AIRPORT AUTO	1096631	BC	-0.8	0	NA		8.2	0	-9	0			NA		74.1	0	NA		4	11		NA	582.2	0
-121.686	52.184	SPOKIN LAKE 4E	1097646	BC	-1.8	6		5.9	6	6	-18	6	38	6	NA		40	6	NA		20	7		NA	494.7	0
-122.054	52.183	WILLIAMS LAKE A	1098941	BC	-1.6	1	NA		4.6	1	-10.1	1	24.9	0	NA		27.4	0	NA		10	6		NA	588.8	0
-122.36	49.025	ABBOTSFORD A	1100031	BC	5.6	3	NA		13.1	3	-3.1	3	0	2	NA		211.8	2	NA			19		NA	348.4	0
-122.36	49.025	ABBOTSFORD A	1100032	BC	5.5	1	NA		13.1	1	-3.1	1			NA				NA					NA	376.3	0
-121.76	49.243	AGASSIZ RCS	1100119	BC	6.2	1		2.6	11.7	1	0.9	1			NA		215.2	1	NA		0	21		NA	354.4	0
-122.955	50.129	WHISTLER - NESTERS	1100875	BC	0.6	0	NA		6.2	0	-5.1	0			NA		177.4	0	NA		34	18		NA	539.6	0
-123.008	49.073	VANCOUVER BOUNDARY BAY	1100909	BC	5.7	2	NA		12	2	-2.1	2			NA				NA					NA	356	0
-123.111	50.144	CALLAGHAN VALLEY	1101300	BC	0.4	0	NA		5.5	0	-6.5	0			NA		335.3	0	NA		82	20		NA	544.8	0
-121.97	49.106	CHILLIWACK SOUTH	1101571	BC	6.2	0	NA		12.5	0	-0.5	0	0	0	NA		193.6	0	NA		0	18		NA	364.3	0
-122.698	49.109	CLOVERDALE EAST	1101708	BC	6.1	0	NA		12	0	-1.5	0	0	0	NA		211.4	0	NA		0	18		NA	370.1	0
-121.979	49.079	CULTUS LAKE	1102221	BC	4.8	0	NA		11	0	-1.8	0			NA		200	7	NA			19		NA	409.7	0
-123.002	49.126	DELTA BURNS BOG	1102415	BC	5.1	0	NA		12.6	0	-2.8	0			NA		220.8	0	NA			20		NA	401.2	0
-123.093	49.011	DELTA TSAWWASSEN BEACH	1102425	BC							2	1	0	1	NA		203.4	1	NA		0	18		NA		
-122.551	49.145	FORT LANGLEY TELEGRAPH TRAIL	1102912	BC	6	2	NA		12	2	-2	2	0	2	NA		239.6	2	NA		0	18		NA	348.8	0
-122.573	49.264	HANEY UBC RF ADMIN	1103332	BC	5.9	1		3.3	15	1	-0.5	1	0	1	NA		332.2	1	NA		0	19		NA	362.3	0
-122.631	49.101	LANGLEY REGIONAL	1104570	BC	5.1	2	NA		13	2	-3.1	2			NA				NA					NA	373.6	0

-122.271	49.153	MISSION WEST ABBEY	1105192	BC	5.5	0	2.7	12	0	0.5	0	0	0	0	259	0	123	0	20		NA	387.4	0
-123.078	49.381	N VANC GROUSE MTN RESORT	1105658	BC	2.2	2	3.1	15	2	-3	2	66.4	2	NA	277.8	2	NA	2	18		NA	459.3	0
-123.115	49.315	N VANCOUVER WHARVES	1105669	BC		NA						0	0	0	250.8	0	112	0	19		NA		
-122.69	49.208	PITT MEADOWS CS	1106178	BC	5.7	1	NA	12.1	1	-1.6	1		NA		258.9	1	NA		19		NA	367.6	0
-122.713	49.216	PITT MEADOWS	110617P	BC	5.3	0	NA	12.2	0	-2.5	0		NA			NA					NA	393.5	0
-123.265	49.33	POINT ATKINSON	1106200	BC	7.6	0	NA	16	0	2.6	0		NA			NA					NA	321.8	0
-123.087	49.179	RICHMOND DALLYN 2	1106764	BC		NA						0	4	NA	412.4	4	NA	0	21		NA		
-122.881	49.279	PORT MOODY GLENAYRE	1106CL2	BC	5.9	10	2.6	15	10	-7	10	0	10	NA	195.2	10	NA	0	13		NA	253.6	0
-123.303	49.106	SANDHEADS CS	1107010	BC	7.1	0	NA	12.4	0	1.9	0		NA			NA					NA	337.9	0
-122.11	49.113	SUMAS CANAL	1107785	BC	6	19	NA	13	13	0.5	13	0	13	NA	235.4	13	NA	0	10		NA	143.5	0
-123.187	49.183	VANCOUVER SEA ISLAND CCG	1108380	BC	6.2	0	NA	13.3	0	-1.1	0		NA		208.8	0	NA		21		NA	365.4	0
-123.184	49.195	VANCOUVER INTL A	1108395	BC	5.9	0	NA	12.9	0	-2.4	0	0	0	NA	194	0	NA		20		NA	376.1	0
-123.122	49.295	VANCOUVER HARBOUR CS	1108446	BC	7.4	0	NA	13.6	0	2.1	0		NA		229.6	0	NA		20		NA	328.2	0
-123.193	49.347	WEST VANCOUVER AUT	1108824	BC	6.7	2	NA	15.3	2	1.4	2		NA		247.7	2	NA	0	20		NA	329	0
-122.947	50.068	WHISTLER ROUNDHOUSE	1108906	BC	-1.9	0	NA	7.5	0	-11	0	212	0	NA	307.4	0	NA	180	18		NA	615.6	0
-122.784	49.018	WHITE ROCK CAMPBELL SCIENTIFI	1108910	BC	6.8	0	NA	13.5	0	-0.7	0		NA		173.6	4	NA	0	19		NA	345.7	0
-123.111	49.294	VANCOUVER HARBOUR	110Q44V	BC	6.8	0	NA	14.5	0	1.8	0		NA			NA					NA	346.9	0
-121.498	49.368	HOPE A	1113542	BC	4.9	0	NA	11.6	0	0.3	0		NA		236.9	0	NA		18		NA	405.9	0
-121.493	49.37	HOPE AIRPORT	1113543	BC	5	1	NA	11.7	1	0.5	1		NA		238.8	1	NA	0	17		NA	391.2	0
-121.233	49.267	HOPE SLIDE	1113581	BC	0.9	2	2.7	6.5	1	-4	1	13	1	NA	158	1	NA	0	19		NA	495.2	0
-121.934	50.684	LILLOOET	1114619	BC	1.8	1	NA	11.2	1	-5.1	1		NA		17.6	19	NA		3		NA	487.4	0
-121.582	50.224	LYTTON A	1114738	BC	2.1	0	NA	9.9	0	-5	0		NA		92.9	0	NA		13		NA	493.5	0
-121.582	50.224	LYTTON RCS	1114746	BC	2.3	1	NA	10.1	1	-4.8	1		NA		99.3	1	NA		13		NA	470.8	0
-120.333	49.673	JELLICOE	1123721	BC	-2.6	0	NA	5	0	-14.5	0	34	0	NA	43.8	0	NA	25	15		NA	638.7	0
-119.378	49.957	KELOWNA	1123939	BC	0.9	0	NA	8.8	0	-6.4	0		NA		26	0	NA		6		NA	529.6	0
-119.4	49.941	KELOWNA UBCO	1123996	BC	1.2	2	NA	8.5	2	-3.7	2		NA		20.5	2	NA		6		NA	486	0
-120.778	50.113	MERRITT	1125073	BC	-0.5	0	NA	9.9	0	-9.4	0		NA		6.6	28	NA		2		NA	572.8	0
-120.801	50.114	MERRITT STP	1125079	BC	-1.8	21	1.8	5.5	21	-11	21	0	21	NA	3.4	21	NA	0	1		NA	198.3	0
-119.545	49.179	OLIVER STP	1125766	BC	1.3	17	2.4	8.5	17	-5.5	17	0	17	NA	11.8	17	NA	0	3		NA	234	0
-119.441	49.028	OSOYOOS CS	1125852	BC	1.7	0	2.4	8.3	0	-5.1	0		NA		42.3	0	NA		11		NA	506.4	0
-119.717	49.783	PEACHLAND	1126070	BC	2.7	0	3.2	8.5	0	-1.5	0	35	0	112	72.6	0	159	0	9		NA	472.8	0
-119.602	49.463	PENTICTON A	1126146	BC	1.7	0	NA	7.7	0	-6.6	0	9.3	0	NA	23.2	0	NA		6		NA	505.8	0
-120.513	49.468	PRINCETON A	1126510	BC	-2.3	2	3.3	4.5	2	-9.5	2	10	2	NA	20.6	2	NA	15	8		NA	590	0
-120.513	49.468	PRINCETON A	1126518	BC	-2.4	0	NA	6.8	0	-9.5	0		NA			NA					NA	631	0
-119.194	50.223	VERNON AUTO	1128582	BC	0.3	0	NA	5.9	0	-4.1	0		NA		31.3	0	NA		6		NA	547.6	0
-119.056	50.359	VERNON SILVER STAR LODGE	1128584	BC	-3.1	0	NA	5	0	-10.5	0	61	0	NA	61	0	NA	113	13		NA	653.7	0
-120.51	49.465	PRINCETON CS	112FN0M	BC	-2.3	0	NA	6.9	0	-9.6	0		NA		31.3	0	NA	11	8		NA	629.3	0
-119.649	49.563	SUMMERLAND CS	112G8L1	BC	1.3	0	2.2	7.5	0	-4.1	0		NA		28.4	0	NA	0	6		NA	517.1	0
-118.228	49.017	BILLINGS	1140876	BC	0	0	3.5	4	0	-4.5	0	34.4	0	77	58.2	0	97	6	10		NA	557.6	0
-117.633	49.296	CASTLEGAR A	1141455	BC	0.6	0	2.7	5	0	-5	0	36.2	0	56	113	0	125	0	14		NA	540.2	0
-117.774	49.343	CASTLEGAR BCHPA DAM	1141457	BC	2.1	8	3.5	6	4	-5	4	4	4	NA	98.4	4	NA	0	14		NA	366.8	0
-117.633	49.296	CASTLEGAR A	1141460	BC	0.7	0	NA	4.6	0	-4.1	0		NA			NA					NA	537.4	0
-116.972	50.239	DUNCAN LAKE DAM	1142574	BC	1.2	0	3.9	8.5	0	-3	0	32	0	55	97.4	0	106	1	18		NA	520.2	0
-116.458	49.032	LISTER	1144635	BC	-0.2	0	1.9	8	0	-7	0	17.6	0	43	59.4	0	92	0	14		NA	565.4	0
-117.817	50.269	NAKUSP CS	1145297	BC	1.2	2	NA	5.1	2	-2.2	2		NA		60.1	2	NA	6	10		NA	486.6	0
-117.37	49.996	NEW DENVER	1145460	BC	1.8	0	3.7	6	0	-1.5	0	11.8	0	21	95.2	0	101	0	18		NA	502.8	0
-117.305	49.491	NELSON CS	1145M29	BC	1.8	0	NA	6	0	-2.6	0		NA		69.3	0	NA	0	12		NA	500.7	0
-117.739	49.112	WARFIELD RCS	1148705	BC	0.3	0	NA	4.3	0	-3.3	0		NA		134.7	0	NA	15	16		NA	550	0
-116.501	49.082	CRESTON CAMPBELL SCIENTIFIC	114B1F0	BC	0.4	0	NA	7.7	0	-6.4	0		NA		66.9	0	NA		11		NA	544.9	0
-117.399	49.512	NELSON RIXEN CREEK	114EMDM	BC	-0.3	3	NA	4	3	-5	3	65.8	3	NA	91.8	3	NA	32	18		NA	513	0
-115.782	49.612	CRANBROOK A	1152105	BC	-3.2	1	NA	5.9	1	-10.7	1	17.6	0	NA	19.7	0	NA	19	5		NA	635.3	0
-115.789	49.618	CRANBROOK AIRPORT AUTO	1152106	BC	-2.9	0	NA	6.4	0	-10.8	0		NA		25.6	0	NA	26	7		NA	646.6	0
-115.073	49.489	FERNIE	1152850	BC	-2.2	16	3.9	7	16	-11	16	34.6	16	NA	47.2	16	NA		5		NA	303.2	0
-115.461	49.524	FT STEELE DANDY CRK	1153034	BC	-2.2	7	NA	6	3	-10	4	9	3	NA	32.2	3	NA	4	10		NA	484.9	0
-115.962	49.632	KIMBERLEY PCC	1154203	BC	-3.6	13	3.2	5	13	-13	13	26	13	NA	26	13	NA		5		NA	388.8	0
-114.884	49.745	SPARWOOD CS	1157631	BC	-2.3	0	NA	6.2	0	-13.4	0		NA		24.4	0	NA	14	3		NA	628.6	0
-114.883	49.833	SPARWOOD A	1157635	BC	-2.6	0	NA	6	0	-13.6	0		NA			NA					NA	637.4	0
-121.281	50.708	ASHCROFT	1160515	BC	1.1	1	NA	10.2	1	-4.9	1		NA		5.4	28	NA		2		NA	507.7	0
-119.29	52.129	BLUE RIVER A	1160899	BC	-1	2	6.1	3.5	2	-6.5	2	67.8	2	NA	62.4	2	NA	39	13		NA	551.3	0
-119.293	52.125	BLUE RIVER A	1160902	BC	-1.1	3	NA	3.5	3	-6.6	3		NA			NA					NA	533.4	0
-119.29	52.129	BLUE RIVER CS	1160H99	BC	-0.4	3	NA	4.7	3	-6.4	3		NA		81.5	3	NA	38	13		NA	513.8	0
-120.082	51.653	CLEARWATER AUTO	1161650	BC	0.2	0	NA	7.6	0	-4.3	0		NA		43.7	0	NA	6	9		NA	552.2	0
-121.685	51.266	CLINTON A	1161662	BC	-4.7	0	NA	6.6	0	-18.9	0		NA		3.3	0	NA		2		NA	704	0
-121.505	51.144	CLINTON RCS	1161663	BC	-2.6	1	NA	4.4	1	-9.7	1		NA		10.9	1	NA	17	4		NA	618.7	0
-120.449	50.703	KAMLOOPS A	1163781	BC	1.6	0	NA	10.4	0	-5.4	0	16.1	0	NA	24.3	0	NA		8		NA	508.6	0
-120.442	50.702	KAMLOOPS AUT	1163842	BC	1.9	0	NA	10.6	0	-5.7	0		NA		30.2	0	NA		9		NA	499.8	0
-120.8	50.935	RED LAKE	1166658	BC	-2.9	0	3.2	4	0	-10	0	46	0	100	48	0	104	29	9		NA	648.5	0
-119.911	50.903	SUN PEAKS MOUNTAIN	1168204	BC	-3.7	19	NA	3.5	12	-9	11	42	13	NA	42	13	NA		7		NA	260.1	0

-119.778	51.576	VAVENBY	1168520	BC	0.9	0	5.6	8	0	-3.5	0	9.4	0	31	37	0	89	0	8	NA	530.7	0
-120.172	50.63	KAMLOOPS PRATT ROAD	116C8P0	BC	0	0	NA	7	0	-5	0	21.4	0	NA	28.2	0	NA	6	8	NA	557.9	0
-119.291	50.703	SALMON ARM CS	116FRMN	BC	1.4	0	3	9	0	-3.3	0		NA		68	0	NA	0	13	NA	514.7	0
-119.883	50.887	SUN PEAKS LOWER	116Q20D	BC	-2.4	17	NA	1.5	13	-7	11	30	13	NA	30	13	NA		9	NA	285.6	0
-119.918	50.902	SUN PEAKS UPPER	116QK0M	BC	-5.7	15	NA	-0.5	11	-10.5	9	56.2	10	NA	56.2	10	NA		10	NA	378.8	0
-116.982	51.299	GOLDEN A	1173210	BC	-2.4	0	5.4	3	0	-8.5	0	46.6	0	110	46.6	0	106	29	7	NA	633.6	0
-116.982	51.299	GOLDEN A	1173214	BC	-2.6	0	NA	3	0	-8.8	0		NA			NA				NA	638.9	0
-116.984	51.3	GOLDEN AIRPORT	1173220	BC	-2.4	0	NA	3	0	-8	0		NA		51.8	0	NA	23	7	NA	631.4	0
-118.585	52.053	MICA DAM	1175122	BC	0.1	5	4.5	3.5	3	-3	3	135	3	NA	135	3	NA		15	NA	466.6	0
-118.183	50.967	REVELSTOKE A	1176745	BC	1.2	1	NA	4.2	1	-2.6	1		NA		140.6	0	NA		16	NA	503.5	0
-118.176	50.958	REVELSTOKE AIRPORT AUTO	1176755	BC	1.3	0	NA	4.6	0	-2.5	0		NA		149.8	0	NA	18	18	NA	519	0
-116.345	51.443	YOHO PARK	11790J1	BC	-4.9	0	NA	1.2	0	-14.5	0		NA			NA		53		NA	710.1	0
-121.627	55.687	CHETWYND A	1181508	BC	-8.2	3	1	7.5	3	-29.5	3	30.2	3	NA	16.8	3	NA	21	4	NA	732.3	0
-121.627	55.687	CHETWYND A	1181513	BC	-7.5	0	NA	8.8	0	-29.6	0		NA			NA				NA	790.1	0
-120.183	55.742	DAWSON CREEK A	1182289	BC	-9.4	0	NA	10.3	0	-35.8	0		NA		7.8	8	NA		3	NA	849.4	0
-120.74	56.238	FORT ST. JOHN A	1183001	BC	-10	0	NA	7.2	0	-30.5	0	36.6	0	NA	36.6	0	NA	11	9	NA	867.7	0
-120.75	56.248	FORT ST JOHN AIRPORT	1183002	BC	-10.2	0	NA	7	0	-33.3	0		NA		24.4	0	NA	25	9	NA	872.8	0
-123.133	55.299	MACKENZIE	1184791	BC	-3.7	0	NA	3.8	0	-19.3	0		NA		63	0	NA		12	NA	673.9	0
-123.138	55.305	MACKENZIE AIRPORT AUTO	1184793	BC	-3.6	0	NA	4.1	0	-18	0		NA		110.9	0	NA	44	18	NA	670.2	0
-130.031	58.422	DEASE LAKE A	1192341	BC	-11.8	0	NA	1.8	0	-35.2	0		NA		5.2	0	NA		1	NA	922.3	0
-122.597	58.836	FORT NELSON A	1192946	BC	-19.4	1	NA	-4.4	1	-37	1	17.2	0	NA	22.7	0	NA	44	8	NA	1121	0
-122.574	58.841	FORT NELSON	1192948	BC	-18.6	0	NA	-4	0	-36.2	0		NA		26.8	0	NA	37	6	NA	1135.2	0
-130.025	58.426	DEASE LAKE (AUT)	119BLM0	BC	-11.7	0	NA	2	0	-35.8	0		NA		15.6	0	NA	33	5	NA	921.3	0

QUARTERLY REPORTS

Select quarter: 2024 - Quarter 4

QUARTER 4 - 2024 (OCT 1 - DEC 31)

Numbers are correct as of Mar 1, 2025

ANIMALS SUBMITTED BY REGION

Region	Mammals	Birds	Other	Total
Pacific	8	0	0	**8**
Prairie	139	93	7	**239**
Central Canada	110	238	50	**398**
Atlantic	21	201	2	**224**
North	20	32	4	**56**
TOTAL	**298**	**564**	**63**	**925**

ANIMALS SUBMITTED BY PROVINCE

Province	Mammals	Birds	Other	Total
Alberta	14	27	4	**45**
British Columbia	8	0	0	**8**
Manitoba	0	0	0	**0**
New Brunswick	3	10	0	**13**
Newfoundland and Labrador	0	119	0	**119**
Northwest Territories	4	20	4	**28**
Nova Scotia	13	47	1	**61**
Nunavut	16	4	0	**20**
Ontario	82	142	3	**227**
Prince Edward Island	5	25	1	**31**
Québec	28	96	47	**171**
Saskatchewan	125	66	3	**194**
Yukon	0	8	0	**8**
TOTAL	**298**	**564**	**63**	**925**

NOTE: Not all provinces submit animals to the CWHC for testing.

CAUSE OF DEATH

	Emaciation	Infectious/Inflammatory	Toxicity/Poisoning	Trauma	Other
Birds	14	147	15	123	41
Mammals	9	77	5	50	115
Other	1	15	0	9	30

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	Emaciation	Infectious/Inflammatory	Toxicity/Poisoning	Trauma	Other
TOTAL	33	401	6	246	122

NOTE: An additional 142 cases submitted to CWHC in this quarter are still pending cause of death determination; 71 birds, 47 mammals, and 24 other species. 'Other' diagnoses include neoplastic, metabolic, and degenerative diseases as well as those cases where no cause of death could be determined.

SELECTED DISEASE COUNTS

	Examined	Positive	
Rabies	575	10	Provincial summary
White nose syndrome	35	0	Provincial summary
Avian Influenza	504	17	Provincial summary
Chronic wasting disease	83	12	Provincial summary
Bovine tuberculosis	83	0	Provincial summary
Avian Cholera	125	0	Provincial summary

BLOG ARTICLES

OCTOBER

https://healthywildlife.ca/the-state-of-the-bats-in-north-america/

https://healthywildlife.ca/west-nile-virus-update-for-ontario/

https://healthywildlife.ca/stowaway-bats/

NOVEMBER

https://healthywildlife.ca/thanking-patrick-zimmer/ https://healthywildlife.ca/remercier-patrick-zimmer/

https://healthywildlife.ca/cwhc-at-the-heroes-4-wildlife-environmental-awareness-festival/

https://healthywildlife.ca/annonce-du-cadre-de-vision-du-rcsf-une-declaration-collective-sur-qui-nous-sommes/

https://healthywildlife.ca/besnoitia-tarandi-in-caribou-ive-got-you-under-my-skin/

DECEMBER

https://healthywildlife.ca/tracking-the-causes-of-mortality-in-american-crows-in-quebec-2022-to-2024/

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Rev. sci. tech. Off. int. Epiz., 2009, **28** (1), 59-67

Tenacity of avian influenza viruses

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Summary

The goal of this review is to provide an overview of existing research on the environmental tenacity of avian influenza (AI) viruses, to identify gaps in our current understanding, and discuss how this information relates to AI control, eradication, and prevention. We are just beginning to understand the environmental factors that affect infectivity and the extent of variation in environmental tenacity that is present among these viruses. Because the environment can provide a bridge for AI virus transmission between many diverse hosts, including wild and domestic animals and man, understanding the importance of environmental transmission and identifying important points of contact are critical steps in preventing the spread of infection especially related to the introduction of these viruses to new host species.

Keywords

Avian influenza viruses – Environmental transmission – Faeces – Highly pathogenic avian influenza virus – H5N1 – Infectivity – Tenacity – Water.

Introduction

Although the transmission of avian influenza (AI) viruses within both wild and domestic avian populations can be linked to environmental sources, information on their tenacity, or the ability of these viruses to remain infective outside of the host, is limited. The goals of this short review are:

– to provide an overview of existing research on the environmental tenacity of avian influenza virus (AIV)

– to identify gaps in our current understanding of the factors potentially affecting AIV infectivity in the environment

– to discuss why this understanding is important to AI control, eradication, and prevention

– to provide insight into future research needs pertaining to AIV in the environment.

This review will not include methods for virus inactivation associated with cleaning and disinfection of AIV-infected premises as there is an excellent review of this topic currently available (3).

The role of the environment in the natural history of avian influenza

Avian influenza transmission

Wild aquatic birds in the Orders Anseriformes and Charadriiformes are the primordial reservoir for AIV (30). The transmission of AIV within these wild bird populations is dependent on faecal/oral transmission via contaminated water (11, 12, 26, 28). Replication of AIV in ducks occurs primarily in the intestinal tract, with high concentrations of infectious virus shed in faeces (13, 38). Webster *et al.* (38) reported that experimentally infected Muscovy ducks (*Cairina moschata*) shed 6.4 g of faecal material per hour, with an infectivity of $1\times10^{7.8}$ median egg infective doses (EID_{50}), and these birds excreted an estimated 1×10^{10} EID_{50} of AIV within a 24 h period. In addition to a high level of viral excretion, the duration of viral shedding in ducks can also be prolonged. Hinshaw *et al.* (12) reported that infected Pekin ducks (*Anas platyrhynchos*) were capable of shedding virus via the cloaca for more than 28 days. Avian influenza viruses have also been isolated from surface water

in Alberta (12), Minnesota (10), and Alaska (16) from aquatic habitats utilised by wild ducks. In some of these cases AIVs were isolated from the water without sample concentration.

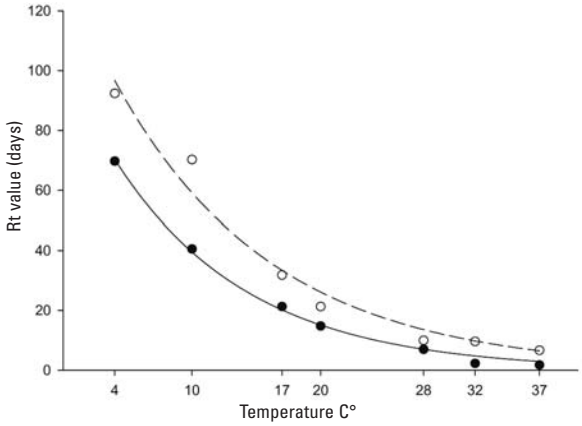
Tenacity of avian influenza viruses in water

Despite the recognised importance of faecal/oral and water-borne transmission of these viruses in bird populations, existing data on AIV persistence in faeces, water, environmental surfaces, and carcasses are limited. Environmental persistence of AIV was initially investigated by Webster *et al.* (38) using A/Duck/Memphis/546/74 (H3N2) in both faecal material and non-chlorinated river water. An initial dose of $10^{6.8}$ EID_{50} in faeces, and $10^{8.1}$ EID_{50} in water remained infective for at least 32 days (when the experiment ended), suggesting that contaminated aquatic environments could serve as a source of infection. Subsequently, AIV persistence was evaluated in faeces (2, 23) and allantoic fluid (23). Other than the original work (38), only four studies (4, 5, 31, 32) have evaluated the persistence of low pathogenic AIV (LPAIV) isolated from wild ducks in water using an experimental system (32). Collectively, these experimental studies demonstrated that these naturally occurring AIVs can persist for months in water at 4°C, 17°C, and 28°C. The duration of infectivity was inversely related to water temperature, and temperature-related variation was extreme, as some viruses remained infective well over a year at 4°C, but only days at 37°C (5). These studies also determined that AIV infectivity is dependent on basic water chemistry (pH and salinity) at values within ranges normally encountered in surface water in the field. Individual AIVs demonstrate phenotypic variation in their ability to remain infective under variable pH and salinity conditions, and an interactive effect between salinity and pH has been reported (31). These laboratory data are relevant to field conditions, and results obtained with a distilled water system paralleled results obtained using surface water collected from duck habitats in Louisiana (31).

The effects of pH, salinity, and temperature as described for AIVs representing 12 haemagglutinin (HA) subtypes (5) can be summarised as follows:

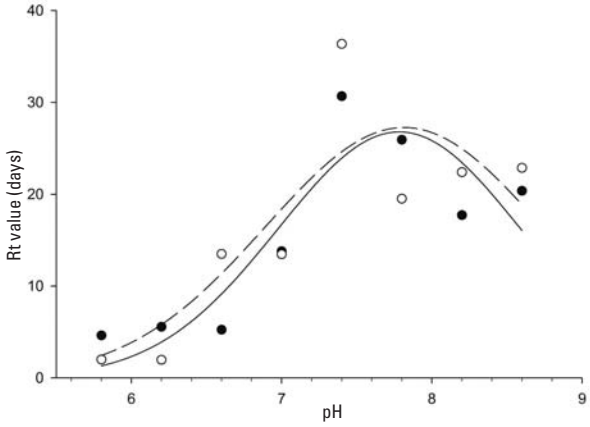
– temperature greatly influences the duration of viral infectivity and the temperature/infectivity relationship can be described with an exponential decay function; variation between viruses is most evident under cold water (4°C) conditions, with little variation observed at temperatures >28°C (Fig. 1)

– pH greatly affects infectivity, with a rapid loss of infectivity below pH 6.5; all viruses were most stable between pH 7.4 and pH 8.2, but variation in pH tolerance was observed between individual viruses (Fig. 2)



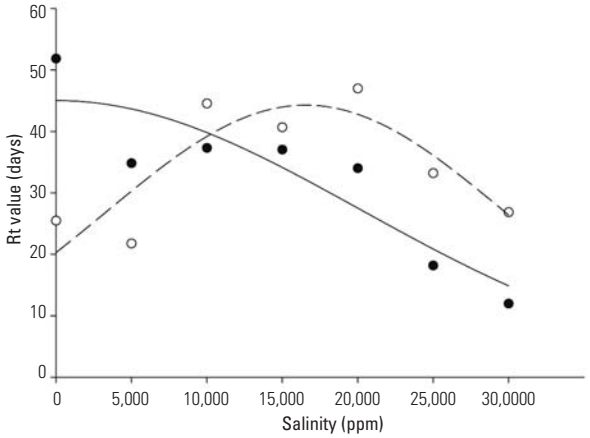
Rt : time in days for 90% reduction in viral titre ($CCID_{50}$/ml)
Filled circles and solid line: A/Mallard/MN/355788/00 (H12N5)
Open circles and dashed line: A/Northern Pintail/Tx/421716/01 (H8N4)

Fig. 1
Effects of temperature on avian influenza virus inactivation in water (5)



Rt: time in days for 90% reduction in viral titre ($CCID_{50}$/ml)
Filled circles and solid line: A/Mallard/MN/355788/00 (H12N5)
Open circles and dashed line: A/Northern Pintail/Tx/421716/01 (H8N4)

Fig. 2
Effects of pH on avian influenza virus inactivation in water (5)



Rt: time in days for 90% reduction in viral titre ($CCID_{50}$/ml)
Filled circles and solid line: A/Green-winged Teal/LA/213GW/87 (H1N1)
Open circles and dashed line: A/Mallardl/MN/199057/99 (H4N6)

Fig. 3
Effects of salinity on avian influenza virus inactivation in water (5)

– viruses were most stable at 0 ppm (fresh water) or 15,000 ppm (brackish water) rather than 30,000 ppm (ocean water) sodium chloride; individual viruses differed with some more stable at 0 ppm and some more stable at 15,000 ppm (Fig. 3).

Within-subtype variation has been investigated using the laboratory model system with LPAI viruses of the H5 and H7 subtypes (4). As in the previous studies, the duration of viral persistence decreased with increasing temperature and a variable response was observed with salinity; some viruses persisted longer at 0 ppm while others persisted longer at 15,000 ppm. Observed variation within subtype suggests that environmental tenacity is not dependent on an HA subtype. However, these results are limited to two subtypes (H5 and H7) and the effects of pH were not evaluated in this study.

These findings suggest that even minor fluctuations in temperature, pH, and salinity at levels normally encountered in natural aquatic habitats may enhance or diminish environmental persistence and potential transmission of AIV. In addition, variation in the response of AIVs to these variables may indicate that environmental selective pressures impact on virus maintenance and transmission in the field and the ability of an AIV to transmit within and between wildlife reservoirs and domestic animal systems.

Environmental conditions may also influence the potential for aerosol transmission. With human influenza viruses evaluated in a guinea pig model, it was demonstrated that transmission was enhanced under both cold and dry conditions (22). Low relative humidity can affect dispersal factors that enhance virus availability, and in aerosols virus infectivity is maximised at low relative humidity (27). The environmental conditions that potentially affect aerosol transmission of AIV have not been evaluated but may have important implications for transmission within domestic avian populations, especially those kept under confinement or artificially modified conditions, such as feral waterfowl populations or sanctuaries.

Detection of avian influenza viruses from environmental samples

Relatively few studies have aimed at isolating AIVs directly from surface waters, but the presence of these viruses in environmental samples has been repeatedly documented (10, 12, 16, 19). The methodology used in these studies varied and at present there is no single recommended method for recovering or detecting these viruses from environmental samples. To date, AIV has been successfully demonstrated in water samples through direct culture (9) and through virus concentration with formalin fixed chicken erythrocytes (16, 18). Using polymerase chain reaction (PCR), AIV ribonucleic acid (RNA) has also been detected in sediment samples (19). Long-term detection of AIV from aquatic habitats following the departure of waterfowl has been reported in two studies in Alaska, and in both cases a relatively high prevalence of infected water (1% to 7% by virus isolation) (16) or sediment (56% PCR positive) samples were reported (19).

Avian influenza tenacity in man-made environments

The environment and transmission within poultry populations

With regard to viral transmission from wild to domestic fowl, contaminated surface and ground water has been suggested as a long- and short-term source of AIV for domestic turkeys (10). In addition, contaminated fomites have long been recognised as an important factor in AIV transmission between widely separated poultry flocks (34). Domestic chickens and turkeys can shed large quantities of virus for extended periods of time, as long as 36 days for chickens (14) and 72 days for turkeys (35). Few specifics are known regarding the contribution of environmental transmission to maintaining infections within domesticated avian flocks, but in captive studies (33) and in live-bird markets (21) influenza viruses were isolated from water sources. In fact, the surveillance method used to detect AIV of subtype H9 in water provided to caged birds in live bird markets in Hong Kong has been recommended as a very efficient surveillance methodology that may be more efficient than isolation from the cloacal or faecal samples (21).

Environmental transmission may be extremely important within domestic duck populations. However, to date, few research efforts have been directed toward this topic. In a study in Hong Kong, an H3N2 AIV was isolated from faeces and pond water every month during a one year period, and the maintenance of this virus was proposed to be dependent on environmental persistence and the continued introduction of susceptible ducklings (25). Domestic ducks are recognised as an important reservoir for the Asian lineage highly pathogenic H5N1 AIV (15), but the extent and significance of environmental contamination in this reservoir is undefined.

The environment and transmission from poultry

Information related to the transmission of AIV from infected poultry flocks to other animals or humans via

environmental sources is lacking. This is an area that deserves attention, especially in those cases where AIVs are present in free-ranging domestic flocks or under confinement conditions where faeces or other effluent are deposited into the environment. In chicken faeces, inactivation of AIV can be rapid at high temperatures (above 25°C) (6) but is prolonged at low temperatures; for example, at 20°C AIV can remain infectious in chicken faeces for 7 days (23), but at 4°C the virus can remain infectious for as long as 30 days (2). However, these studies evaluating AIV tenacity in chicken faeces included a very limited number of viruses and the extent of variation related to virus strains and subtypes is currently unknown. The host may also be important as longer persistence of AIV in domestic duck faeces (4 to 6 days) has been reported (36). Although not identified as a risk factor in a case-control study of LPAIV H7N2 in domestic poultry in the United States of America (24), contaminated poultry litter has a potential role in AIV transmission, to date, however, this role remains undefined. Another source of environmental contamination involves infected bird carcasses, which have been implicated in the transmission of highly pathogenic avian influenza virus (HPAIV) H5N1 to carnivores (17). Although there has been significant work related to inactivation of AIV in poultry products (34), information about the duration of AI infectivity in wild and domestic bird carcasses under applicable field conditions is essentially lacking.

Highly pathogenic H5N1 viruses

Although data from environmental surveillance conducted during an outbreak of HPAI H5N1 viruses suggests a potential role for environmental transmission (36), information related to the ability of these viruses to persist in the environment is very limited, as summarised by Algers (1). Brown *et al.* (4) evaluated the duration of infectivity of two HPAI H5N1 viruses (A/Whooper Swan/Mongolia/244/05 and A/Duck Meat/Anyang/AVL-1/01). The evaluation showed that the duration of infectivity of these viruses was shorter than those of LPAIV H5 and H7 derived from ducks and shorebirds. While these initial results indicated that these two HPAI viruses were not as environmentally fit as LPAIV, subsequent evaluations of additional and more recent HPAI H5N1 viruses from Asia indicate much more variation. Some of the HPAI H5N1 viruses are very stable in water, with the duration of infectivity similar to naturally occurring LPAIVs (J.D. Brown, unpublished data). This scenario is consistent with other phenotypic examinations of HPAI H5N1 viruses, which indicate that they have evolved over 10 years into a group of AIVs that exhibit highly variable biological properties.

Unknowns and possibilities related to avian influenza in the environment

The role of the biotic community in influenza inactivation or concentration

There is limited information on the environmental tenacity of these viruses in intact biological systems. Biological components, such as bacteria (8, 37), biofilms (29), or feeding bivalves (20) have all been associated with loss of infectivity, removal, or in some cases concentration of many viruses. In a recent study of AIV in surface water samples from the Black Sea, Zarchov *et al.* demonstrated a loss in AIV infectivity related to increasing concentrations of normally occurring microorganisms (39). There are no published reports of AIV uptake by feeding bivalves or other filter feeding organisms, nor any reports related to possible associations with biofilms. To date, the potential effects of the biotic community on AIV infectivity in environmental sources has been largely ignored.

Other abiotic factors that may reduce infectivity in the environment

To date, abiotic factors that have been evaluated include temperature, pH, salinity, and in the case of human influenza viruses, relative humidity. From this limited data it is obvious that much additional work remains to be done to evaluate the importance of, for example, desiccation (tissue and faeces), other water quality parameters (metal oxides, dissolved oxygen and fluctuations in temperature or salt levels) and ultra violet (UV) irradiation. No effect was observed when AIVs in faeces were subjected to UV irradiation and this was attributed to the inability of UV irradiation to penetrate the faecal samples (6). This reinforces the need to fully understand the distribution of these viruses in the environment, as this could greatly influence how potential biotic and abiotic components affect AIV persistence. Due to the complexity of these environments and the large number of potential interacting variables that can affect infectivity, it is essential that these questions be addressed using both controlled laboratory experiments and well designed field studies.

Distribution in aquatic environments

Most of the isolations of AIV from wild bird habitats have been associated with faeces and water. Although it is well established that these viruses can be isolated from avian faeces (38), there is little information available related to their tenacity in wild bird faeces. With water, a different deficiency in our understanding exists. Although there are

numerous reports of AIV isolation from surface waters, there have been no evaluations to determine the distribution of this virus in an aquatic ecosystem. It has only recently been demonstrated that AIV RNA can be detected for long periods of time in sediments of habitats utilised by waterfowl (19), but infectious virus has not been detected. It would appear unlikely that AIV is distributed equally throughout the water column, and in fact, this may not present the best opportunity for birds that feed at the sediment interface (e.g. dabbling ducks such as mallard) to be infected. It is possible, and likely, that virus is present in the environment associated with faeces or other organics within or at the sediment surface, and if so, this association could greatly influence the potential for transmission to host species using or having contact with a contaminated environment.

The short- and long-term significance of environmental tenacity

The ability of these viruses to remain infectious for extended periods in the environment could greatly influence transmission and it is possible that this is critical to AIV maintenance within the primordial wild bird reservoir. It has been suggested that AIV preserved in ice associated with waterfowl habitats may represent a long-term (years) environmental reservoir (40). The detection of AIV RNA in sediment samples in Alaska waterfowl habitats supports this (19), but the concept has not been confirmed through virus isolation in any study to date. Survival in water has also been suggested as a source of groundwater contamination, which could represent a source of virus to domestic poultry (9), but this also remains to be verified by virus isolation.

The environmental tenacity and subsequent transmission of viruses through contact with infected environments have potential short-term significance, because environmental tenacity and transmission provide mechanisms for:

– sustaining annual epidemics in migratory wild bird populations that utilise the same habitats but are temporally disconnected

– connecting avian species that are spatially disconnected (utilising different components of the same habitats)

– enhancing transmission on wintering grounds.

On the wintering grounds, birds are more dispersed, population immunity is increased (fewer susceptible birds) and a low prevalence of AIV is observed (30). An environmental source of virus on wintering ground habitats may be critical for these viruses to persist in wild bird populations during this season.

Potential selection due to environmental fitness

Existing studies (4, 5, 31, 32) demonstrate that individual AIVs differ greatly in their ability to remain infectious under environmental stressors such as pH, temperature, and salinity. Although these variables represent only a small portion of the potential environmental variables that could enhance or diminish viral infectivity in water, it is clear that some viruses may be more environmentally fit than others. Considering the potential transmission advantages associated with remaining infectious in the environment for extended periods of time, environmental tenacity may be a prerequisite for the survival of specific AIV strains, subtypes or genotypes. Although these viruses are genetically and phenotypically diverse and continually changing as a result of genetic drift and shift, they are not equally represented in wild bird populations. For example, isolates from ducks are dominated by H3, H4, and H6 viruses, while H13 and H16 viruses are primarily associated with gulls (30). This non-random pattern may be driven by environmental as well as host-related factors, and with wild birds that occupy very different habitats (gulls versus ducks), host and environmental factors may be linked. Additional work is needed in this area as an understanding of 'environmental fitness' may be critical to assessing the potential of viruses like HPAIV H5N1 to spill over from domestic to wild birds and subsequently be transmitted or maintained in these wild populations.

The potential role of environmental fitness and adaptation to new host systems: the bridge

An environment contaminated with AIV would potentially provide a connection between wild and domestic avifauna and mammals utilising a specific area (7). The potential for this exchange was recently demonstrated in a study in Cambodia (36), where AIV was detected by PCR in 35% of environmental samples (mud, pond water, water plants, and water swabs) associated with backyard poultry. Environmental contamination offers a two-way street to connect all potential hosts and this connection needs to be considered when designing and implementing preventive measures or when interpreting field data. For example, the isolation of HPAIV H5N1 from wild birds in the presence of infected domestic birds (as currently occurring in Asia) does not indicate a wildlife reservoir, as the virus could potentially originate from an environment contaminated by a domestic bird source. This is especially relevant when considering the impact of domestic ducks, which are considered the most important reservoir for these HPAI H5N1 viruses (15). Likewise, it is possible that an infected wild bird could effectively disseminate these viruses if its movements are associated with habitats shared with other wild or domestic birds.

Environmental fitness may also affect the ability of a given virus to effectively adapt to changing environments associated with new host systems and it is important to consider that the significance of environmental tenacity may change as these adaptations occur. For example, an AIV might be dependent on environmental (water) persistence to be maintained in a wild or domestic waterfowl population, but this may be irrelevant when a virus spreads to poultry in confinement. In this case, direct contact may drive transmission, or transmission may be more dependent on environmental factors affecting aerosols. These connections and possibilities, at present, are largely circumstantial and speculative, but need to be understood and considered if we are to gain a clearer understanding of AIV natural history or the epidemiology of new viruses such as HPAIV H5N1.

Conclusion

Although current research has detected AIV in environmental sources, and experiments have demonstrated the potential for these viruses to remain infectious for long periods of time under conditions that would be encountered in the field, the significance and extent of AIV environmental contamination is not well defined. These gaps in our knowledge impact our ability to fully understand the transmission and maintenance of these viruses within and between wild and domestic animal reservoirs, and they represent a major impediment to designing and implementing effective AI prevention, control, or eradication strategies.

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La stabilité des virus de l'influenza aviaire

D.E. Stallknecht & J.D. Brown

Résumé

Après avoir fait le point sur les travaux de recherche dédiés à la capacité des virus de l'influenza aviaire de perdurer dans l'environnement, les auteurs indiquent les lacunes de connaissance subsistant dans ce domaine et expliquent l'intérêt de ces informations pour le contrôle, l'éradication et la prévention de l'influenza aviaire. L'importance des facteurs environnementaux pour l'infectiosité des virus de l'influenza et les variations de la stabilité environnementale constatées chez ces virus commencent seulement à être élucidées. L'environnement intervenant comme pont de transmission des virus de l'influenza aviaire entre une grande diversité d'hôtes, dont les animaux domestiques et sauvages et l'homme, il est primordial de bien comprendre le rôle de la transmission par l'environnement et d'identifier les principaux points critiques de contact afin de prévenir la propagation de l'infection et plus particulièrement d'empêcher que ces virus puissent investir de nouvelles espèces hôtes.

Mots-clés

Eau – Fèces – Infectiosité – Sous-type H5N1 – Stabilité – Transmission par l'environnement – Virus de l'influenza aviaire – Virus de l'influenza aviaire hautement pathogène.

■

Persistencia de los virus de la influenza aviar

D.E. Stallknecht & J.D. Brown

Resumen
En este artículo se presenta una reseña general de los estudios realizados sobre la persistencia de los virus de la influenza aviar en la naturaleza, las lagunas de los conocimientos actuales sobre el tema y sus consecuencias en el control, erradicación y prevención de la enfermedad. Apenas se han comenzado a comprender los factores medioambientales que influyen en la infecciosidad de esos virus y las variaciones de su supervivencia en la naturaleza. El medio ambiente es una vía potencial de transmisión de los virus de la influenza aviar entre muchos hospedadores distintos, comprendidos los animales silvestres y domésticos, así como los seres humanos. Por consiguiente, es preciso comprender su diseminación por conducto de la naturaleza y determinar los principales puntos de contacto para impedir su propagación, en particular a nuevas especies hospedadoras.

Palabras clave
Agua – Excremento – H5N1 – Infecciosidad – Persistencia – Transmisión medioambiental – Virus de la influenza aviar – Virus de la influenza aviar altamente patógena.

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ACKNOWLEDGMENTS

The transcriptome data are archived at NCBI's Gene Expression Omnibus database (series record GSE56278: www.ncbi.nlm.nih.gov/geo/query/acc.cgi?acc=GSE56278). Funding was provided by The Gordon and Betty Moore Foundation through grant GBMF2629, the Schmidt Ocean Institute, and a fellowship from the NSF to N.T.K. We thank M. van Oppen, I. Baums, M. De Salvo, L. Bay, M. Morikawa, and O. Hoegh-Guldberg for comments on earlier versions of the manuscript. We also thank the U.S. National Park of American Samoa for permission to work on Ofu reefs and C. Caruso for logistical and research help.

SUPPLEMENTARY MATERIALS

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Materials and Methods
Figs. S1 and S2
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27 January 2014; accepted 1 April 2014
Published online 24 April 2014;
10.1126/science.1251336

EVOLUTION

Ancient DNA reveals elephant birds and kiwi are sister taxa and clarifies ratite bird evolution

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The evolution of the ratite birds has been widely attributed to vicariant speciation, driven by the Cretaceous breakup of the supercontinent Gondwana. The early isolation of Africa and Madagascar implies that the ostrich and extinct Madagascan elephant birds (Aepyornithidae) should be the oldest ratite lineages. We sequenced the mitochondrial genomes of two elephant birds and performed phylogenetic analyses, which revealed that these birds are the closest relatives of the New Zealand kiwi and are distant from the basal ratite lineage of ostriches. This unexpected result strongly contradicts continental vicariance and instead supports flighted dispersal in all major ratite lineages. We suggest that convergence toward gigantism and flightlessness was facilitated by early Tertiary expansion into the diurnal herbivory niche after the extinction of the dinosaurs.

Despite extensive studies, the evolutionary history of the giant flightless ratite birds of the Southern Hemisphere landmasses and the related flighted tinamous of South America has remained a major unresolved question. The ratites and tinamous, termed "palaeognaths" due to their shared basal palate structure, form the sister taxon to all other living birds (neognaths). The living ratites are one of the few bird groups composed largely of giant terrestrial herbivores and include: the emu and cassowary in Australia and New Guinea, the kiwi in New Zealand, the ostrich in Africa, and the rhea in South America. In addition, two recently extinct groups included the largest birds known: the moa from New Zealand (height up to 2 to 3 m, 250 kg in weight) (*1*) and elephant birds from Madagascar (2 to 3 m in height, up to 275 kg in weight) (*2*, *3*). Ratites have been believed to have originated through vicariant speciation driven by the continental breakup of the supercontinent Gondwana on the basis of congruence between the sequence of continental rifting and the presumed order of lineage divergence and distribution of ratites (*4*, *5*).

New Zealand is the only landmass to have supported two major ratite lineages: the giant herbivorous moa and the chicken-sized, nocturnal, omnivorous kiwi. Morphological phylogenetic analyses initially suggested that these two groups were each other's closest relatives (*6*, *7*), presumably diverging after the isolation of an ancestral form following the separation of New Zealand and Australia in the late Cretaceous ~80 to 60 million years ago (Ma) (*8*). However, subsequent studies suggest that kiwi are more closely related to the Australasian emu and cassowaries (*9*, *10*), whereas the closest living relatives of the giant moa are the flighted South American tinamous (*11*–*14*). The latter relationship was completely unexpected on morphological grounds and suggests a more complex evolutionary history than predicted by a model of strict vicariant speciation. By rendering ratites paraphyletic, the relationship between the moa and tinamous also strongly suggests that gigantism and flightlessness have evolved multiple times among palaeognaths (*12*, *13*).

Perhaps the most enigmatic of the modern palaeognaths are the recently extinct giant Madagascan elephant birds. Africa and Madagascar were the first continental fragments to rift from the supercontinent Gondwana, separating from the other continents (and each other) completely during the Early Cretaceous (~130 to 100 Ma) (*15*). Consequently, the continental vicariance model predicts that elephant birds and ostriches should be the basal palaeognath lineages (*16*). Most molecular analyses recover the ostrich in a basal position, consistent with a vicariant model. However, the phylogenetic position of the elephant birds remains unresolved, as cladistic studies of ratite morphology are sensitive to character choice and may be confounded by convergence (*17*), whereas DNA studies have been hampered by the generally poor molecular preservation of elephant bird remains (*18*).

We used hybridization enrichment with in-solution RNA arrays of palaeognath mitochondrial genome sequences and high-throughput sequencing to sequence near-complete mitochondrial genomes from both elephant bird genera: *Aepyornis* and *Mullerornis*. Phylogenetic analyses placed the two taxa, *Aepyornis hildebrandti* (15,547 base pairs) and *Mullerornis agilis* (15,731 base pairs), unequivocally as the sister taxa to the kiwi (Fig. 1 and fig. S1). This result was consistently retrieved, regardless of phylogenetic method or taxon sampling, and was strongly supported by topological tests (*19*). To our knowledge, no previous study has suggested this relationship, probably because of the disparate morphology, ecology, and distribution of the two groups. Elephant birds were herbivorous, almost certainly diurnal, and among the largest birds

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known, whereas kiwi are highly derived omnivores, nocturnal, and about two orders of magnitude smaller. Elephant birds more closely resemble the moa, and analyses of morphology have suggested a close relationship between these taxa (*17*). However, adding morphological characters to our molecular data set increased support for the relationship between elephant birds and kiwi (figs. S2 and S3) and allowed for identification of several distinctive character states that diagnose this clade [see list in (*19*)].

Speciation by continental vicariance provides a poor explanation of the close relationship between elephant birds and kiwi. Madagascar and New Zealand have never been directly connected, and molecular dates calculated from the genetic data suggest that kiwi and elephant birds diverged after the breakup of Gondwana (Fig. 1 and fig. S4). However, mean node age estimates among palaeognath lineages are sensitive to taxon sampling (Fig. 2), so molecular dating provides limited power for testing hypotheses about ratite biogeography. Depending on taxon sampling, estimates for the basal divergence among palaeognaths are equally consistent with the separation of Africa ~100 Ma (*15*) and the Cretaceous-Tertiary (KPg) boundary (~65 Ma) (Fig. 2). Thus, topological comparisons may be a more robust tool to test hypotheses of vicariance and connection.

The phylogenetic placement of the elephant bird as sister to the kiwi creates a marked discordance between the order of continental breakup (Fig. 3, A and B) and the sequence of palaeognath divergences (Fig. 3C). Instead, it appears that the common ancestor of elephant birds and kiwis was probably flighted and capable of long-distance dispersal, which is supported by a small, possibly flighted kiwi relative from the Early Miocene of New Zealand (*20*). Together, the phylogenetic position of the flighted tinamous and apparent flighted ancestor of the kiwi and elephant bird imply that every major ratite lineage independently lost flight (Fig. 1). We suggest that flighted dispersal was the primary driver of the distribution of palaeognath lineages and that the discordance between distribution and phylogeny is more consistent with lineage turnover in a phylogenetically diverse, flighted, and widespread clade. Early Tertiary palaeognaths were capable of long-distance dispersal, with remains found well outside the range of modern ratites, including the flighted lithornithids in North America and Europe and the flightless *Palaeotis* and *Remiornis* in Europe (Fig. 3A) (*21*). Rapid diversification through flighted dispersal also provides an explanation for the short and often poorly supported internodes amongst basal extant ratite lineages (*13*, *14*).

Early ratite evolution appears to have been dominated by flighted dispersal and parallel evolution, with flightlessness evolving a minimum of six times and gigantism a minimum of five (Fig. 1) (*22*), suggesting that adaptations for cursoriality may have confounded phyloge-

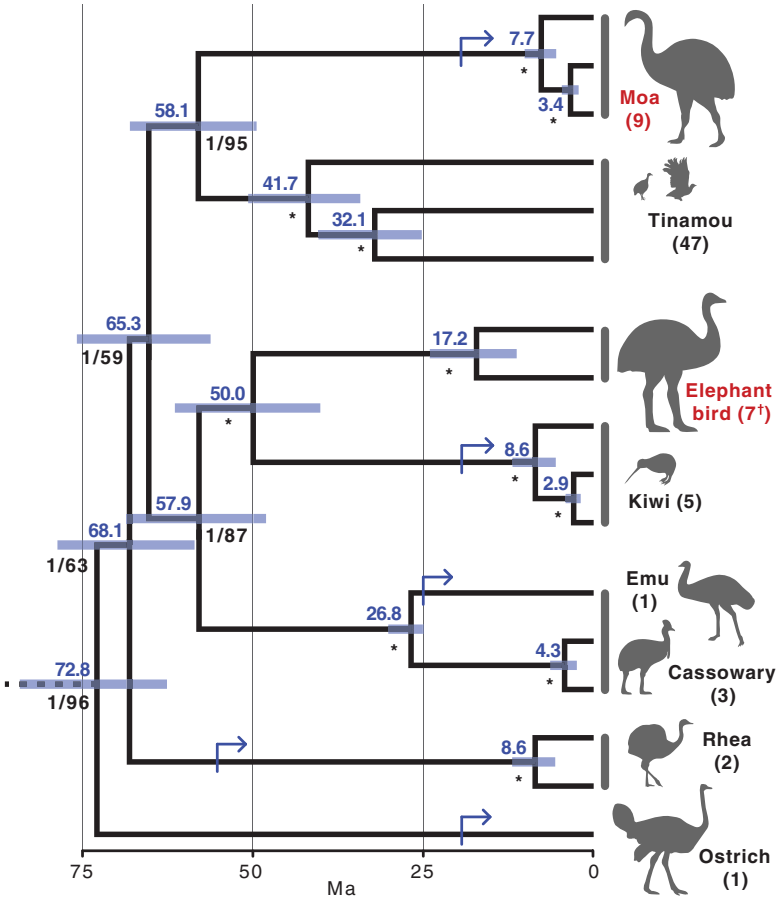

Fig. 1. Phylogenetic position of the elephant birds from mitochondrial sequence data. Bayesian posterior probabilities and maximum likelihood bootstrap are presented in black below each branch; asterisks denote branches that received maximum possible support (bootstrap = 100%, Bayesian posterior probability = 1.0). Divergence dates [blue numbers above branches; blue bars represent 95% highest posterior density (HPD) intervals] were inferred with six well-supported node age constraints (table S5). Blue arrows mark the minimum date for the evolution of flightlessness in lineages for which fossil evidence is available (*21*, *22*). The scale is given in millions of years before the present. Silhouettes indicate the relative size of representative taxa. Species diversity for each major clade is presented in parentheses, with extinct groups shown in red. The dagger symbol (†) indicates that the number of elephant bird species is uncertain.

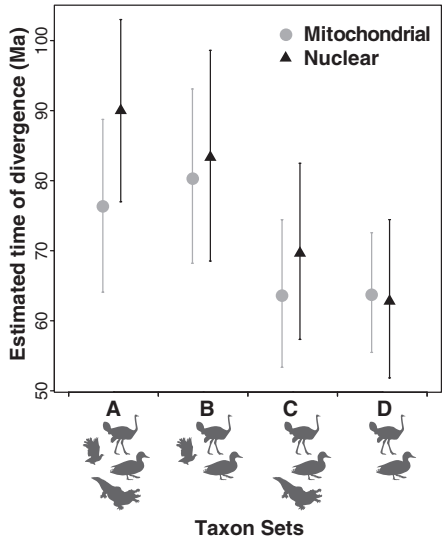

Fig. 2. Sensitivity of palaeognath age estimation to taxon sampling and genetic loci used. Mean and 95% HPD intervals are displayed for the age (basal divergence) of crown palaeognaths, as inferred under several data set permutations. The *y* axis represents time before the present in millions of years, whereas age estimates for individual data sets are arrayed on the *x* axis for both mitochondrial (circles) and nuclear loci (triangles). Results are presented for the following taxon sets: A, a full taxon set including ratites, tinamous, neognaths, and crocodilians; B, ratites, tinamous, and neognaths only; C, ratites, neognaths, and crocodilians only; and D, ratites and neognaths only. Taxon sets A and C are each calibrated with six fossil node constraints, whereas taxon sets B and D are calibrated with a subset of four relevant constraints (table S5). Taxon sets are represented visually with silhouettes of an ostrich (ratites), a flying tinamou (tinamous), a duck (neognaths), and an alligator (crocodilians). Analyses excluding the rate-anomalous tinamous (taxon sets C and D) retrieve a young age near the KPg boundary.

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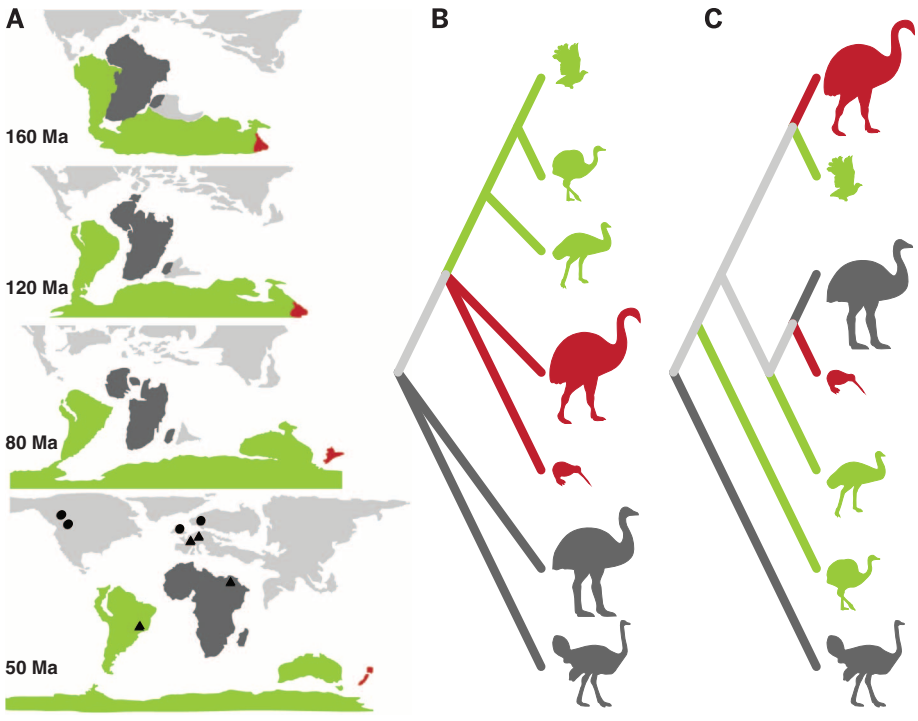

Fig. 3. Conflict between inferred palaeognath phylogeny and the topology predicted by continental vicariance. (**A**) Relative position of continents during the Late Cretaceous and Tertiary. Continental landmasses are colored according to order of severance from the remaining Gondwanan landmass: Africa and Madagascar first (dark gray; 100 to 130 Ma), followed by New Zealand (red; 60 to 80 Ma), then finally Australia, Antarctica, and South America (green; 30 to 50 Ma). Palaeognath-bearing fossil localities from the late Palaeocene and Eocene (*21*, *22*) are represented by circles (flighted taxa) and triangles (flightless taxa). (**B**) Predicted phylogeny of ratites under a model of speciation governed solely by continental vicariance. (**C**) Palaeognath phylogeny as inferred in the present study (see Fig. 1).

netic inference. Elsewhere, avian gigantism and flightlessness are almost exclusively observed in island environments in the absence of mammalian predators and competitors (e.g., the dodo). However, each of the landmasses occupied by ratites (excluding New Zealand) is now home to a diverse mammalian fauna. We suggest that the initial evolution of flightless ratites began in the ecological vacuum after the KPg mass-extinction event and the extinction of the dinosaurs (*12*, *21*). Most mammals appear to have remained relatively small and unspecialized for up to 10 Ma after the KPg extinction (*23*), potentially providing a window of opportunity for the evolution of large flightless herbivores in continental bird lineages. The early Tertiary fossil record supports this interpretation, with geographically widespread flighted palaeognath fossils (Fig. 3A) (*22*) and the appearance of other flightless avian herbivores such as gastornithids in Europe and North America, dromornithids in Australia, and *Brontornis* from South America (*21*). After the early Tertiary, the increasing prevalence of morphologically diverse mammalian competitors is likely to have prevented flightlessness from developing in other continental bird lineages.

The kiwi and tinamous are the only recent palaeognath lineages to not exhibit gigantism, and both taxa co-occur with a second palaeognath lineage (moa and rhea, respectively) that is both much larger and not their closest relative. We suggest that the disparity in size between co-occurring lineages may be a result of the relative timing of arrival of ancestral flighted palaeognaths coupled with competitive exclusion: The first palaeognath to arrive on each landmass monopolized the available niche space for large flightless herbivores and omnivores, forcing subsequent arrivals to adopt an alternative role and remain much smaller. For example, the South American ancestors of the rhea lineage (*Diogenornis*) were already large and flightless at 55 Ma (*21*) when the tinamou lineage originated. The absence of sympatric lineages of small palaeognaths on other landmasses in the recent past may reflect unavailability of alternative niches upon arrival (e.g., due to diversification of herbivorous mammals during the early Tertiary) or subsequent competition with mammals and/or neognathous birds. It is presumably the latter that has necessitated the maintenance of flight in the tinamous.

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ACKNOWLEDGMENTS

This study was funded by the New Zealand Marsden Fund and the Australian Research Council. Grid computing facilities were provided by eRSA (e-research South Australia) and CIPRES (Cyberinfrastructure for Phylogenetic Research). We thank the Museum of New Zealand Te Papa Tongarewa (P. Millener, S. Bartle, A. Tennyson), Natural History Museum Oslo (N. Heintz), and National Museum of Natural History Paris (C. Lefèvre) for samples. We acknowledge D. Penny, M. Phillips, D. Burney and R. Ward for valuable advice and assistance. All data associated with this study are available on GenBank (accession nos. KJ749824 and KJ749825) and DRYAD (doi:10.5061/dryad.2727k).

SUPPLEMENTARY MATERIALS

www.sciencemag.org/content/344/6186/898/suppl/DC1
Materials and Methods
Supplementary Text
Figs. S1 to S9
Tables S1 to S10
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10 February 2014; accepted 21 April 2014
10.1126/science.1251981

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Science

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Science **344** (6186), 898-900.
DOI: 10.1126/science.1251981

Ruffling ancient ratite feathers

Biologists have often pointed to the breakup of the supercontinent Gondwana to explain how related species ended up on far-flung continents, but as new research shows, that explanation doesn't fly with ratite birds. Ratite birds are a lineage of large, mostly flightless birds including the African ostrich, the Australian emu, the South American rhea, the diminutive New Zealand kiwi, and the extinct Madagascar elephant bird. Mitchell *et al.* examined the phylogeny of these birds, adding ancient mitochondrial DNA sequences from the extinct elephant bird. It seems that ratites originated from flighted ancestors who evolved large sizes and loss of flight only after flying to their new homes.

Science, this issue p. 898.

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Chicken Egg Yolk Antibodies (IgY-technology): A Review of Progress in Production and Use in Research and Human and Veterinary Medicine

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Summary — The production of antibodies (Abs) in chickens and the extraction of specific Abs from egg yolk (IgY Abs) are increasingly attracting the interest of the scientific community, as demonstrated by the significant growth of the IgY literature. This review offers detailed and comprehensive information about IgY-technology, including: a) possibilities for hen keeping in accordance with the Three Rs principles; b) new insights into the IgY transfer mechanism from blood to yolk as a biological basis for the technology; c) the comparative characteristics of IgY Abs and IgG Abs; d) the high efficacy of the technique, in view of the extraordinary amount of IgY Ab produced by one hen in one year (between 20g and 40g IgY in total); e) comparisons between the efficacies of IgY Abs and IgG Abs (rabbit, sheep, mouse) in several immunological assays; f) immunisation protocols, as well as the most commonly used IgY-extraction procedures; g) new possibilities for application in human and veterinary medicine, including strategies for the treatment of *Helicobacter pylori* infection or fatal intestinal diseases in children, particularly in poor countries, for reducing the use of antibiotics, and, in Asia and South America, for producing Abs against snake, spider and scorpion venoms; and h) the use of IgY Abs in various fields of research, also taking into consideration recent developments in South America (particularly Argentina and Cuba) and in Asia.

Key words: *chicken antibody, IgY production, IgY prophylaxis, IgY-technology, IgY therapy,* refinement *alternative,* replacement *alternative*.

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Introduction

In 1893, Klemperer (1) first described an experiment in which he demonstrated that the immunisation of a hen resulted in the transfer of specific antibodies (Abs) into the egg yolk (see Table 1). For a long time there was no scientific application for this knowledge, but when animal welfare became a matter of serious ethical concern for the scientific community, the results of Klemperer gained interest. In particular, this development was initiated by the work of Russell & Burch and the publication in 1959 of *The Principles of Humane Experimental Technique* (2). In the subsequent 20 years, more and more researchers recognised the importance of Klemperer's results. Since the 1980s, egg yolk antibodies (IgY Abs) have found a broader application, possibly due to the availability of commercial secondary reagents such as IgY-purification kits, IgY-standards, and of labelled Abs (such as alkaline phosphatase, fluorescein isothiocyanate and peroxidase) specifically against IgY. Since 1996, IgY-technology (introduced by Dr Claus Staak in 1995) has become the internationally accepted term for describing the production and use of IgY Ab (3). In 1996, a European Centre for the Validation of Alternative Methods (ECVAM) workshop recommended the use of IgY instead of mammalian IgG, in order to minimise pain caused by invasive Ab sampling (4). This workshop also provided information about practical aspects of the rearing of laying hens, the immunisation of chickens, the use of adjuvants, and IgY extraction methods. In 1999, the IgY-technology was approved as an alternative method for supporting animal welfare by the Veterinary Office of the Swiss Government (Office Vétérinaire Fédéral; 5). In the meantime, numerous publications have reported on many aspects of IgY-technology (for example, the keeping of chickens, IgY-transfer, IgY-purification, and the use of IgY in diagnosis, therapy and prophylaxis).

Animal Keeping

The conditions for keeping hens differ according to what is possible, for example, under commercial

conditions or in the laboratory. However, they should allow the animals to maintain at least a minimum of typical species behaviour.

At present, there are many recommendations for hen keeping (6–10), and keeping them on the ground or in cages depends on the availability of space or on the requirement for individual egg records. Both these maintenance conditions have advantages and disadvantages, concerning hygiene, egg identification, behavioural disorders (for example, feather picking) and animal care (for a review, see 8). There is a marked reciprocal relationship between the nature of the maintenance conditions (free running hens > keeping on ground > keeping in cages) and the possibility of monitoring the hygiene state of the hens.

Under standard laboratory conditions, the use of a cage unit exclusively designed for keeping chickens is recommended (11). In Europe, the unit usually consists of four separate cages, each one equipped with a laying nest and a perch. To avoid feather picking, the hens can be given hay bundles, and they are supplied with wheat grain and shell-grit in addition to their standard food, in order to enrich the environment.

Erhard *et al.* (12) compared the mean IgY-titres and mean IgY concentrations of immunised hens kept in cages or on the ground. The results of this study clearly showed that both Ab titres and IgY concentrations were higher in hens kept in cages. Currently, there is a discussion about the advantages of using hens kept under specific pathogen free conditions (SPF hens) in comparison to conventionally kept hens. Hommel & Behn (13) showed that an identical immunisation scheme carried out in two White Leghorn hen groups, one kept under SPF conditions and the other under conventional conditions, resulted in comparable Ab titres in both groups. Significant differences were found in the total egg yolk protein concentration and the ratio of specific IgY to total IgY. At present, there are not enough data to convincingly demonstrate the superiority of one keeping condition, at least as far the Ab titre or the specific IgY-concentration are concerned (14).

The Humoral Immunosystem of Birds

Principles of diversification of Ab-specificity

In the animal kingdom, various mechanisms have been developed to protect an organism from invading microorganisms, foreign substances and malignant cells. Such a defence system includes two parts in vertebrates: one is innate (non-adaptive), but non-specific, while the other system is acquired (adaptive) and specific. The acquired immune system is divided into the cellular branch (T and B lymphocytes) and the humoral branch. The immune system of the chicken consists of primary organs (bursa of Fabricius and thymus) and secondary organs (spleen, Harderian gland, lymph nodes, bone-marrow, and lymphoid tissue of the alimentary tract). The bone-marrow is the source of thymic and bursal stem cells. The bursa of Fabricius is the site of differentiation of stem cells into B-cells, whereas the thymus is the site of differentiation of stem cells into T-cells (15–17). The spleen is the organ for plasma cell proliferation and where memory B-cells are located (17).

Three immunoglobulin classes, analogous to mammalian immunoglobulins IgA, IgM and IgG, are found in birds. Historically, IgY, the low molecular weight Ig class present in avian serum and egg yolk was also called IgG, due to its function and concentration in comparison with IgG mammals, including its involvement in secondary immune responses. However, it has become clear that this is inappropriate, especially because of fundamental structural differences between IgG and IgY molecules, which will be discussed below.

Chicken IgA and IgM resemble mammalian IgA and IgM in molecular weight (MW), structure and electrophoretic mobility (15). The DNA sequences of the genes coding for IgY are more similar to those of the genes for mammalian IgE than those for IgG (18). Other results demonstrate a similarity to the mammalian IgA (19). Thus, it can be postulated that IgY is a phylogenetic progenitor of mammalian IgE, IgA and IgG, a theory supported by the fact that IgY, in contrast to IgG, can mediate anaphylactic reactions (15).

Theoretically, there are 10^6–10^8 different Ab-specificities in mammals (17). Since it is not feasible that each Ab-species is coded by one gene, other mechanisms have evolved to provide this Ab diversity, but the mechanisms involved are different in mammals (for example, mouse) and birds (for example, chicken).

Three basic mechanisms produce the diversity of Abs (20, 21): *gene rearrangement* — site-specific recombination; *gene conversion* — non-reciprocal homologous recombination, whereby modifications in an acceptor gene are copied from a homologous donor sequence (templated modification); and *somatic mutation* — single (or double) nucleotide substitution that is not derived from a pre-existing sequence (untemplated modification).

In mammals, Ab diversity is mainly produced by the rearrangement of various gene segments to produce the hypervariable part of the antibody, and additionally, by somatic mutation. In this way, the production of millions of Ab specificities is possible (Figure 1). In chickens, Ab diversity is mainly achieved by gene conversion, by V-J flexible joining, and also by somatic point mutation, as in mammals (22–25). In contrast to mammals, in chickens there is only one functional V_H or V_L

Table 1: Two studies demonstrating the protective effect of specific IgY against intoxication

a) Repeated immunisation (five immunisations at intervals of 5–15 days each) of chickens with a virulent tetanus bouillon culture (i.p. injection of increasing concentrations from 5cc to 30cc in steps of 5cc). After 4 weeks, preparation of an egg yolk extract (11cc egg yolk mixed with 10cc saline). Treatment of mice with this extract (i.p.).

4 mice	**2 mice**	**2 mice**	**2 mice**
1ml extract	0.5ml extract	0.25ml extract	0.0ml extract (saline)
Next day, administration of a lethal dose of tetanus bouillon culture (lethal dose 0.001cc, administered 0.0015cc s.c.).			
live	live	dead	dead

b) Repeated immunisation (four immunisations at intervals of 2 weeks) of chickens with bacterial staphylococcal enterotoxin B (250–500μg SEB i.m.). After 8 weeks, preparation of pure IgY (by immunoaffinity chromatography). Administration of IgY 10mg/kg or buffer (i.m.), administration of toxin 5 × LD50 as aerosol (during the experiment the monkeys were anaesthetised).

4 monkeys IgY 20 minutes before toxin challenge	**4 monkeys** IgY 4 hours after toxin challenge	**1 monkey** buffer 20 minutes before toxin challenge	**1 monkey** buffer 4 hours after toxin challenge
live	live	dead	dead

a) Experiment of Klemperer 1893 (1). Ueber natürliche Immunität und ihre Verwerthung für die Immunisierungstherapie.

b) Experiment of LeClaire et al. *2002 (206). Protection against bacterial staphylococcal enterotoxin B by passive vaccination.*

The table demonstrates that results which are more than 100 years old are the forerunners of similar recent studies. Such investigations are necessary, because of the possible use of highly toxic substances in biological warfare.

i.m. = intramuscular; i.p. =intraperitoneal; s.c. = subcutaneous.

gene, but in addition there are approximately 25 so-called pseudo-V genes, which lack the usual transcription regulatory and signal-recognition sequences. From these pseudo-V genes, 10 to more than 120 base pairs are transferred to the functional V gene. This process starts approximately 15–17 days after the immature B-cells migrate to the bursa of Fabricius to become mature and competent B-cells.

Molecular structure of chicken IgY

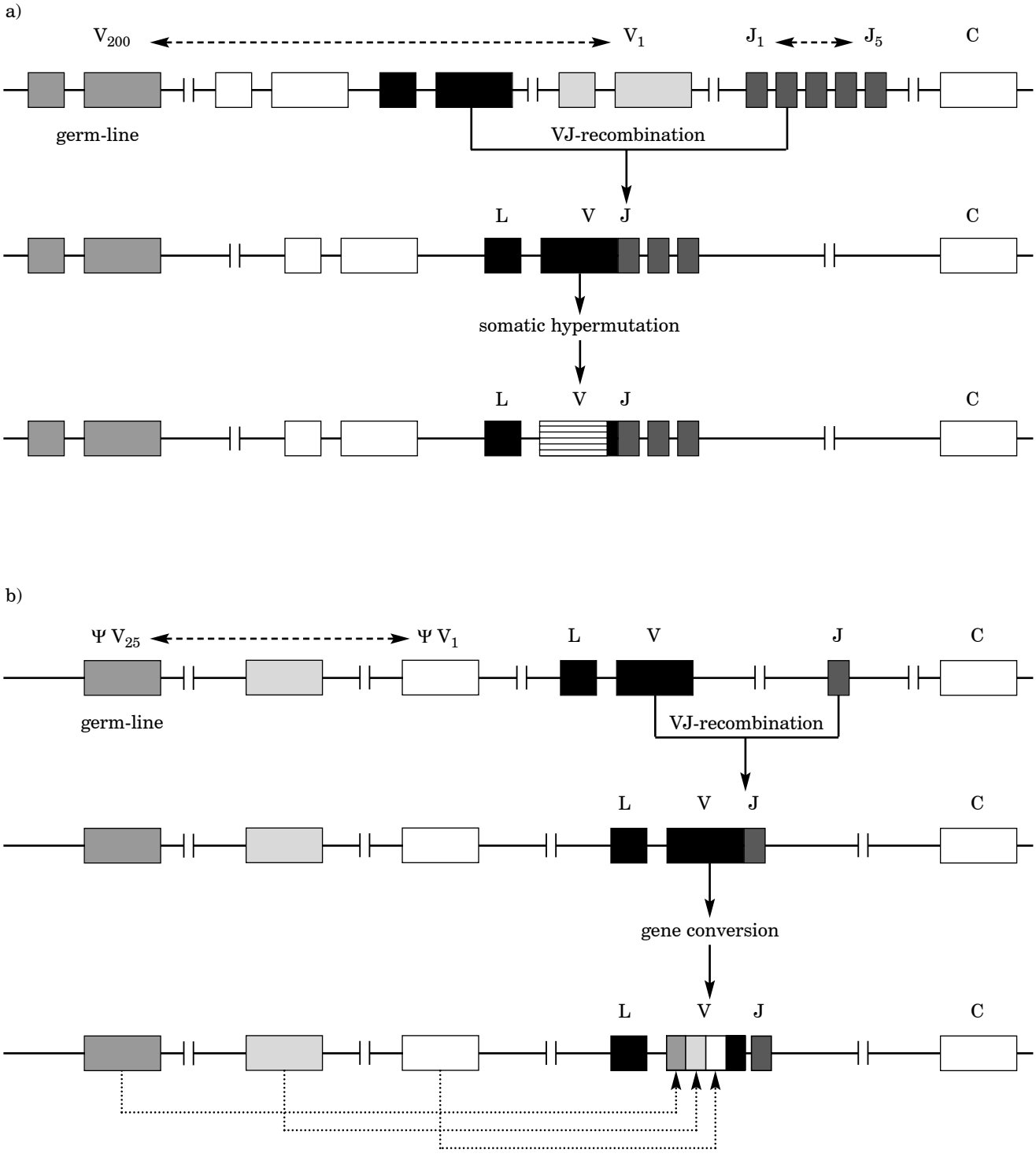
The general structure of the IgY molecule, consisting of two light and two heavy chains, is comparable to that of mammalian immunoglobulins. The heavy chain is indicated by the Greek letter Y or υ, and contains one variable domain and four constant domains, in contrast to the three constant domains of the IgG heavy chain. The MW of IgY was found by mass spectrometry to be 167,250Da (that of IgG is about 160,000Da; 26). Polyacrylamide gel electrophoresis gave somewhat different results (27). The light chain consists of one variable and one constant domain (MW, 18,660Da), the heavy chain has a MW of 65,105Da, and the Fab fragment has a MW of 45,359Da. There is some homology between the Cυ3 and Cυ4 domains and the Cγ2 and Cγ3 domains of mammalian IgG, whereas the Cυ2 domain is believed to represent the hinge region of IgG and is much less developed in IgY (28). The less developed hinge region of IgY may result in a reduced flexibility of the Fab moiety, which, in turn, may be the reason for some differences between IgY and IgG concerning antigen epitope recognition (see also 18, 29, 30).

As for IgG, the Fc part of IgY is the site of most biological effector functions. It contains two carbohydrate side-chains, in contrast to only one in IgG (see Figure 2).

Transfer of IgY into egg yolk

According to Rose *et al*. (31), minor quantities of IgA and IgM are transferred to the egg white from the plasma cells of the oviduct. Lösch *et al*. (32, 33) confirmed these results. In contrast to these findings, Yamamoto *et al*. (34) demonstrated substantial amounts of IgM and IgA in egg yolk and of IgY in egg white. Recent data show that IgY is exclusively transferred to the yolk by receptor-mediated

Figure 1: Mode of antibody diversification in mouse and chicken

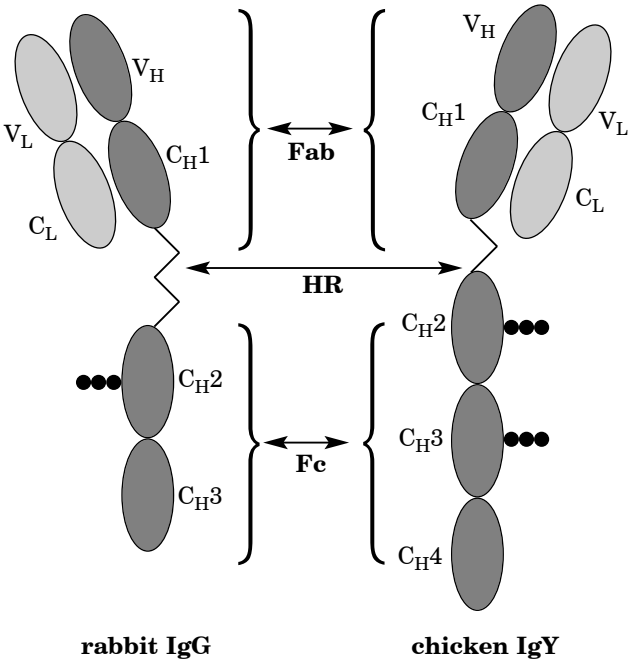


a) Murine light chain locus; b) chicken light chain locus.

V = gene segments coding for the variable domain ($V_{1–200}$ indicates the number of gene segments); J = gene segments coding for a certain part of the V-domain; C = gene segments coding for the constant domain; L = leader sequence; ψV = pseudo V-gene segments lacking the usual transcription regulatory and signal recognition sequences.

The figure is adapted from Bezzubova & Buerstedde (20).

Figure 2: Molecular structure of chicken IgY and rabbit IgG



V = variable domain of the light chain (V_L) and the heavy chain (V_H); C = constant domain of the light chain (C_L) and the heavy chain (C_H); HR = hinge region. The black points symbolise carbohydrate chains.

The figure is adapted from Shimizu et al. *(28).*

processes (35, 36). The amount of IgY transferred is related to the IgY serum concentration, and it appears that all IgY populations are transferred (36).

Mohammed *et al.* (35) and Morrison *et al.* (36) showed that an intact Fc part and hinge region are both essential to accomplishing the transfer of IgY from serum to egg yolk. The Fc-associated carbohydrate side-chains are not of special interest in this context. Apparently, two regions are of particular importance, at the interface between Cυ2 and Cυ3, residues 251–254 (*Leu-Tyr-Ile-Ser* [LYIS]), and at positions 429–432 within Cυ3 (*His-Glu-Ala-Leu* [HEAL]). All immunoglobulins transported to the yolk have the HEAL sequence. They found that murine IgG2b, with the sequence HEGL (*His-Glu-Gly-Leu*), and chicken IgA, with the sequence HDGI (*His-Asp-Gly-Ile*), were not transported to the yolk. In contrast, human IgA has the sequence HEAL.

The transovarial passage of IgY takes approximately five days (35). The half-life of the circulating IgY of an adult chicken is approximately 36 to 65 hours (37). This is much shorter than the half-life of sheep IgG, which is about 15 days (38). According to various authors, the specific serum Abs are transported to the yolk with a delay of about 5–6 days (37) or 3–4 days (38). The exact "lag" curve probably depends upon the number of eggs undergoing their final processing, during which IgY is transferred to the yolk together with other selected proteins (37). The amount of IgY transferred seems to be independent of egg size (39, 40).

Depending on the assays used and their sensitivities, total IgY concentration is estimated to be 100–200mg per egg. There is a controversy concerning yolk IgY and serum IgY concentrations. Some authors reported no differences between them, whereas others detected a higher IgY concentration in the yolk (for example, 1.23 times more in the yolk than in the serum; 38). The yolk IgY concentration varies significantly among individuals (for example, 3–7mg/ml; 41) and genetic lines or breeds (for example, Single Comb White Leghorn 2.2 ± 0.4 mg/ml, SLU-1329 2.0 ± 0.5 mg/ml, Rhode Island Red 1.7 ± 0.5 mg/ml; 42, 43). According to our findings, IgY has a significant biorhythm, apparently in the septadian range (Figure 3; 44).

Physicochemical parameters of chicken IgY

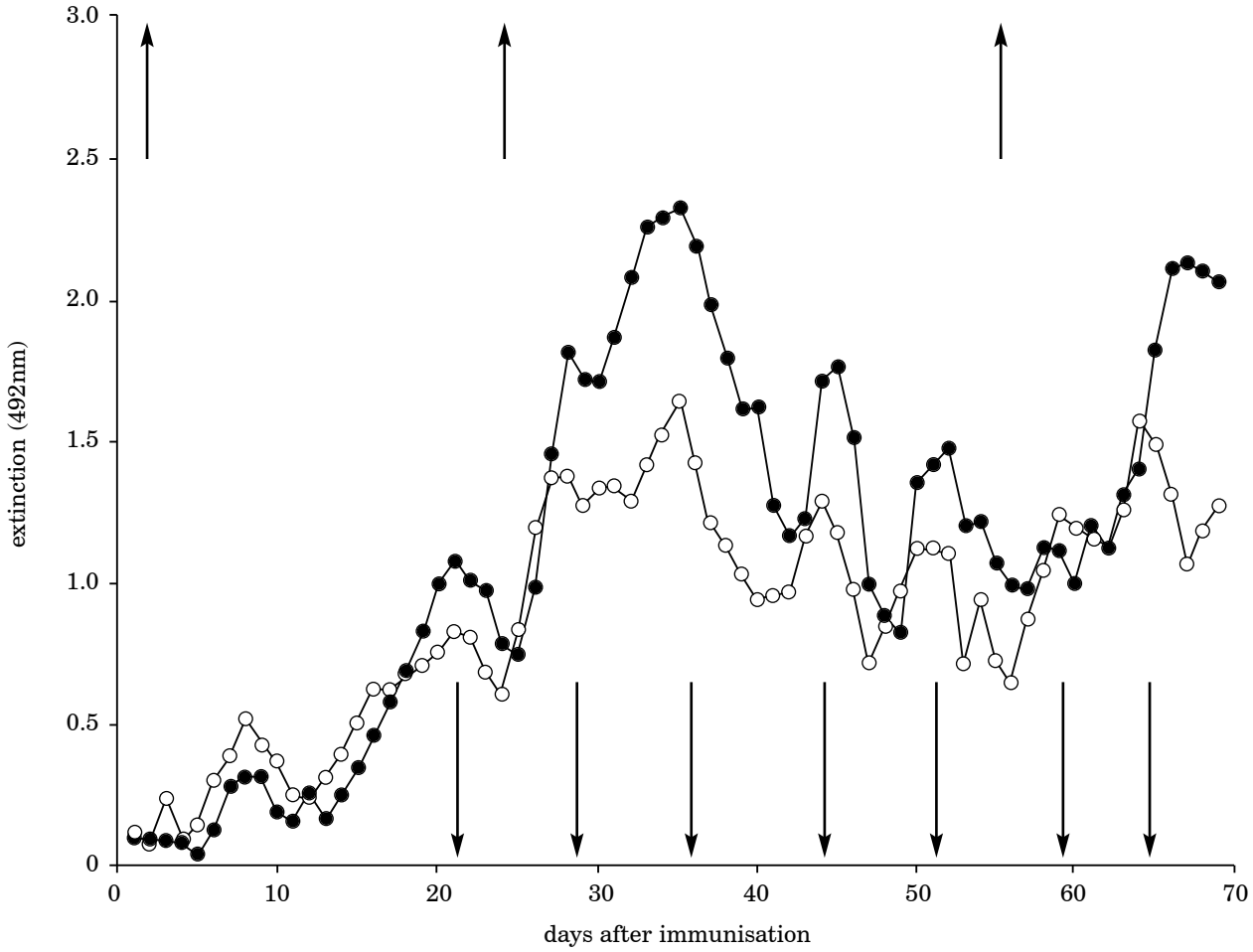
The isoelectric point (pI) of IgY is in the range of 5.7 to 7.6, whereas that of IgG lies between 6.1 and 8.5 (45, 26). The most hydrophobic moiety of the Ab molecule is the Fc fragment. Since the Fc fragment of the IgY is bigger than that of the IgG, the IgY molecule is more hydrophobic than the IgG molecule. It has been demonstrated that this property might be useful for achieving a stable adsorption of IgY onto latex particles (45). Further, it could be demonstrated that, preferentially at pH 8, the Fc part of IgY is firmly bound to the latex particles (46); hence, IgY coated to latex microspheres retains its specific binding activity.

Temperature and pH stability of IgY

The oral use of the IgY Abs as components of functional food makes it necessary to investigate the stability of IgY in relation to pH, as well as molecular resistance to proteolytic cleavage under conditions met during passage through the stomach and the small intestine. Heat stability is also of importance, since temperatures of 70–90°C are necessary for the production of egg powder.

According to Shimizu *et al.* (28), IgY is more sensitive than rabbit IgG to acid denaturation, and more rapidly loses its activity between pH 3 and pH 4. Similar results were presented by Lee *et al.* (47), Hatta *et al.* (48) and Lösch *et al.* (33). The addition of 50% sorbitol was able to almost completely suppress acid-induced IgY inactivation at pH 3 (47).

Figure 3: Time-dependent changes in antibody (Ab) titre after immunisation of two chickens with mouse IgG



●, ○ = *chickens.*

The arrows at the top indicate immunisations, and the arrows at the bottom indicate the distance between peaks of the titre development curve independent of boost immunisations. Note that the mean distance between the arrows is in the range of 5–10 days (i.e. according to a septadian biological rhythm), and that there is a close correspondence between the two Ab titre curves. The Ab titres were measured by an ELISA. Extinction at 492nm means a staining reaction (the horseradish peroxidase reaction).

The figure is adapted from Olbrich et al. *(61).*

Schmidt *et al*. (49) and Hatta *et al*. (50), who extensively investigated the peptic cleavage of IgY, found that there was a high loss of specific IgY activity during passage through the stomach and due to the activities of the pancreatic proteases, trypsin and chymotrypsin. The addition of alkaline (sodium bicarbonate) or protein rich (egg white, egg yolk) solutions strongly increased the resistance of IgY to acid or proteolytic inactivation. According to Shimizu *et al*. (28) and Reilly *et al*. (51), IgY is less resistant than bovine IgG to pepsin digestion, but more resistant to the activities of trypsin and chymotrypsin (see also, 48).

Jaradat & Marquardt (52) demonstrated the heat stability of IgY up to 60°C, which could be increased to 70°C by the addition of sugars, such as 30% sucrose, trehalose or lactose, or egg yolk. According to Shimizu *et al*. (28) and Hatta *et al*. (48), IgY is stable at temperatures ranging between 60°C and 70°C. Lösch *et al*. (33) were able to demonstrate that, when eggs were cooked in boiling water for 6 minutes, IgY concentration did not decrease.

It is now possible to design special IgY formulations in order to avoid IgY-loss due to low pH, which ensure Ab release only at the desired site of action (53).

Immunisation of the Chicken

General remarks

Antibody development and production as a result of immunisation are not very predictable. At least four variables influence the immune response of the immunised chicken: the antigen (dose, MW), the type of adjuvant used, the route of application, and the chicken itself (such as keeping conditions, age, breed, effect on egg laying capacity). Recommendations on the immunisation of chickens are given in Table 2.

Antigen dose

The antigen dose used for immunisation can significantly influence the resulting immune response and Ab titre. Behn *et al*. (54) achieved better results when injecting 0.1mg of mouse IgG, instead of 1.0mg. Schwarzkof *et al*. performed detailed investigations on the influence on the resulting Ab titre of antigen structure (low or high MW) and concentration, and the use of adjuvant (55). Good results were achieved with antigen concentrations ranging between 10µg and 1mg, and this was also reported by other researchers (56).

Similar studies have been conducted by Larsson *et al*. (57), who immunised groups of three hens with 100µg, 10µg, 1µg or 0.1µg of bovine serum albumin (BSA) or human insulin, with an initial immunisation followed by three booster injections given at fortnightly intervals. There were no significant differences between the use of 100µg, 10µg or 1µg BSA as far as the plasma or yolk Ab titres were concerned. Surprisingly, an acceptable response was also observed in one chicken when only 0.1µg BSA per injection was used. Immunisation with human insulin did not result in any significant differences between the hens immunised with either 100µg or 10µg antigen, and no response was detected when 1µg was administered.

Rodolfo Sarmiento (unpublished results) found that the injection of 5mg or 2.5mg human albumin resulted in a suppression of the Ab titre development, in contrast to the good responses that were elicited when the albumin was administered at a concentration of 1mg or 0.5mg (Figure 4).

For each antigen, the optimal dose required for a successful immunisation has to be tested experimentally. As a rule of thumb, smaller antigens such as peptides (MW below 10kDa) should be coupled to carriers (for example, bovine serum albumin or keyhole lympet haemocyanin).

Use of adjuvants

The production of polyclonal Abs is facilitated by the use of modulators which stimulate B-cells (i.e. adjuvants). Although this stimulation is independent of the antigen and is therefore non-specific, it improves the magnitude of the immune response. However, the immunisation of hens without the use of any adjuvant also results in acceptable Ab titres (58). There are many adjuvants, which differ in their chemical characteristics, their efficacy in stimulating the immune system, and their secondary side-effects in the inoculated hens (for a review, see 59). According to our experience, Freund's complete adjuvant (FCA) remains the most effective adjuvant, but, unfortunately, this advantage is linked to its tissue-damaging potency. Freund's incomplete adjuvant (FIA) is less effi-

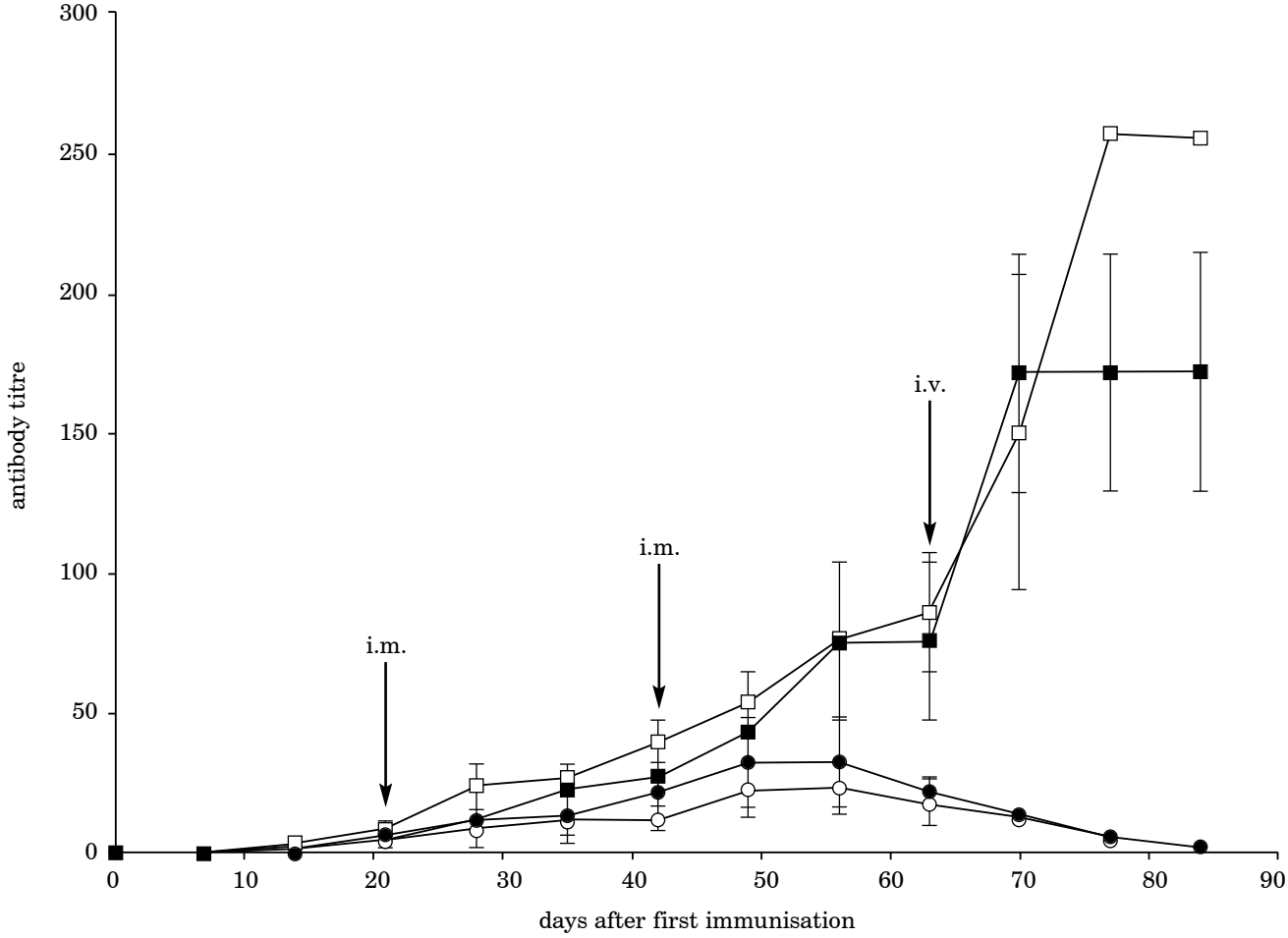
Table 2: Recommendations for chicken immunisation

		Dose, volume, immunisation interval		Comments
Antigen		0.10–1.00mg		sometimes only 10µg
Adjuvant		FIA	0.10–0.25ml	usually i.m. or s.c.
		Specol	0.5ml	s.c.
		PCSL	250µg	preferably s.c.
		FCA	0.10–0.25ml	only with weak immunogens
Injection:	volume	0.5ml–1ml		
	interval	4–8 weeks		
	number	2 (more if necessary)		
	route	i.m., s.c. or i.v.		

FCA/FIA = Freunds complete/incomplete adjuvants; PCSL = $Pam_3Cys\text{-}Ser\text{-}(Lys)_4$*; i.m. = intramuscular; i.v. = intravenous; s.c. = subcutaneous.*

The data were modified according to Schwarzkopf et al. *(55). Due to serious side-effects, FCA should be used only in special cases (for example, together with only weakly immunogenic antigens).*

Figure 4: Development of antibody (Ab) titre after immunisation of chickens with human albumin



● = *5mg;* ○ = *2.5mg;* ■ = *1mg;* □ = *0.5mg.*

The chickens were immunised with human albumin at different concentrations, as indicated. The arrows indicate immunisations. The Ab titre was measured by counterimmunoelectrophoresis, with three replicates. The number (Y-axis) indicates the Ab dilution that gave a visible precipitate with a constant antigen dose.

cient than FCA, but results in lower side-effects when it is carefully mixed to produce a proper colloidal emulsion. One frequently cited reference suggests that chickens show higher resistance to tissue damaging potency than rabbits (60), but there are data which contradict this finding (59, 61). Future research should focus on the search for new adjuvants, which show the same high efficacy as FCA, but do not cause serious side-effects in the birds (61–63).

Mode of antigen application

The most common route for antigen injection in hens is the intramuscular (i.m.) route. Extensive studies by Schwarzkopf *et al*. (55) compared immunisation by the i.m. or the subcutaneous (s.c.) routes. It could be shown that the s.c. antigen injection provoked a higher Ab titre than injection via the i.m. route. The intravenous route (i.v.) should only be used without adjuvants (58). According to our experience, a combination of i.m. antigen injections with a final i.v. injection, frequently significantly increased the Ab titre (Figure 4). However, i.v. injection (without adjuvant) must be performed very slowly (approximately 500µl over 15 minutes) to avoid an anaphylactic reaction. Antigen inoculation via the intraperitoneal (i.p.) route was used by Klemperer in 1893 (1), but today it is rather unusual (see 33). Also, in a recent investigation

(64), it was shown that oral immunisation is possible. At days 1, 14 and 33 of the immunisation protocol, two hens per group were orally given 100μg of human IgG, together with various adjuvants (Cholera toxin B-subunit, dimethyl dioctadecyl ammonium bromide or Softigen®) carried on poly (D,L-lactide-co-glycolide) microspheres. Significant Ab titres were provoked by using Softigen® and Cholera toxin B-subunit, but these titres were considerably lower than those in i.m. inoculated hens. Klipper *et al.* (65, 66) demonstrates significant Ab titres against protein antigens (for example, BSA) in the serum and bile of 2-week-old chickens after repeated oral administration. Scwarzkopf *et al.* (55) has published the outcome of a comprehensive study that compared the specific Ab titres after injections of the same antigen via the i.m., s.c. or i.v. routes, given either separately or combined, and with or without the addition of various adjuvants.

Interval between immunisations

The success of an immunisation depends on several variables, including the intervals between the first and second and subsequent immunisations. Many immunisation protocols are available, with recommendations which include inoculations at days 0, 14 and 28 (67, 68) or once a week for 7 consecutive weeks (69). Several authors immunise the chicken at 10-day intervals (70–72), but the general recommendation states that the interval between the first and second antigen injections should be at least 4 weeks. This reflects immunological memory, which must be given time to develop (17). Messerschmid *et al.* (73) also support this concept, and immunised hens at day 0, week 10 and week 15, and achieved very high titres in the range of 1:160,000. Hlinak *et al.* (74) and Schwarzkopf *et al.* (55) reported similar results, and recommended the application of a late boost. Pichler (75) demonstrated a significantly higher Ab titre by prolonging the boost interval from 14 to 42 days. There is evidence that the application of frequent immunisations within short periods of time results in depression, rather than activation, of the immune response (69).

Influence of immunisation on egg laying capacity

According to our own observations and the experience of several other research groups, the laying performance of hens is normally only slightly influenced by a simple antigen injection (8, 76, 77), but laying capacity may decrease, depending upon the type of antigen injected. For example, Schade *et al.* (77) and Schniering *et al.* (77, 78) immunised hens with solutions containing antigens (somatic, secretoric-excretoric) from an intestinal parasite (*Ascaris suum*). The laying of the injected hens decreased or completely stopped for up to 3 weeks, probably because of toxic substances which originated from the intestinal parasites. In addition, the influence of FCA and FIA on laying capacity has been investigated by several research groups. It was found that the use of FCA caused a significant depression in egg laying frequency in SPF Rhode Island red chickens (79), but had only a minor and transient effect on (76), or even failed to significantly influence, egg laying in White Leghorn hens (8). The difference between these results was probably caused by differences in experimental conditions.

IgY Ab titre development

After the immunisation of a mammal, such as a rabbit, the immune system mounts a primary response, followed by a secondary response elicited after injecting the second dose of the same antigen. The two phases have different characteristics. During the primary response, mainly IgM Abs are synthesised, and there is only a low and transient increase in the Ab titre, while, during the secondary response, mainly IgG Abs are found at a stable, high titre lasting for several weeks.

A similar response pattern has been observed in the chicken, although there are some differences. The IgY Abs appear in chicken serum approximately 4 days after the inoculation of the antigen, reach a maximum titre at days 6 to 8, and decline thereafter. The Ab titre can be strongly increased by booster immunisations. There appear to be two different pathways in the secondary immune response. According to the results of Patterson *et al.* (37), some chickens respond with Ab kinetics similar to those of mammals, whereas others respond to the same immunisation protocol with an increase in the Ab titre following the first immunisation, but fail to render any significant change after the second.

The most frequently observed Ab titre kinetics in chicken after the first immunisation show a transient increase in IgY in the first phase, and the second phase (booster immunisation) is characterised by an initial increase in the Ab titre within approximately 10 days, followed by a plateau for a further 10 days and a decline thereafter (Figure 3). The development of the Ab titre is probably a consequence of the relatively short half-life of IgY in comparison to that of IgG. In contrast, some authors have demonstrated that the Ab titres remain high and stable for several weeks (7, 13, 48, 54). So far, the reasons for these two differences in the kinetics of Ab production remain unclear.

Comparison of the Properties of Chicken IgY Antibodies and Mammalian IgG Antibodies

Ab titre development

Tu *et al*. (68) compared Ab titre development in rabbits and chickens immunised at weeks 0, 2, 4 and 6 with bovine lactoferrin. Using an ELISA, they could demonstrate that the Ab titre was as high as 1.68×10^8 in both species by the eighth week after the initial immunisation. The Ab titre remained more stable in the chicken, for a period of 16 weeks after the initial immunisation.

Clark *et al*. (80) found that, after immunisation with ochratoxin A, the Ab titre in the serum of rabbits was ten-fold higher than that in the serum of hens. In the chickens, the Ab titre increased within 100 days and remained stable for up to 166 days. Woolley & Landon (38) observed similar results after immunising sheep and chickens with human interleukin 6 (IL-6). In addition, they observed that six chickens developed a "classical" immune response, characterised by a strong response to the second immunisation. In contrast, four other chickens developed a strong immune response after the first vaccination, but later failed to respond to the second dose. Bollen *et al.* (81, 82) also compared Ab titre development in rabbits and chickens, and demonstrated a higher titre in rabbits (by a factor 1.5 to 2), although Ab productivity was higher in the chickens (by a factor of 5 to 10). A stable Ab titre could be achieved in both species for a period of 50 weeks.

Hatta *et al*. (48) compared Ab titre development in rabbits and chickens immunised against human rotaviruses (Wa strain, serotype 1, and Mo strain, serotype 3). Rabbits produced an anti-Wa neutralisation titre of 1:27,000 and an anti-Mo titre of 1:4000, in contrast to chickens, which produced an anti-Wa titre of 1:13,000 and an anti-Mo titre of 1:15,000. The neutralisation titre remained constantly high in chickens over a period of 50 weeks. Furthermore, overall Ab productivity was 15 times (anti-Wa) and 120 times (anti-Mo) more effective in chickens than in rabbits.

Reddy *et al*. (83) produced Abs in chicken (serum Abs) and mice against avian reovirus (strain S1133). The ELISA Ab titre produced by the hens (1:131,072) was 15 times higher after the third immunisation than that obtained in the mice (1:8192).

Ab avidity

There are a number of reports in the literature which show that, in principle, there are no significant differences between the avidities (81, 38) and affinities (84) of IgY and rabbit IgG.

Ab sensitivity and specificity

Ohnishi *et al*. (70) developed an ELISA for the detection of hepatocyte growth factor or scatter factor (HGF or SF) in human serum and urine, and compared specific Abs from the chicken and the rabbit. The detection limit in the rabbit Ab assay was 2pg/ml, in contrast to 20pg/ml in the chicken assay. Non-specific binding was lower in the chicken Ab assay than in the rabbit Ab assay. The detection limit for a commercially available HGF test system is only 100pg/ml.

Di Lonardo *et al*. (85) produced Abs against the E7 oncoprotein of human papilloma virus type 16 (HPV16) in rabbits and chickens. Mapping the epitopes with eight HPV16E7 peptides revealed that the chicken Abs reacted with all eight peptides, whereas the rabbit Abs recognised only two epitopes. In immunohistochemistry tests, the chicken Abs were highly effective, in contrast to the rabbit Abs, which failed to provide results with this technique. In this study, chicken Abs were clearly superior to rabbit Abs in terms of epitope recognition and efficacy in immunohistochemistry studies.

We have also compared the sensitivities and specificities of chicken and rabbit Abs directed against several cholecystokinin (CCK) derivatives (86, 87). In general, rabbit Abs gave good signals with longer CCK derivatives (eight amino acids), whereas chicken Abs also recognised short CCK molecules (4–5 amino acids). The Abs of both species were useful in establishing a highly sensitive radioimmunoassay (RIA) for the quantification of CCK-8 (IC50 chicken Ab: 0.8 logfMol/incubate; IC50 rabbit Ab: 0.5 logfMol/incubate). Surprisingly, the sensitivities of the two RIAs were comparable, whereas the working dilutions were different by a factor of 100 (rabbit Ab 1:100,000, chicken Ab 1:1000).

Straumann-Kunz *et al*. (88) compared mouse monoclonal Abs (mAbs) directed against *Chlamydiae* with the corresponding chicken Abs, and found that, when using chicken Abs in immunohistochemical assays, the background was lower than with the mouse mAbs.

Bauwens *et al*. (89) compared the sensitivities of chicken and rabbit RIAs for the quantification of 1,2,5-dihydroxyvitamin D in blood serum or plasma. The detection limit for the chicken RIA was 5pg/tube, and that for the rabbit RIA was 2pg/tube.

Clark *et al*. (80) compared the detection limits of rabbit and chicken ELISAs for measuring ochratoxin (a highly toxic, secondary fungal metabolite). With the rabbit assay, a detection limit of 3µg/kg could be achieved, in contrast to 50µg/kg in the chicken assay. By optimising a similar chicken ELISA for the detection of another mycotoxin (Zearalenone), Pichler *et al*. (75, 90) obtained a detection limit of 17µg/kg. Clark *et al*. (80) observed pH-dependent specificity (lower specificity at pH 6,

higher specificity at pH 8) and sensitivity (maximum at pH 7) with chicken Abs. Doth *et al*. (91) compared the sensitivities of two chicken Abs, four mouse mAbs and one commercial goat Ab, with specificity against troponin I. In comparison to the four mouse mAbs, the sensitivities of the chicken Abs were significantly higher. The chicken Abs were not as sensitive as the highly sensitive goat Ab obtained after extensive Ab screening.

Cipolla *et al*. (92) produced Abs against *Campylobacter fetus* in chicken and rabbits. Both types of Ab were evaluated by using direct immunofluorescence in two laboratories. It could be demonstrated that both the Abs had a comparable efficacy in terms of specificity and sensitivity, although the use of the chicken Ab led to a lower background signal than that for the rabbit Ab.

Interestingly, IgY specifically agglutinates *Salmonella* in the same way as does a rabbit antiserum. Terzolo *et al*. (93) showed that anti-*S. enteritidis* IgY can be used to specifically agglutinate the bacteria (somatic antigens as well as flagellar antigens), and that this reaction is highly specific and comparable to that with the standard rabbit antiserum. Therefore, it could be possible, in future, to replace rabbits with hens for the production of diagnostic serum for the identification of *Salmonella* serovars according to the Kauffman-White scheme.

Al-Haddad *et al*. (94) used immunohistochemistry to demonstrate the efficacy of a chicken Ab directed against the tumour marker, psoriasin (S100A7). The chicken Ab was highly specific and had an excellent performance in paraffin-embedded tissues. On the contrary, a commercial anti-S100 rabbit Ab was less specific.

Knecht *et al*. (95) compared the efficacies of chicken and rabbit Abs directed against peptides corresponding to two amino acid sequences of rat and human dihydroorotate dehydrogenase. They concluded that the avian Ab could be considered to be a superior alternative to the mammalian Ab.

Pelosi *et al*. (71) successfully used specific chicken Abs for epidemiological studies concerning the incidence of Abs against Norwalk-like viruses (genogroup 1 and 2) in the population of Verona, Italy.

Hlinak *et al*. (96) produced chicken anti-*Bordetella bronchiseptica* Abs, and compared their efficacies with both an ELISA and by immunohistochemistry. It could be shown that there were no differences in specificity or sensitivity.

Krief *et al*. (97) immunised chickens and mice with β-ketoalcohol (a key intermediate in the synthesis of chrysanthemic acid), and found out that the resultant chicken Ab very specifically recognised the whole structure of the hapten, including a side-chain. They concluded that chicken Abs obviously recognise the antigen in a different manner from mouse Abs, and that chickens are a valuable substitute for mammals for Ab production.

Recently, Rodolfo Sarmiento (unpublished results) observed a lower cross-reactivity for an anti-human albumin IgY Ab with blood serum samples from other mammalian species, as compared to a similar goat Ab.

Gerl *et al*. (98) compared the specificities of two chicken Abs, two mouse mAbs and two rabbit Abs with the amino-terminal propeptide of bovine procollagen type III (PIIINP), which is a marker for fibrotic processes. It could be shown that only chicken Abs were able to recognise PIIINP in both rat and human serum.

Danielpour & Roberts (99) developed an ELISA for the quantification of transforming growth factor β3 (TGF-β3) by using a mouse mAb directed against TGF-β as a capture Ab and the chicken Ab as the detection Ab. The staining was performed by using an AP-linked goat anti-chicken Ab. This assay was confirmed as being very specific and highly sensitive, with a detection limit of 2pg.

IgY Extraction

The choice of a suitable IgY purification method is influenced by scale of purification (laboratory or industrial), cost effectiveness, technology, and impact on the environment (waste management). Various IgY extraction methods were reviewed in detail by De Meulenaer & Huyghebaert (100, see also 101–108). In general, these methods can be divided into three principal groups:

1. *Precipitation methods:* involving ammonium or sodium sulphate (for example, 101, 102, 104, 109), polyethyleneglycol (PEG; 110–112, 113), caprylic acid (114) and carrageenin (115).

2. *Chromatographic methods:* affinity chromatography (68, 116–119), ion exchange chromatography (120), hydrophobic interaction chromatography (121), thiophylic interaction chromatography (122), and gel-filtration chromatography (120).

3. *Ultrafiltration* (123).

The purity of an IgY preparation can be increased by combination; for example, PEG precipitation can be combined with affinity chromatography.

In some instances, depending on the final application, a water extract of IgY is sufficient to achieve good results (124, 125). To obtain such an extract, the yolk is homogenised with buffer or water at a ratio of 1:9, and frozen for approximately 24 hours, followed by slow thawing at 4°C (120). Slow thawing is an important factor for the appropriate separation of the aqueous and lipid parts, followed by simple gravity filtration.

In recent years, Polson's PEG precipitation method (110, 111) has become the most commonly

used and most effective procedure (100, 108). This method is therefore presented in detail in Figure 5. A simple and frequently used procedure is the water dilution method, described by Akita & Nakai (101, 103), which is shown in Figure 6. Trouble-shooting advice and protocols for other IgY purification methods can be found in the IgY manual (120).

IgY purification by means of protein A (*Staphylococcus aureus*) or protein G (*Streptococcus* species, strains C and G) affinity columns is not possible, since these proteins have no binding site for IgY (see Table 3).

An Argentinean group screened several Gram-positive bacteria (*Bacillus*, *Corynebacterium*, *Listeria*, *Staphylococcus* and *Streptococcus*) for IgY binding properties. Several unclassified bacteria, randomly chosen from soil isolates, were also included in this study. Among the soil isolates, one atypical strain was found, which belongs to the *Serratia liquefaciens* group (126) and which has strong non-immunological IgY-binding. At present, several studies are in progress to develop a new chromatographic IgY purification procedure, based on proteins purified from *S. liquefaciens*.

Preservation of IgY Solutions

A temperature of 4°C can be recommended for the storage of IgY antibodies over a period of months to a few years, with the addition of 0.02% NaN_3, 0.03% w/v thimerosal or 50µg/ml gentamicin as an inhibitor of bacterial growth. Freezing at –70°C can cause the loss of up to 50% of IgY activity (120), so storage at –20°C is preferable.

Two important points should be considered when storing IgY solutions with sodium azide: a) sodium azide can inhibit horseradish peroxidase (HRP) activity, especially when primary antibody is used at dilutions lower than 1:1000; and b) IgY solutions stored with sodium azide should be dialysed before the labelling of IgY antibodies with, for example, HRP. In order to avoid the effects of repetitive thawing/freezing of IgY, 10–50% (v/v) glycerol can be added.

According to our observations, IgY solutions show a slight tendency toward self-aggregation, but this does not seem to influence the overall IgY Ab activity. As is also found with mammalian IgG antibodies, the activity of highly purified IgY decreases faster than that of partially purified IgY (own observations, and A. Hlinak, personal communication).

The Production of Chicken mAbs

Matsuda *et al*. (127) and Nishinaka *et al*. (128) successfully produced chicken mAbs by using the chicken B-cell line, MuH1. These research groups were able to generate chicken mAbs with specificity for the N-terminal of the human prion protein. The production of chicken mAbs has the advantage of combining the properties of mAb production and the use of Ab specificities characteristic of avian Abs. Therefore, future research work on IgY technology should be focused on the development of chicken mAbs.

Advantages of the Use of IgY

Animal welfare

The most important aim of animal welfare is the reduction of painful manipulations. IgY technology

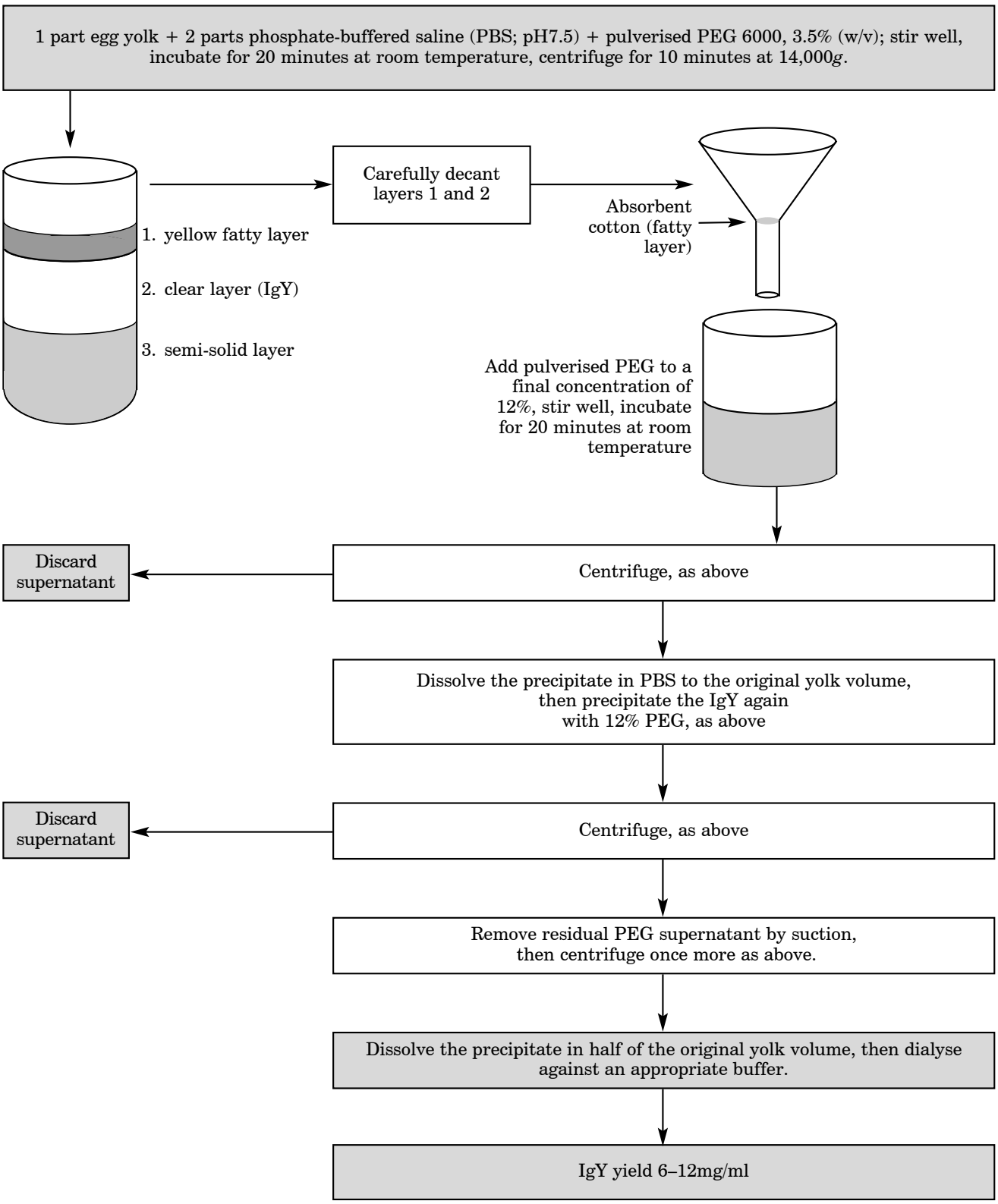
Table 3: Characteristics of mammalian antibody compared with avian antibody

	Rabbit IgG	Chicken IgY
Antibody sampling	invasive	non-invasive
Antibody amount	200mg/40ml blood	50–100mg/egg 5–7 eggs/week
Antibody amount/month	200mg	approximately 1000–2800mg
Interference with mammalian immunoglobulins (rheumatoid factors)	yes	no
Interference with HAMA	yes	no
Interference with mammalian complement	yes	no
Protein A/G binding	yes	no

Note the difference in antibody output, which is the basis for new applications in human and veterinary medicine, such as in the treatment of intestinal diseases, caries and intoxications (for example, as a result of snake bites or food contamination). See also, Zhang (213).

HAMA: human anti-mouse antibody.

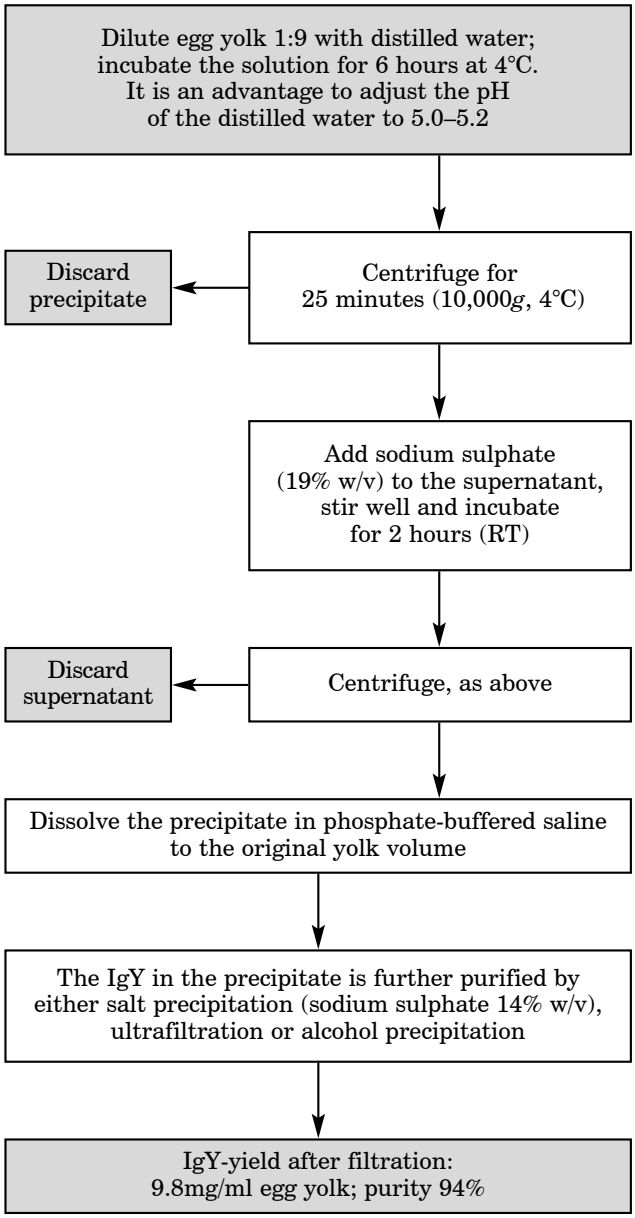
Figure 5: IgY-extraction by polyethylene glycol (PEG) precipitation



The diagram shows the procedure for IgY-extraction by protein precipitation with PEG, according to Polson et al. *(110).*

The first step removes most of the lipids (3.5% PEG). The second step (12% PEG) precipitates the IgY. This is a simple and efficient method.

Figure 6: IgY extraction by combined dilution and sodium sulphate precipitation



The principle of this method is the dilution of yolk with distilled water, followed by protein precipitation with sodium sulphate (101, 102).

fulfils this requirement, since chicken Abs can be easily sampled by a non-invasive method based on the simple action of egg collection, instead of the stressful bleeding of animals to obtain serum. It is fully in accordance with the Three Rs, *reduction*, *refinement* and *replacement,* principles of Russell & Burch (2).

IgY technology also offers outstanding advantages from an economical point of view. The costs for hen keeping are usually lower than those for keeping rabbits.

Furthermore, the Ab production of a hen roughly corresponds to that of a large mammal, such as a sheep or a goat. Thus, an extraordinary amount of Ab can be produced from only one hen — approximately 17–35g of total IgY/chicken/year, of which 1–10% can be expected to be antigen-specific (Table 3). This huge quantity of available Abs opens the door for new fields of application for IgY technology, such as in immunotherapy and in immunoprophylaxis for several viral and bacterial infections in veterinary and human medicine. The advantages of the use of chicken Abs have been recognised by many authors (for example, 3, 15, 33, 44, 72, 129–133).

Lack of cross-reactivity with rheumatoid factors

C-reactive protein (CRP) belongs to the so-called "group of acute phase proteins", which can be increased more than one hundred-fold as a response to inflammatory processes. An ELISA is carried out to monitor the serum concentration of CRP in, for example, rheumatoid patients. However, the results may be inaccurate due to the presence of rheumatoid factors (RFs), which are also immunoglobulins which are able to bind to immunoglobulins of other mammalian species. A substantial advantage of using IgY in serum-based ELISAs is its inability to cross-react with RFs, because of the absence of corresponding Fc located binding sites (131, 134, 135).

Lack of cross-reactivity with human anti-mouse antibodies

So-called human anti-mouse Abs (HAMAs) can be induced in patients receiving therapeutic mouse mAbs. Consequently, there is interference by HAMAs in immunological assays based on mouse mAbs (131). The development of other human Abs against other mammalian species, such as cow, horse and sheep, has also been reported (136). This results in a significant level of analytical interference in clinical diagnosis, and much effort has been made to overcome it. For example, only Fab fragments are used in some assays, in order to avoid binding to the site located on the Fc fragments. Another approach is the clinical use of "humanised" Abs, which means the replacement of the original Fc fragment by a corresponding human Fc fragment (136). Specific chicken Abs could be used as an alternative in the assays. However, according to Kricka (136), the clinical (human) use of IgY Abs is made doubtful by the lack of monoclonal IgY Abs. However, the actual clinical use of polyclonal IgY Ab to prevent *Pseudomonas aeruginosa* infections

in patients with cystic fibrosis (137) is an example which is in contrast to this opinion.

Lack of activation of the complement system

IgY is able to activate the avian complement system, but, in contrast, is unable to initiate the complement cascade in mammals (138, 139). According to Carlander *et al.* (138), the scale of interference by the Ab-induced complement activation with ELISA kits has been underestimated. Such interference is a significant problem, particularly when fresh, undiluted serum is used. The replacement of mammalian Abs by chicken Abs may help to avoid such interference. In addition, the dilution and storage of serum samples causes a progressive inactivation of the complement system.

A new field for the application of IgY is in experimental xenotransplantation. Xenoreactive natural Abs are the reason for the hyperacute rejection (HAR) of a xenotransplant (for example, in a pig-to-human system). The cell epitope, α-1,3-galactose (αGal), which is found in most mammals, but not in higher primates or in any bird species, is responsible for this phenomenon. Thus, it is possible to produce anti-αGal Abs in chicken (140). Since the IgY Abs lack binding sites for human complement factors and are also unable to bind the Fc-receptors of mammalian Abs, neither complement-mediated nor Ab-dependent cell-mediated cell lysis can take place in their presence. In an *in vitro* model, namely, porcine aortic endothelial cell culture, Fryer *et al.* (140) showed that the use of chicken anti-αGal Ab completely prevented both these types of lytic process. The morphology and biological activity of the porcine endothelial cells were not affected by the binding of chicken Ab (140, see also 141–143). Despite the interesting results obtained from the *in vitro* studies, if IgY against the anti-αGal-epitope is to be used *in vivo*, the kinetics of the host's Abs, as well as its interactions with the anti-αGal Abs, would have to be evaluated. To study such responses *in vivo*, Walsh *et al.* (143) injected mice with IgY (200µl of 1mg/ml every 24 hours, four injections i.v.) and found a strong increase in anti-IgY Abs after the animals had received the third dose. Thus, there are discussions as to whether the anti-αGal-epitope IgY could be used successfully in xenotransplantation studies during a short period of 3 or 4 consecutive days.

Lack of hetero-agglutinins (Coombs serum, blood group classification)

Coombs serum is an antiserum against human immunoglobulin, and is used for the detection of incomplete human Abs. It is usually produced in mammals, and may contain hetero-agglutinins, which may interfere with the corresponding detection system. This interference is usually avoided by adsorption of the disturbing Abs. A Cuban group (69) have shown that the use of IgY Abs is an alternative, since IgY preparations with specificity against human IgG Abs contain no hetero-agglutinins. The authors investigated 58 human serum samples with direct and indirect Coombs tests, and compared their own chicken Coombs reagent with a commercial one of mammalian origin. The results were identical. The same authors have also successfully used IgY Abs for human blood group classification (58).

Phylogenetic distance

Phylogenetic distance is the reason for the frequently described differences between the Ab specificities of mammals and chickens, even when identically immunised. In addition to differences between the mammalian and the avian immune system themselves, differences in phylogenetic development in these two animal classes contribute to the different Ab specificities. Several authors have reported that chickens often produce Abs against phylogenetical highly conserved mammalian proteins or peptides more efficiently than do rabbits (144, Figure 7). As a consequence, a conserved antigen can remain "masked" to the rabbit immune system, and thus cause only a weak or a "silent" response. Furthermore, if chickens and rabbits are immunised with the same mammalian antigen, very often the chickens respond with an Ab-specificity that can rarely be achieved in rabbits, as for instance, in the case of PIIINP (98), parathyroid hormone-related protein (145), transforming growth factor β3 (TGF-β3; 99), and YKL-40 glycoprotein, also known as cartilage gp-39 (146). Another indication of the phylogenetic distance between birds and mammals is the observation that IgY Abs produced against human pregnancy-associated proteins are cross-reactive with murine pregnancy-associated proteins (147, 148). Thus, such Abs can also be used for the detection of murine pregnancy-associated proteins.

Applications of IgY in Biomedical Research and in Human and Veterinary Medicine

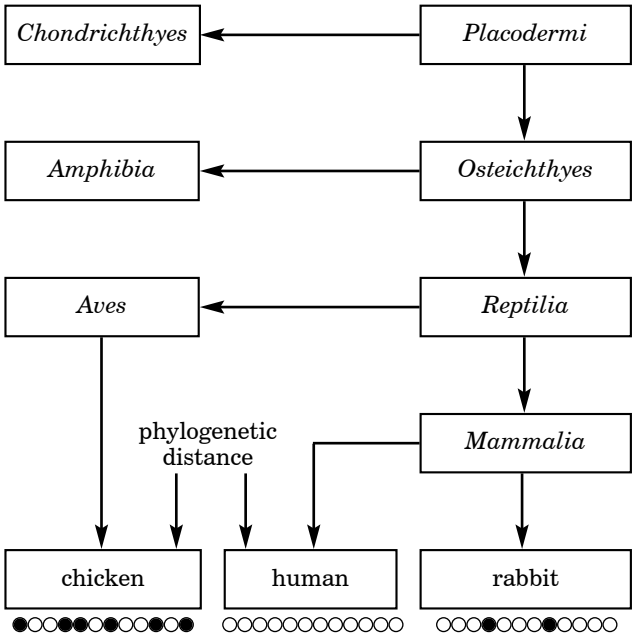
General applications

Several publications have described the successful use of IgY Abs in a variety of research fields (149–162; for a review, see 163). IgY-based immunoassays are being used to measure the concentration of proteins or peptides via ELISAs, RIAs

or other assays in clinical chemistry and basic research. However, there have recently been debates between IgY users as to whether IgY-based immunoprecipitates in some cases are rather diffuse and not as distinct as are IgG-based ones. This problem can be solved by using buffers with a high salt concentration (1.5 M NaCl with 5% PEG 6000; 150).

IgY Abs are used successfully in immunohistochemistry for the detection of antigens of viral, bacterial, plant and animal origin, and also to assess the incidence of intestinal parasites in domestic animals (78, 164) and the contamination of foods with toxins or drugs (75, 90). During the past decade, IgY Abs have increasingly been used in therapy or prophylaxis of disease and also in the new context of so-called "functional food". Recent studies have compared the properties of specific IgY and IgG Abs originating from identically immunised animals. The results mostly confirm that IgY Abs can be used in the same way as IgG Abs, but additionally offer advantages in terms of specificity, cross-reactivity and/or sensitivity.

Figure 7: Phylogenetic tree of vertebrates and phylogenetic distance



The diagram explains the meaning of the term "phylogenetic distance". The dot chains represent a hypothetical protein. The black dots within the dot chains represent amino acid exchanges. Due to the phylogenetic distance between aves and mammalia, the amino acid exchanges are more frequent in the chicken than in the rabbit (compared to the human protein). Consequently, the immune system of the chicken, rather than of the rabbit, recognises the human protein as a foreign protein. As a specific example, compared with the bovine prion protein (amino acids 151–190), there are only two amino acid exchanges in sheep and one in mouse, but 20 in chicken prion protein (212).

IgY for therapeutical or prophylactic use in veterinary medicine

Powdered whole eggs or yolks have been used as an inexpensive alternative for the IgY treatment of enteric diseases in veterinary medicine. The most famous example of a successful therapeutic/prophylactic use of IgY is the treatment of calves and piglets with specific Abs against *Escherichia coli* (K88, K99, 987P), rotaviruses and coronavirus (165–177; for a review, see 178). Studies using both animal models and trials in field herds have been carried out. The groups of Erhard (179), Lösch (180–182), Yolken (183) and Kuroki (171, 172) have performed a great part of the studies on the practical use of IgY. These studies confirmed that the treatment of diarrhoea in calves and piglets with specific egg yolk Abs has achieved significant prophylactic and therapeutic benefits. Other researchers have confirmed these results (169). Kuroki *et al.* (171) protected mice from murine diarrhoea rotavirus by the administration of 2µl IgY solution per mouse containing a neutralisation titre of between 1:10,240 and 1:2560 per mouse. Pokorova *et al.* (184) used IgY to protect dogs against canine parvovirus, but believed that the protection resulted from interactions between IgY and viral surface components. Sunwoo *et al.* (185) were able to demonstrate *in vitro* a marked growth inhibiting effect of specific IgY on *E. coli* 0157:H7, and showed that the growth inhibition was actually caused by the binding of specific IgY to the bacterial surface antigens, which caused significant changes in the bacterial surface structure. Another effect of IgY binding to bacterial surface antigens is a marked impairment of bacterial attachment to the intestinal mucosa (174, 186). Thus, therapeutic IgY administration could reduce the clinical use of antibiotics, and so could lower the risk that bacteria will develop antibiotic resistance.

Another approach is the prophylactic treatment of animals against intestinal parasites. Due to serious problems caused by the contamination of meat with drugs or bovine spongiform encephalopathy (BSE), consumers are increasingly concerned that food should be produced under strictly controlled biological conditions. This also includes the production of high quality meat, as for instance, in deer farming or in the husbandry of other wild animals. In intensive farming, animals have very close contact with each other, and thus have a higher risk of contamination via their own faeces. Intensive rearing also increases the incidence of infections with intestinal parasites (for example, *Strongylides*), which causes great problems for farmers. In order to avoid prophylactic antibiotic treatment, it should

be possible to produce IgY Abs against *Strongylides* antigens and to use them in diagnostic assays (for example, ELISAs) and for anti-parasitic treatments.

IgY has also been used to treat some typical fish farming diseases (for example, in salmon and trout), particularly in Scandinavia and Japan. Some researchers from Japan (187) have extensive experience in this field. For example, they have successfully treated *Edwardsiella tarda*-infected Japanese eels with specific anti-*E. tarda* IgY, and were able to show protective effects when the IgY extracts were administered directly into the aquarium water.

Recently, investigations have begun on the use of IgY technology to control American foulbrood disease (188), a disease of the larval and pupal stages of the honeybee (*Apis mellifera*), which is caused by the sporulated bacterium, *Paenibacillus larvae*. The disease causes great losses in Argentina, with an incidence of up to 30%. The greatest difficulty in prevention and control is with the *P. larvae* spores, which are resistant to most of the disinfectants and antibiotics which are used at present. In addition, the indiscriminate use of antibiotics is a serious obstacle for the production and export of honey, because their residues can generate bacterial resistance, which affects the human population.

Thus, the use of IgY Abs with specificity against bacterial antigens could be an important alternative, or at least an additional treatment, in other strategies, such as the genetic selection of bees with strict hygiene precautions (for example, removing infected larvae from the beehive) or the use of bacteriocins from fungus and lactic bacteria.

Another application of IgY technology is in the development of an IgY-based ELISA to quantify a 29kDa pregnancy-associated protein designated early pregnancy factor (EPF; 189, 190). This factor occurs in sows as early as 72 hours after insemination. From an economical point of view, it is important to know as soon as possible whether or not fertilisation was successful, so an EPF-ELISA would be a good tool for the early distinction between pregnant and non-pregnant sows.

IgY for therapeutic or prophylactic use in human medicine

The adherence ability of many viral and bacterial pathogens is a major prerequisite for the successful colonisation of a higher organism, especially with respect to the host's respiratory and intestinal mucosae, and it has been shown that specific IgY Abs against *Salmonella* antigens are able to inhibit the adhesion of this bacterium to epithelial cells *in vitro* (186).

Carlander *et al.* (191), Casswall (192) and Sarker *et al.* (193) investigated the action of hyperimmune bovine colostrum (HBC) against human rotavirus isolated from infected children. The oral administration of IGY Abs resulted in a significant protective effect (193). An anti-human rotavirus (strains Wa, RV5, RV3, ST3) IgY Ab was also effective, although to a lower extent than with HBC. According to another opinion, the use of IgY preparations with higher Ab titres, or increasing the amount of Abs administered, may improve the results (183).

Therapeutic protection through IgY anti-*Helicobacter pylori* Abs has also been investigated, though the results were not convincing, probably due to unfavourable basic conditions (192, see also 194). According to the latest evidence, the production of anti-*H. pylori* Abs by using a whole-bacterial-cell lysate for immunisation caused cross-reactivity with other bacteria, including the normal human bacterial flora, and this could have decreased the efficiency of IgY as a prophylactic reagent (195). Shin *et al.* (195) were able to identify the immunodominant proteins of *H. pylori*. Antibodies with specificity against these proteins are more effective as a prophylactic reagent.

Carlander *et al.* (196, 197) studied the benefits of IgY as a prophylactic tool against infectious diseases in patients with cystic fibrosis (CF), the most common fatal genetic disease of the Caucasian population in Europe and the USA. CF is caused by a mutation of the gene for a chloride channel protein, which results in the secretion of an abnormally thick mucus. This leads to secondary infections in the respiratory tract, caused by several bacterial species, one of which, *Pseudomonas aeruginosa*, infects virtually all CF patients. The researchers treated CF patients orally with an aqueous IgY anti-*P. aeruginosa* solution (70ml, 0.7mg/ml IgY), given as a mouth rinse in the evening. A high level of the specific chicken Abs could be demonstrated in the saliva via an ELISA, for approximately 8 hours after the treatment. Later, the IgY concentration gradually declined, and was completely undetectable in the saliva 16 hours after the treatment. Moreover, it was shown that a 2-minute mouth rinse gave a higher ELISA activity than a 1-minute rinse. These oral IgY treatments were successful in reducing chronic *P. aeruginosa* infections in CF patients, and thus resulted in a decrease in antibiotic prescriptions.

An effective local protection against plaque formation related to dental caries was achieved with anti-*Streptococcus mutans* IgY (198–202). This passive protection was clearly shown with both SPF rats and human volunteers, following the use of either purified IgY or whole-egg powder. Active immunisation against *S. mutans* glucan-binding protein B (GBP-B,) under experimental conditions, induces good protection against experimental dental caries. This protection results from the continuous secretion of salivary Abs against GBP-B, which prevents the accumulation of *S. mutans* on the den-

tal biofilm. The passive protection achieved by IgY is based on the same principle. In fact, the administration of IgY anti-*S. mutans* GBP-B via the diet and drinking water of rats which had been infected, caused a significant decrease in *S. mutans* aggregation on dental biofilms. In all these trials, a direct correlation was found between a given IgY dose and a reduction in the incidence of dental caries (201, 202). Furthermore, the decrease in the *S. mutans* infection rate did not require continuous IgY administration (201). Hatta *et al.* (200) evaluated the efficacy of oral IgY anti-*S. mutans* rinses in human volunteers. This IgY inhibited *S. mutans* adherence to saliva-coated hydroxyapatite discs by 59%, while the control IgY from non-immunised hens only gave an 8% inhibition. All these results strongly support the efficacy of oral treatments with anti-*S. mutans* IgY as a new alternative for reducing dental plaque in humans. Recently, similar studies on caries prevention have also started in Argentina (conducted by S. Pérez Lozano *et al.*, Universidad Nacional de Buenos Aires).

Another possible field for the oral application of specific IgY could be with *Cryptosporidium parvum*s infections. Okhuysen *et al.* (203) observed a significant protective effect in volunteers orally treated with anti-*Cryptosporidium* HBC. The oral administration of corresponding IgY Abs could produce similar effects, and this has already been demonstrated in a mouse model (204, 205) .

LeClaire *et al.* (206) produced IgY Abs against the highly toxic staphylococcal enterotoxin B (SEB), to test their possible therapeutic use. SEB is considered to be a potential biological warfare agent, so there is an increasing necessity to develop vaccines and therapeutic approaches for intoxication with SEB. The authors demonstrated that the prophylactic and therapeutic application of anti-SEB IgY completely protected mice and rhesus monkeys against a lethal SEB aerosol challenge.

Worledge e*t al.* (207) demonstrated significant protective effects after the oral application of specific IgY against tumour necrosis factor (TNF) in an experimental model of colitis in the rat. TNF is implicated in the pathogenesis of inflammatory bowel disease. The oral use of such Abs is considered to have fewer systemic side-effects than the intravenous infusion of a humanised murine anti-TNF mAb (Infliximab, Centocor, Malvern, Pennsylvania, USA).

The protective effects of anti-venom IgY against rattlesnake and scorpion toxins has been shown in a mouse model (208). Almeida *et al.* (209) achieved similar results, producing IgY against venom from Brazilian snakes of the *Bothrops* and *Crotalus* genera. Similar investigations are being performed in Bangalore (Vittal Mallya Research Institute of Bangalore, India [http://www.spiegel.de/spiegel/0,1518,231565,00.html]). The use of anti-venom IgY is advantageous, since, because of the characteristics of IgY Abs discussed above, fewer immunological side-effects can be expected (210, 211). The research group of C. Gomez *et al.* (Universidad Nacional de La Plata, La Plata, Argentina, unpublished results) have successfully produced specific IgY Abs against botulinum toxin type A, which have been used for immunoneutralisation in a mouse model.

Conclusions and Future Prospects

Today, there is no doubt that chicken Abs can be produced and used, with minor modifications, in similar ways to the use of mammalian Abs. It can also be said that, depending on the circumstances, the use of IgY Abs often has significant advantages over the use of mammalian Abs. However, from a realistic point of view, it must be concluded that IgY Abs will not be able to completely replace the use of IgG Abs in diagnostic systems in the near future. Chickens have the potential to be used to complete the spectrum of animals used for Ab production. However, a prerequisite is to make IgY technology more popular and to convince the scientific community of its significant advantages. The production of chicken mAbs would combine the advantages of monoclonal Abs with the advantages of chicken Abs. It is to be expected that studies on the therapeutic or prophylactic use of IgY Abs will be intensified in future. In particular, because of the increasing resistance of microorganisms to antibiotics, research on all aspects related to the development of specific IgY against pathogenic microorganisms will have to be intensified. IgYs can be used both in veterinary medicine and in human medicine. In South America, for instance, there is a great interest in developing egg powders as additives for milk substitutes. Such formulations are needed to protect children from fatal intestinal infections, particularly in financially weak countries. IgY technology is a fast developing field and we have tried to cover most of its aspects in this rewiew. We are convinced that, once accepted and widely used, the technology will offer alternatives and solutions to science, to medicine and to society as a whole.

Acknowledgements

We are grateful for the support of SETCIP, Argentina (Grant AL/PA/00-BVIII/006ARG/00/004), of CITMA, Cuba (Grant CUB 00/006), and of DLR/BMBF, Germany (Grants ARG 00/004 and CUB 00/006). The authors also thank Alexandre Patchev for his review of the use of English.

Received 2.7.03; received in final form 8.3.04; accepted for publication 19.3.04.

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Rev. sci. tech. Off. int. Epiz., 2009, 28 (1), 113-136

Pathogenesis and pathobiology of avian influenza virus infection in birds

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Summary

Avian influenza (AI) viruses vary in their ability to produce infection, disease and death in different bird species. Based on the pathobiological effect in chickens, AI viruses (AIV) are categorised as low pathogenic (LPAIV) or highly pathogenic (HPAIV). Typically, LPAIV cause asymptomatic infections in wild aquatic birds, but when introduced into domesticated poultry, infections may be asymptomatic or produce clinical signs and lesions reflecting pathophysiological damage to the respiratory, digestive and reproductive systems. The HPAIV have primarily been seen in gallinaceous poultry, producing high morbidity and mortality, and systemic disease with necrosis and inflammation in multiple visceral organs, nervous and cardiovascular systems, and the integument. Although HPAIV have rarely infected domestic waterfowl or wild birds, the Eurasian-African H5N1 HPAIV have evolved over the past decade with the unique capacity to infect and cause disease in domestic ducks and wild birds, producing a range of syndromes including asymptomatic respiratory and digestive tract infections; systemic disease limited to two or three critical organs, usually the brain, heart and pancreas; and severe disseminated infection and death as seen in gallinaceous poultry. Although experimental studies using intranasal inoculation have produced infection in a variety of wild bird species, the inefficiency of contact transmission in some of them, for example, passerines and Columbiformes, suggests they are unlikely to be a reservoir for the viruses, while others such as some wild Anseriformes, can be severely affected and could serve as a dissemination host over intermediate distances.

Keywords

Avian diseases – Avian influenza virus – Highly pathogenic avian influenza – Low pathogenic avian influenza – Pathobiology – Pathogenesis – Pathotypes.

Introduction

Avian influenza (AI) viruses infect a wide variety of domestic poultry, captive birds, and free-ranging wild bird species under natural and experimental conditions. Wild aquatic birds are the main reservoirs of AI viruses (AIV). These viruses are highly host-adapted, replicating in epithelial cells of the gastrointestinal and respiratory tracts, producing asymptomatic infections. Periodically, these AI viruses have been transmitted from wild aquatic to domestic birds producing subclinical infections, or, occasionally, respiratory disease and drops in egg production. This type of virus is typically termed low pathogenic avian influenza virus (LPAIV) and can carry any combination of the 16 haemagglutinin (HA) and 9 neuraminidase (NA) subtypes. However, after circulating in domestic poultry a few H5 and H7 LPAI viruses have mutated into highly pathogenic avian influenza viruses (HPAIV). These HPAIV cause severe systemic disease with lesions of necrosis and inflammation in the skin, viscera and brain of gallinaceous poultry (Order: Galliformes). Historically, HPAIV have not infected wild birds except for the die-off among common terns (*Sterna hirundo*) in South Africa in 1961 (7). However, since 2002, the Eurasian-African H5N1 HPAI viruses have caused infections, illness and death in a variety of captive, zoo and wild birds.

This review will cover the general pathobiological features of LPAIV and HPAIV infections in domestic poultry and wild birds, drawing information from multiple sources but

principally from specific summary (88, 92, 94) and original research papers (1, 3, 4, 6, 7, 13, 15, 20, 22, 23, 35, 36, 42, 43, 46, 47, 56, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 76, 77, 78, 85, 87, 89, 90, 91, 93, 95, 96, 97, 99, 115).

Pathogenicity of avian influenza viruses

Pathotypes

The pathogenicity of a virus refers to its ability to produce disease. Avian influenza virus infection of domestic poultry produces syndromes ranging from asymptomatic infection to respiratory disease and a drop in egg production, to severe, systemic disease with near 100% mortality. Influenza A viruses that infect poultry are classified into two pathotypes, LPAIV and HPAIV. The HPAIV produce 75% or greater mortality in intravenously inoculated chickens (*Gallus domesticus*), have a chicken intravenous pathogenicity index of 1.2 or greater, or are AIV (H5 or H7) having an HA cleavage site with a polybasic amino acid sequence similar to that of other HPAIV (112). All AIV that do not meet a highly pathogenic criterion are classified as low pathogenic. The use of the term HPAI for chickens does not indicate or imply that the AI virus strain is highly lethal for other bird species, but similar high lethality has been typically seen after infection of other gallinaceous poultry (e.g. turkey [*Meleagris gallopavo*], Japanese quail [*Coturnix japonica*], bobwhite quail [*Colinus virginianus*], pearl guineafowl [*Numida meleagris*], ring-necked pheasant [*Phasianus colchicus*] and chukar partridge [*Alectoris chukar*]).

Pathobiological concepts applied to avian influenza virus infections

Although only two pathotypes of AIV are defined in the laboratory, natural infection by AI viruses results in a wide range of clinical outcomes, which are dependent on virus strain, host species, and environmental factors (92). In order to comprehend the complex biology of AI viruses in avian species, several pathobiological concepts need to be understood.

Viral pathogenesis

Viral pathogenesis is the pathophysiological process that occurs when a virus infects a host.

Infectivity

Infectivity is the ability of the virus to bind to and enter cells of the host, replicate and produce and release infectious virus progeny.

Disease

Disease, the harmful pathobiological consequence of infection, includes abnormal physiological and anatomic changes as a result of virus replication within the cell, tissue and/or organ. In general, as virus replication increases, the severity of pathobiological changes also increases, and gross and microscopic lesions develop. Most HPAIV strains causing major cell damage and cell death, if sufficiently severe, can cause critical organ failure and death of the host.

There are four potential clinical outcomes following AI virus exposure: no infection, asymptomatic (subclinical) infection, mild disease, and severe disease leading to death. In each case, other than the first, exposure, or access to the virus, is critical to start the process. With some AI virus strains and some hosts, exposure to virus may not result in infection, especially if the route of exposure is inappropriate, the viral dose is below the threshold to initiate infection, immunity is present against the virus strain, or the virus strain is not adapted to the specific host species. The mean intranasal infectious dose for selected AI virus isolates (determined in domestic poultry under experimental conditions) has been shown to be both host- and virus-strain dependent, and measuring this infectious dose could be a means of assessing the infectivity and adaptability of the virus to a specific host (Table I) (98).

Host adaptation

Host adaptation, which is the result of progressive genetic changes in a virus, increases the efficiency of binding, replication and release of the virus from a specific host species. Viruses with low adaptation fail to replicate efficiently in the host species unless there is high dose exposure or accompanying secondary factors that increase host susceptibility. By comparison, an AI virus strain expressing a high degree of adaptation to a specific host species may require a low dose exposure to produce infection. Host adaptation can be maximal for only a single host species, although, in evolutionarily closely related species, the virus strain may show a gradual decrease in its level of adaptation and thus infectivity.

Transmissibility

Transmissibility is the natural host-to-host spread and implies a specific host-adapted virus, exposure to the virus through contact with infected animals or fomites, and a naïve, susceptible host. Three factors affect transmission efficiency:

– virus shedding by the host into the environment, in terms of viral titre, duration and source (oral, cloacal)

– environmental stability of the virus, which is impacted by temperature, humidity and organic matter content

– the minimal infective dose of virus (81).

Table I
Variability in intranasal infectivity of several low pathogenic avian influenza viruses (LPAIV) and highly pathogenic avian influenza viruses (HPAIV) for different poultry species, as determined by mean bird infectious dose (BID_{50})
Modified from Swayne and Slemons (98)

Virus strains	Subtype	Host species	BID_{50}	References
HPAIV				
A/chicken/Rostock(Germany)/1934	H7N1	Chicken	1.2	(98)
A/tern/South Africa/1961	H5N3	"	3.4	"
A/chicken/Victoria/1975	H7N7	"	2.9	"
A/turkey/Ireland/1378/1983	H5N8	"	4.7	"
A/chicken/Pennsylvania/1370/1983	H5N2	"	3.0	(93)
A/Hong Kong/491/1997	H5N1	"	2.3	(86)
A/chicken/Italy/4580/1999	H7N1	"	2.0	(98)
A/chicken/Yamaguchi/7/04	H5N1	"	2.5	(104)
LPAIV				
A/emu/Texas/39924/1993	H5N2	Chicken	4.2	(90)
A/cinnamon teal/Bolivia/4537/01	H7N3	"	6.2	(79)
A/turkey/Virginia/15821/2002	H7N2	"	2.8	(105)
A/duck/Pennsylvania/454069-9/06	H5N1	"	7.5	(80)
A/chicken/Alabama/1975	H4N8	"	5.8	(98)
		Turkey	6.0	"
		Domestic duck	3.3	"
		Domestic goose	4.0	"
		Japanese quail	2.6	"
A/mallard/Ohio/338/1986	H4N8	Chicken	8.3	"
		Turkey	4.0	"
		Domestic duck	3.1	"
		Domestic goose	1.7	"
		Japanese quail	1.5	"
A/mallard/Ohio/184/1986	H5N1	Chicken	7.7	"
		Turkey	4.2	"
		Domestic duck	1.9	"
		Domestic goose	5.6	"
		Japanese quail	5.4	"

Virulence and pathogenicity

Virulence and pathogenicity describe the relative capacity of a virus to cause disease and are determined by the capacity of a virus to grow, be invasive, infect susceptible cells, evade the immune system and cause cellular damage (108). These capacities are encoded in the viral genome by individual virulence genes. The specific property associated with virulence is termed virulence determinant. Pathogenicity of AI viruses is a polygenic trait and depends largely on an 'optimal' gene constellation affecting host and tissue tropism, replication efficacy and immune evasion mechanisms, amongst others.

Tropism

Tropism is the capacity of a virus to infect or damage specific cells, tissues or organs, and is a fundamentally important contributor to viral pathogenesis and virulence (108). Tropism is determined by many viral and host factors, including how the virus spreads, the permissiveness of specific cell types for the virus (as defined by receptors, cellular differentiation, and intrinsic cellular resistance to infection), and the nature of innate and adaptive immune responses (108). Cell-intrinsic resistance to infection is conferred by the presence of molecules in the cells that block viral infection. Events that

are dictated by processes that occur outside of the cell are termed cell-extrinsic and many are related to the innate and adaptive immunity. An example is the death of infected cells that may result from cell-intrinsic induction of apoptosis, or cell-extrinsic immune factors such as cytokines.

Avian influenza viral pathogenesis

The HA is the major determinant of virulence, but maximum expression of virulence requires an optimal combination of internal genes (9). To initiate the infection process in birds, the HA must first bind to **a**.2,3-galactose linkage cell receptors to initiate receptor-mediated endocytosis. This is a poorly understood phenomenon but it impacts both host specificity and cell or tissue tropism (92). Changes in receptor-binding will change the host range of influenza viruses (57). In addition, fusion of the viral envelope with the endosomal membrane requires a cleaved HA. For LPAIV, trypsin-like proteases, which are restricted to epithelial cells, cleave the precursor HA0 into functional HA1 and HA2 proteins, resulting in infection and lesions in epithelial-cell-containing organs, primarily respiratory and digestive tracts. However, with HPAIV, ubiquitous furin proteases cleave HA0 to functional HA1 and HA2 proteins, resulting in infection and lesions in many cell types in numerous visceral organs, the nervous system and the cardiovascular system (82). Pathogenesis studies of AIV in chickens and ducks indicate that the NA, NS, PA, PB1, PB2, and NP proteins are also important determinants of virulence (17, 30, 31, 52, 73, 109).

Mechanisms of cellular pathobiology

The mechanism for damage by HPAIV in avian cells is primarily cell death through necrosis or apoptosis (28, 70). A high level of virus replication, usually evident as visualisation of abundant AIV nucleoprotein in the nuclei and cytoplasm of infected cells and high AIV titres in tissue samples, has been associated with necrosis (92). Neurons of the brain, kidney tubular cells, pancreatic acinar epithelium, cardiac myocytes, adrenal cortical cells, and pulmonary epithelial cells are the most frequently reported sites of necrosis in infected chickens (85). Cell death associated with apoptosis has been confirmed in various cell culture systems and has involved cytokine expression, typically including interferon-**&#65533;** and transforming growth factor-**&#65533;** (27, 75, 100).

For LPAIV, the nasal cavity is the predominant initial site of virus replication, with spread to other parts of the respiratory tract and the intestinal tract (92). However, secondary bacterial, fungal or viral infections are usually necessary to produce sufficiently severe respiratory damage to result in illness or death. Rarely, LPAIV have spread systemically, causing infection and damage in epithelial-containing tissues of visceral organs such as the kidney, pancreas, and oviduct (5).

With HPAIV, infection in chickens is initiated in the nasal epithelium within 16 h of direct intranasal exposure and, within 24 h, the nasal epithelium is necrotic, with accompanying submucosal inflammation and virus in capillary endothelial cells (92). Inflammatory cells, principally macrophages and heterophils, play important roles in the initial replication and dissemination of HPAIV, as does virus replication within endothelial cells and spread through the vascular or lymphatic systems. Such viraemia allows dissemination of HPAIV, and initiates replication in a variety of parenchymal cell types within the brain, skin and visceral organs. After intranasal exposure, replication of most HPAIV may be seen within 24 h in visceral organs. Within 48 h, the virus titres may be maximal and the lesions severe. However, some HPAIV require a longer period of time to produce illness and death. These HPAIV produce viraemia with lack of or minimal vascular endothelial cell replication but tend to extensively replicate in parenchymal cells of visceral organs. With some HPAIV, increased vascular permeability is responsible for oedema, haemorrhage and multiple organ failure with associated damaged vascular endothelial cells and accompanying microthrombosis. In some cases, the vascular damage can progress to consumptive coagulopathy with accompanying thrombocytopoenia, thrombi and emboli in vessels, and altered blood clotting times. If the HPAIV infected chicken survives the peracute phase (days one and two after exposure), the virus may disseminate and replicate in multiple critical organs, causing single or multi-organ failure and death with involvement of the brain and autonomic nervous system, myocardium, endocrine tissue (e.g. adrenal gland) and/or pancreas. Avian influenza viruses can cause damage by three different pathophysiological mechanisms:

– direct virus replication in cells, tissues, and organs

– indirect effects from production of cellular mediators such as cytokines

– ischaemia from vascular thrombosis (92).

Species variation

The ability of individual AI viruses to cause disease and the host response to these viruses vary greatly with individual bird species and virus strain. Four pre-1975 H7 HPAIV were highly lethal for chickens, but failed to induce disease, or produced only mild clinical signs, in domestic ducks (2). In addition, some differences have been observed in lethality and induced lesions between different gallinaceous bird species in experimental studies utilising

various LPAIV and HPAIV (49, 70, 111). The differences in type and severity of disease did not always result from the ability of the virus to infect or not infect a particular gallinaceous bird species, because some birds became infected but did not show disease.

Pathobiology of low pathogenic avian influenza

Gallinaceous species

Under both natural and experimental conditions, the majority of AIV are of low pathogenicity. Most LPAIV produce subclinical infections in experimental studies, but under natural conditions with accompanying secondary pathogens, mild to moderate disease syndromes are common. Typically, LPAIV have limited local replication in the respiratory and alimentary tracts. However, some LPAIV such as certain Asian H9N2 lineages, adapted to efficient replication in poultry, may cause more prominent signs and also significant mortality (5, 51).

Clinical signs

Low mortality (<5%) accompanied by high morbidity (>50%) is typical. However, mortality rates can increase after co-infection with a secondary pathogen or in juvenile birds. Specific signs will differ with the virus strain, species and age of the host, and typically include pathophysiological changes in the respiratory, digestive, urinary, and reproductive systems (92). Many LPAIV infections present clinically as mild-to-severe respiratory disease with signs of coughing, sneezing, rales, rattles, and excessive ocular discharge. Hens may express increased broodiness and transient decrease in egg production. In general, birds may have decreased activity, mild weight loss and may huddle into groups. Individual birds may be lethargic and have ruffled feathers and decreased feed and water consumption, leading to mild weight loss and, occasionally, diarrhoea.

Gross lesions

The expression of gross pathological changes is dependent upon the host species, virus strain, time to death, and the presence of secondary pathogens (92). Most frequently, rhinitis and sinusitis are observed, and if accompanied by secondary bacterial infections, swollen infraorbital sinuses and nasal discharge may be present, especially in turkeys. The tracheal mucosa may be reddened from congestion, with oedema and occasionally haemorrhages and luminal exudates. Occasionally, tracheal exudates form plugs that occlude airways resulting in peracute asphyxiation. When secondary bacterial pathogens are present, fibrinopurulent bronchopneumonia, air sacculitis and coelomitis ('peritonitis') may be present. In hens, the ovaries may regress and mature ova rupture producing free yolk in the coelomic cavity or 'egg yolk peritonitis'. The oviduct may be swollen with luminal exudates. The last few eggs produced may lack pigment and be thin-shelled and misshapen. Rarely, laying hens may have swollen kidneys with accompanying renal failure and visceral urate deposition ('visceral gout'). Mild enteritis may be present, particularly in turkeys. In rare cases, pancreases of turkeys have been pale, mottled and contained random haemorrhages.

Histological lesions and immunohistochemical features

Table II provides a summary of the histological lesions that have been seen in different studies. Most frequently, LPAIV produced heterophilic-to-lymphocytic rhinitis, sinusitis, tracheitis and bronchitis with common demonstration of AIV antigen in epithelial cells of the upper respiratory tract. Pneumonia has been reported and in the most severe cases was accompanied by diffuse air capillary oedema. On rare occasions, nephrosis and nephritis were present in hens and were augmented by the high calcium layer diet. In experimental studies and natural cases in turkeys during the 1999 Italian H7N1 LPAI outbreak, necrosis in the pancreas was reported (13). With other LPAIV infections, pancreatitis has been much less common in chickens than in turkeys. In birds that die from LPAIV infections, the cloacal bursa, thymus, spleen, and other areas with lymphocyte accumulations have shown depletion of lymphocytes, but without evidence of virus infection in lymphocytes.

Non-gallinaceous bird species

In wild aquatic birds, little is known of natural LPAIV infections other than their general asymptomatic nature. In experimental studies, LPAIV preferentially infected intestinal epithelial cells and were excreted in the faeces. In one study, infected mallard hens had a transient decrease in egg production (48). In domestic ducks and geese, LPAIV infections varied from asymptomatic infections to the production of respiratory disease evident as conjunctivitis, sinusitis, and lower respiratory tract lesions. Co-infections with bacteria have been common and usually associated with production of more severe clinical disease, especially with lesions of air sacculitis, pneumonia and sinusitis. In ratites, LPAIV primarily produced respiratory disease, but in some cases digestive tract disease was also seen, evident as green diarrhoea or 'green urine'. In emus (*Dromaius novaehollandiae*) and rheas (*Rhea americana*), the most frequent lesions included ocular and/or nasal discharge; sinusitis; tracheitis with haemorrhage, bronchitis and air sacculitis; interstitial pneumonia; and when accompanied by secondary bacterial infection, fibrinous perihepatitis and pericarditis.

Table II
Histological lesions associated with avian influenza in gallinaceous species
Modified from Swayne and Pantin-Jackwood (94)

Organ or tissue	Lesion	References	
		HPAI	LPAI
Nasal cavity	Epithelial cell necrosis, rhinitis, sinusitis	(34)	(13, 34, 56, 87)
Trachea	Tracheitis	(56, 76, 93)	(13, 56, 78, 87)
Lung	Oedema, congestion, haemorrhage, interstitial pneumonia, bronchitis	(13, 56, 76, 87, 93)	(34, 56, 78, 87)
Heart	Myocyte necrosis, myocarditis	(13, 16, 34, 43, 56, 67, 85, 87)	NL
Brain	Oedema of neuropil, neuronal necrosis, gliosis, perivascular cuffing, meningoencephalitis	(1, 42, 56, 67)	NL
Enteric tract	Haemorrhage, lymphoid depletion, epithelial necrosis, enteritis	(13, 34, 56, 67, 87)	NL
Pancreas	Vacuolation, acinar epithelial cell necrosis, pancreatitis	(1, 13, 34, 56, 67, 87)	(13)
Spleen	Lymphoid depletion, necrosis, splenitis, hyperplasia of macrophage-phagocytic cells	(16, 34, 56, 67, 85, 87)	NL
Bursa, thymus, caecal tonsils	Lymphoid depletion, phagocytic hyperplasia, necrosis, haemorrhage	(67, 87)	(92) [a]
Adrenal glands	Necrosis, adenitis	(34)	NL
Integument	Subcutaneous oedema, epidermal and feather follicle necrosis	(67)	NL
Bone marrow	Cellular depletion, necrosis	(56,67)	NL
Skeletal muscle	Myofibre degeneration and necrosis	(1, 34, 56,67, 87)	NL
Kidney	Tubule necrosis, interstitial nephritis	(56, 87)	(77, 78, 88) [a]
Liver	Hepatocellular necrosis	(67)	NL
Reproductive organs	Necrosis, salpingitis and oophoritis	(15)	NL

a) Experimentally in intravenous route of inoculation, rare in natural cases
NL: no lesion

Infection of a 3-month-old red-lored Amazon parrot (*Amazona autumnalis autumnalis*) with H5N2 LPAIV of the lineage causing infections in poultry since 1994 was associated with severe lethargy (26). With veterinary support care, the parrot recovered.

Pathobiology of highly pathogenic avian influenza

Gallinaceous species

Highly pathogenic avian influenza viruses produce high mortality rates in chickens and usually other gallinaceous birds, but the times to death are typically shorter in chickens and vary with individual HPAIV strains.

Clinical signs

Clinical signs vary with the duration of the infection, the organs or organ systems affected and the degree of tissue damage. With peracute disease, birds may be found dead without prior clinical signs or with only a few birds expressing lethargy, recumbency and a comatose state. On a flock basis, the birds may show decreased activity, produce less noise, and have decreased feed and water consumption before increased mortality is detected. In hens, egg production can drop precipitously, with cessation of egg production within six days. Faeces may be loose and contain mucus, bile or urates. Respiratory signs are less frequent than with LPAIV infections. Peracute disease is more frequent in chickens and turkeys than in other galliforme birds, but the clinical signs and the duration of morbidity may be similar.

If the clinical course is acute to subacute (3 to 10 days), birds may develop nervous signs including tremors of head and neck, torticollis, opisthotonus, nystagmus, unusual positions of head and appendages, flapping movements of the wings, paresis, paralysis, excitation, convulsions, rolling or circling movements, incoordination, loss of balance, and recumbency with pedaling movements. The occurrence of neurological signs will vary depending on the species of bird and the HPAIV strain. However, neurological signs are not pathognomonic for HPAI and can also result from velogenic Newcastle disease, other infectious diseases, or non-infectious causes.

Gross lesions

The frequency of gross lesions varies with species of bird and virus strain, and all lesions are not present consistently

in all birds. Generally, HPAIV infections affect multiple visceral organs, the cardiovascular and nervous systems and the integument, producing necrosis, oedema and haemorrhage (Fig. 1). In peracute disease, no gross lesions may be seen. In acute disease, birds may have ruffled feathers, and swelling (oedema) of the comb, wattles, periorbital and intermandibular areas, upper neck, leg shanks and feet with accompanying subcutaneous haemorrhages, especially of the non-feathered skin (Figs 1a-1d). Some virus strains produce oedema and hyperaemia of the conjunctiva, eyelids, and trachea. The wattles, combs and snoods may contain necrotic foci and petechial-to-ecchymotic haemorrhages, or may be cyanotic. Ischaemic necrosis from vascular infarction is responsible for the cyanosis.

Internally, haemorrhages may be present on serosal or mucosal surfaces, and be accompanied by necrotic foci within multiple visceral organs (Figs 1e-1j). Haemorrhages may be especially common in the coronary fat and on the epicardium (Fig. 1f), in the serosal fat pad and in the mucosa of the proventriculus (Fig. 1g) and ventriculus, and in the pectoral muscles (Fig. 1h). Less frequently, haemorrhages will be present in the caecal tonsils (Fig. 1j) and Meckel's diverticulum, and on the inner surface of the sternum. Necrosis and haemorrhage in the pancreas may be seen as red to light orange to brown mottling (Fig. 1m). Hens may have ruptured ova with free yolk in the coelomic cavity. Unique to the recent Eurasian-African H5N1 HPAIV lineage and classic fowl plague viruses is the production of necrosis and haemorrhage in Peyer's patches of the small intestine (Fig. 1i), severe oedema and haemorrhage in the lungs (Fig. 1e), and occasionally, oedema of the brain. With many HPAIV, white foci of necrosis may be present in the heart, and occasionally, the liver and kidneys. Urate deposits may accompany the necrosis in kidney. Occasionally, the lungs may be firm from oedema and interstitial pneumonia and have congestion and haemorrhages. In young birds, the primary lymphoid organs (cloacal bursa and thymus) may be atrophic, with or without haemorrhage. The spleen may be enlarged with pale necrotic foci or be normal in size.

Microscopic lesions

Microscopic lesions are more frequent than gross lesions in most HPAI cases. Histopathological lesions in birds from experimental studies vary with virus strain and passage history; inoculum dose and route of inoculation; and species, strain and breed of bird host. Most frequently, histological changes consist of necrosis and/or inflammation in multiple organs, most often and most severely within the skin (including feather follicles), brain, heart, pancreas, lungs, adrenal glands, and primary and secondary lymphoid organs (Table II and Fig. 2). In peracute disease, microscopic lesions are lacking in most organs, but occasionally, mild or multifocal necrotic and inflammatory lesions are seen, with virus present principally in vascular endothelial cells and cardiac myocytes (Fig. 2). In acute disease, visceral organs may have multiple foci of necrosis, and associated inflammation, haemorrhage, and oedema. However, necrosis is less prominent and inflammation more prominent in birds that survive longest. Avian influenza virus antigen is associated with areas of necrosis and inflammation, but is not present in apoptotic lymphocytes. Common lesions are described in Table II. Lesions are similar in other gallinaceous species, but since these species survive longer than chickens or turkeys, inflammation is more common and prominent than necrosis in parenchymal organs.

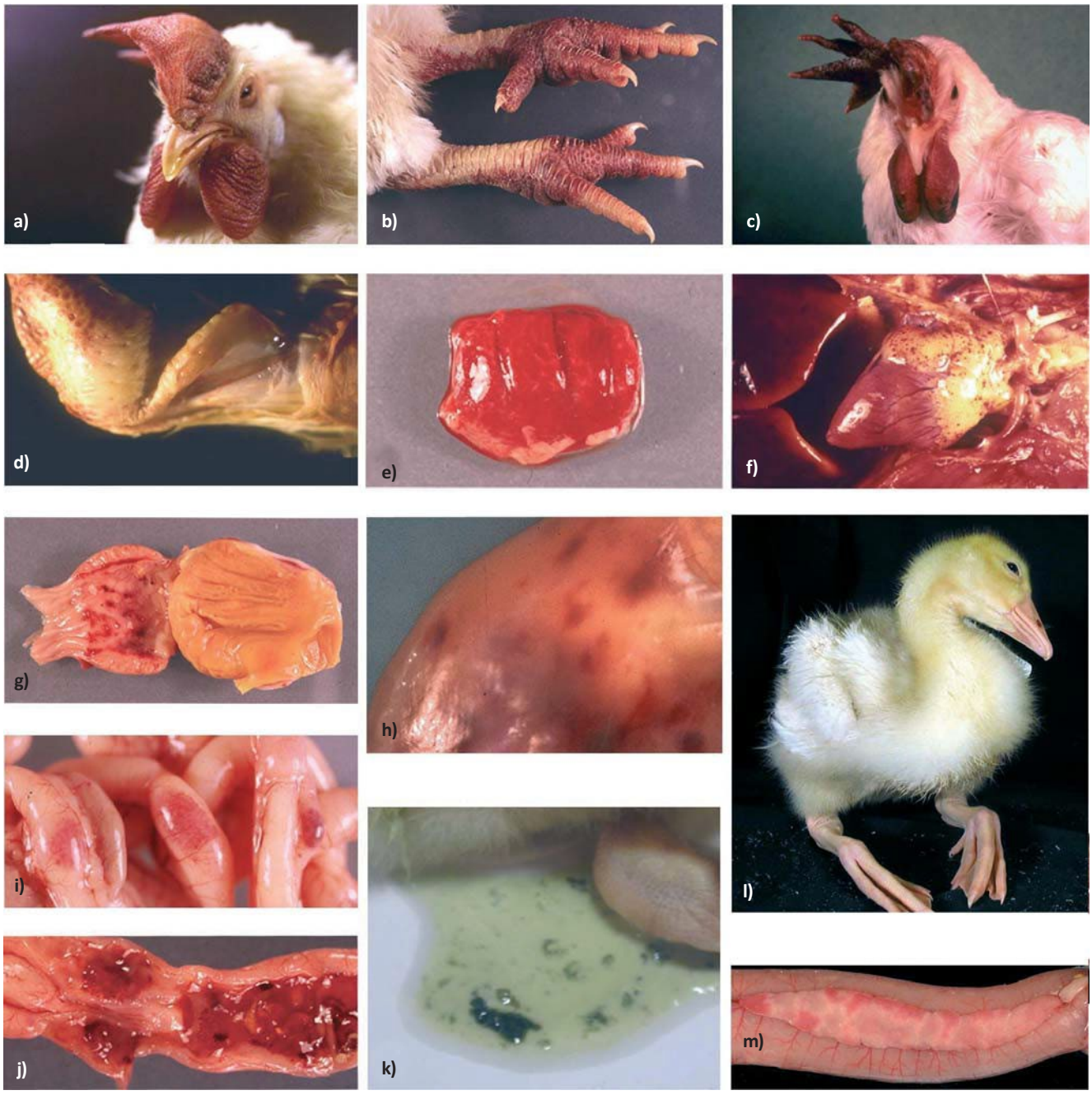
Tissue and cellular sites of viral replication and damage

Highly pathogenic avian influenza viruses grow to high titres in, and are shed from, the respiratory and intestinal tracts and spread systemically, with viral antigen demonstrated in both vascular endothelial cells and parenchymal cells of multiple organs (Fig. 2). The dominant lesion in acute disease is necrosis, which can result from vascular damage such as thrombosis and embolism, leading to infarction, especially in the skin. However, necrosis and subsequent inflammation can also result from direct viral replication and damage to the parenchymal cells, most commonly in visceral organs, nervous system and skin (28). In addition, vascular damage causes oedema, congestion and haemorrhage, visible as reddening and swelling in the heads, legs and feet (58). Pathophysiologically, viraemia and vascular damage precede the parenchymal lesions. The extent of virus spread and resulting diversity of lesions is dependent upon host survival time, which is partially related to host resistance (variable according to age, species, strain, etc.) and virus virulence (29). Highly pathogenic avian influenza virus strains may be epitheliotropic, endotheliotropic, neurotropic or pantropic depending upon the avian host. For example, A/turkey/Ontario/7732/1966 (H5N9) HPAIV was neurotropic without extensive vascular endothelium replication in turkeys (58). At a minimum, HPAIV are neuropathogenic by three different mechanisms:

– direct viral spread from the epithelium in the posterior nasal chamber through olfactory nerves to olfactory bulbs and anterior brain

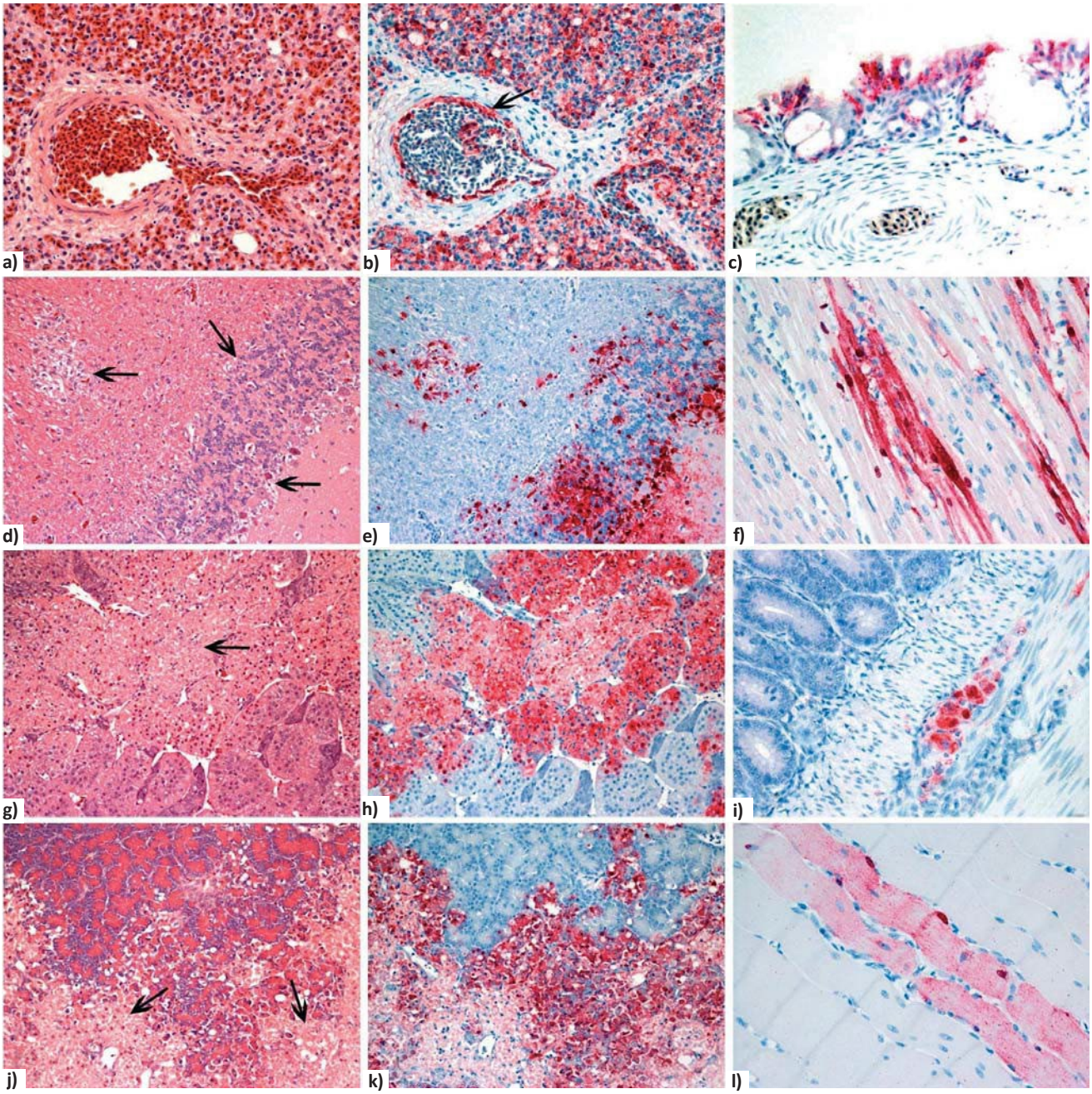
– dissemination through the cardiovascular system resulting in random multifocal necrosis and microgliosis in brain parenchyma

– infection of ependymal cells resulting in associated ventriculitis and periventricular necrosis and inflammation (42).



a) Oedema of comb, wattles, and periorbital tissues, A/chicken/Puebla/1994 H5N2 HPAI virus (94)
b) Severe subcutaneous haemorrhage and oedema of feet and leg shanks, A/Hong Kong/156/97 (H5N1) (85)
c) Severe oedema, necrosis and haemorrhage of comb and wattles, highly pathogenic embryo derivative, A/chicken/NJ/12508/86 (H5N2) (92)
d) Thickened dermis from oedema of distal leg, A/chicken/Queretaro/14589-660/94 (H5N2)
e) Severe pulmonary oedema and haemorrhage in the lung, A/Hong Kong/156/97 (H5N1) (85)
f) Petechial haemorrhages in epicardial fat, A/chicken/NJ/12508/86 (H5N2) (91)
g) Submucosal haemorrhage surrounding ducts of glands in proventriculus, A/chicken/Hong Kong/156/97 (H5N1) (85)
h) Multifocal haemorrhage in the fascial plane of the gastrocnemius muscle (pars intermedia), A/chicken/Hong Kong/220/1997 (H5N1) (94)
i) Haemorrhage in lymphoid tissue of Peyer's patches and Meckel's diverticulum of the jejunum, A/Hong Kong/220/97 (H5N1)
j) Haemorrhage in caecal tonsils and rectum, A/Hong Kong/483/97
k) Bile-stained loose droppings from a 2-week-old Pekin duck, A/Egret/HK/757.2/02 (H5N1) (94)
l) Two-week-old Embden goose with torticollis, A/chicken/Hong Kong/220/1997 (H5N1) (68)
m) Mottling of the pancreas in a 2-week-old Embden goose, A/chicken/Hong Kong/220/1997 (H5N1) (68)

Fig. 1
Gross lesions in chickens, ducks and geese following experimental infection with highly pathogenic avian influenza viruses



a) Severe congestion with interstitial oedema in lung of a chicken, A/Ck/Indonesia/7/03 (H5N1). Hematoxylin and eosin stain. 400× magnification
b) Avian influenza viral antigen (in red) in vascular endothelium (arrow) and phagocytic leukocytes within the pulmonary parenchyma and smaller caliber interstitial vessels in the same tissue section. Immunohistochemical stain. 400× magnification
c) Avian influenza viral antigen (in red) in nasal epithelial cells of a 2-week-old duck, A/crow/Thailand/04 (H5N1). Immunohistochemical stain. 400× magnification
d) Multifocal neuronal necrosis and vacuolation (arrows) of neuropil in the cerebellum of a 2-week-old duck 2, A/egret/HK/757.2/02 (H5N1). Hematoxylin and eosin stain. 200× magnification
e) Avian influenza viral antigen (in red) in neurons and glial cells in the same tissue section. Immunohistochemical stain. 200× magnification
f) Intranuclear and intracytoplasmic avian influenza viral antigen staining (in red) in cardiac myocytes in the heart of a 2-week-old duck, A/Dk/VN/218/05 (H5N1). Immunohistochemical stain. 400× magnification
g) Focal vacuolar degeneration to necrosis of adrenal cortical and medullary chromaffin cells (arrows) in a 2-week-old duck, A/Dk/VN/218/05 (H5N1). Hematoxylin and eosin stain. 200× magnification
h) Diffuse staining for avian influenza viral antigen (in red) on the same tissue. Immunohistochemical stain. 200× magnification
i) Avian influenza viral antigen (in red) in parasympathetic ganglia in the intestinal wall of a 2-week-old Pekin duck, A/Dk/VN/218/05 (H5N1). Immunohistochemical stain. 400× magnification
j) Severe vacuolation and necrosis of the pancreatic acinar epithelium of a 5-week-old duck, A/Dk/VN/218/05 (H5N1). Hematoxylin and eosin stain. 200× magnification
k) Diffuse staining for avian influenza virus (in red) on the same tissue. Immunohistochemical stain. 200× magnification
l) Avian influenza viral antigen (in red) in the myocardial cells of skeletal muscle of a 2-week-old duck, A/Dk/VN/218/05 (H5N1). Immunohistochemical stain. 400× magnification

Fig. 2
Histological lesions in chickens, ducks and geese following experimental infection with highly pathogenic avian influenza viruses

Non-gallinaceous bird species

Wild birds

There were few reports of HPAIV infections and lesions in wild birds prior to 2002, except during 1961 when H5N3 HPAIV caused high mortality in common tern (*Sterna hirundo*) in South Africa (7). Since 2002, the Eurasian-African H5N1 HPAIV lineage has caused infections, illness and death in a variety of wild aquatic and terrestrial birds.

Domestic ducks and geese

Prior to 2002 HPAIV infrequently produced disease or mortality in domestic ducks. In Italy during 1999 and 2000, natural infections with H7N1 HPAIV caused deaths in Muscovy ducks (*Cairina moschata*). The brain was the primary target, with lesions and viral antigen (14). Experimentally, A/fowl/Germany/34 (H7N1) (FPV Rostock) HPAIV produced death in domestic ducks (2). However, with most HPAIV, experimental infection of domestic Pekin ducks has resulted in either no or only limited virus replication and few clinical signs (2, 3, 68). Since 2002, the pathobiology of HPAI infections in domestic ducks has changed, with Eurasian-African lineage H5N1 HPAIV replicating systemically and causing disease and death in domestic ducks under natural and experimental conditions (24, 32, 40, 50, 59, 63, 64, 83, 84). Experimental inoculation of ringed teals (*Callonetta leucophrys*) with an H7N7 HPAIV by the intranasal and intratracheal route induced conjunctivitis (107). In geese (*Anser anser domesticus*), neurological disease and lesions were experimentally induced after inoculation with an H5N1 HPAIV from 1997 (Fig. 1l) (68).

Ratites

Ostriches (*Struthio camelus*) with natural HPAIV infections have had reduced activity and decreased appetite, and exhibited open mouth breathing, ruffled feathers, sneezing, and nervous signs, including tremors of the head and neck, torticollis, incoordination, and paralysis of the wings. Individual birds had oedema of head and neck, severe haemorrhagic enteritis, enlarged and firm pancreas from necrosis, mild to severe air sacculitis, hepatitis, peritonitis, and enlargement of kidneys and spleen.

Unique pathobiology of Eurasian-African lineage H5N1 highly pathogenic avian influenza virus

Over the past 12 years, individual strains of the Eurasian-African lineage of the H5N1 HPAIV have changed to express greater virulence and altered pathobiological features in certain domestic waterfowl and wild bird species (24, 40, 59, 63, 64, 83, 84, 93, 106). In experimental studies with various bird species, virus strains from the first outbreaks in Hong Kong were divided into four groups based on pathology, morbidity, mortality and the sites of virus replication (Table III) (70). Pathobiological Group One contained gallinaceous birds who had the most severe disease, i.e. systemic AIV infection, 100% morbidity, >75% mortality, severe

Table III

Summary data obtained from the intranasal inoculation of multiple avian species with early Eurasian-African H5N1 lineage highly pathogenic avian influenza virus (A/chicken/Hong Kong/220/97) (70)

Species	Pathobiological group	Morbidity [a]	Mortality [a]	Gross lesions [b]	Histological lesions [b]	Viral antigen [c]	Virus re-isolation [d]
Chickens, turkeys, quails, guineafowls pheasants, partridges and zebra finches	1	+++	+++	+++	+++	+++	+++
Domestic geese, emus, house finches and budgerigars	2	++/+++	-/++	-/+	+/++	+/+++	++
Domestic ducks, house sparrows and gulls	3	-/+	-	-	-/+	-/+	+/-
Starlings and pigeons	4	-	-	-	-	-	+/-

a) Morbidity and mortality
+++ = ≥ 75%
++ = 50% to 74%
+ = less than 50%
- = none

b) Gross and histological lesions
+++ = lesions common and in multiple organs
++ = lesions sporadic and in few organs
+ = lesions infrequent
+/- = lesions rare and mild

c) Viral antigen
+++ = widespread
++ = multifocal
+ = infrequent
+/- = rare
- = no viral antigen

d) Virus re-isolation
+++ = high viral titres ($10^{5.0}$ mean embryo lethal dose [ELD_{50}] per gram of tissue) obtained consistently from the brain, lung, and kidney
++ = high viral titres ($10^{5.0}$ ELD_{50}/g tissue) obtained primarily from brain
+/- = low to moderate viral titres ($10^{4.1}$ ELD_{50}/g tissue) obtained from lung and/or kidney, negative re-isolation from brain, lung, or kidney

listlessness before death and some neurological dysfunction, but some birds died peracutely and lacked clinical signs. Pathobiologically, chickens and turkeys were most severely affected, dying within two days of inoculation, and virus replicated predominantly in vascular endothelium and phagocytic leukocytes. The other gallinaceous birds and zebra finches (*Taeniopygia guttata*) survived longer than chickens and turkeys, and had disseminated virus replication in various parenchymal cells within the brain, heart, lung, pancreas, skin and adrenal gland, along with associated necrotic and inflammatory lesions. The Eurasian-African H5N1 HPAIV have all been highly lethal in chickens, but they have expressed some variation in pathobiological features, principally a range of intravenous mean death times (MDT) from 1 to 4.1 days and intranasal MDT from 1.5 to 5.5 days (50, 59, 85, 88, 106). Group Two contained domestic geese, emus, house finches (*Carpodacus mexicanus*), and budgerigars (*Melopsittacus undulatus*) who exhibited delayed morbidity, <75% mortality, and severe lesions in two to three critical organs, predominantly the brain with associated neurological signs, and secondarily the heart and pancreas. Group Three contained domestic ducks, house sparrows (*Passer domesticus*) and laughing gulls (*Larus atricilla*) that had minimal morbidity, lacked mortality, and had low titre virus replication, usually in the respiratory tract and occasionally in the heart and gonads. Group Four contained rock pigeons (*Columba livia*) and European starlings (*Sturnus vulgaris*) that lacked morbidity and mortality, and no virus replication was evident.

Domestic ducks

The Eurasian-African lineage of H5N1 HPAIV has evolved over the past 12 years into 10 distinct genetic lineages (clades 0 to 9) and multiple sublineages (e.g. 2.1.1, 2.1.2, etc.). Over the same period, divergent strains have developed and many have expressed distinct pathobiological features and increased virulence for various bird species. The early Hong Kong isolates (1997 to 2000) replicated only in the respiratory tract of domestic ducks and produced associated mild respiratory lesions and no morbidity or mortality (68). Similarly, intranasal inoculation of domestic ducks with H5N1 HPAIV strains isolated from ducks in China (1999 to 2002) produced respiratory and alimentary tract infection, but no illness or death (Table IV) (19). However, in 2001, an H5N1 HPAIV was isolated from frozen duck meat imported from China into South Korea (106). In intranasally inoculated domestic ducks, this virus replicated and spread systemically and was isolated and visualised in muscle, heart and brain, but did not produce clinical signs or death. Strains isolated from captive waterfowl in Hong Kong during 2002 produced high mortality in experimentally inoculated young domestic ducks, with systemic infection and high virus titres within the respiratory tract, heart and brain, while other strains from Southeast Asia produced low mortality with neurological lesions and disease (32, 50, 63, 83, 84). Domestic ducks experimentally inoculated with three H5N1 HPAIV isolates from Thailand from 2004 induced

Table IV
Data from experimental studies in domestic ducks following intranasal inoculation with H5N1 highly pathogenic avian influenza virus

Species	Virus	Sick/dead/total	MDT (days)	Virus isolation titre*		Remarks and references
				Oropharyngeal	Cloacal	
Sheldrake ducks (*Tadorna* spp.)	DKGD/12/00	0/0/5	–	–	–	3-week-old ducks; $10^{7.85-8.5}$ EID_{50} inoculum; titres at 3 dpi in $CCID_{50}$ (18)
	DKZJ/11/00	0/0/5	–	<2.0-4.3	<2.0-3.7	
	DKFJ/17/01	0/0/5	–	<2.0-2.7	–	
	DKGX/35/01	0/0/5	–	<2.0-4.0	<2.0-4.0	
	DKSH35/02	0/0/5	–	<2.0-3.5	<2.0-4.3	
	DKFJ/01/02	0/0/5	–	–	<2.0-3.5	
Pekin ducks (*Anas platyrhynchos* spp.)	A/chicken/Yamaguchi/7/04	0/0/3	–	5.5	NA	10^8 EID_{50} inoculum; average titres from trachea (EID_{50}/g) (40)
	A/duck/Yokohama/03	2/0/3	–	4.7		
	HK/483/97	0/0/3	–	4.5		
	Tn/SA/6	0/0/3	–	–		
Call ducks (*Anas platyrhynchos*)	A/chicken/Yamaguchi/7/04	4/0/9	–	NA	NA	2-week-old ducks; 10^6 EID_{50} inoculum (114)
Pekin ducks (*Anas platyrhynchos*)	A/chicken/Suphanburi/1/04	8/5/8	6.0	2.2/3.5	3.2/3.6	4-week-old ducks; 10^6 EID_{50} inoculum; approximate titres at 4 dpi (74)
	A/quail/Angthong/71/04	8/5/8	6.0	NA		
	A/duck/Angthong/72/04	4/5/8	6.0	NA		
Cross-bred ducks (*Anas platyrhynchos*)	A/chicken/Suphanburi/1/04	0/4/8	6.3	NA	NA	4-week-old ducks; 10^6 EID_{50} inoculum (74)
	A/quail/Angthong/71/04	0/4/8	5.3			
	A/duck/Angthong/72/04	0/6/8	4.8			

*Titres expressed as mean embryo infective dose (EID_{50}) per millilitre unless otherwise stated
CCID: mean cell culture infective dose
MDT: mean death time
NA: not available

50% to 75% mortality with neurological signs, but less severe disease was produced in mallard–domestic cross-bred ducks (Table IV) (74). Feather lesions have been reported in domestic ducks infected with an H5N1 HPAIV (114).

Over the past 12 years, H5N1 HPAIV in domestic ducks have changed from all being in Pathobiological Group Three to some strains in Group Two, and most recently, a few in Group One. Although some H5N1 HPAIV are Pathobiological Group One in both two-week-old ducklings and chickens, the underlying pathophysiological mechanisms are different. The viruses primarily caused severe vascular damage in chickens resulting in severe pulmonary oedema, congestion, haemorrhage and microthrombosis in capillaries (92), while in domestic ducks the virus replicated and caused damage in multiple organs including the respiratory tract, the pancreas, central nervous system, adrenal glands, and myocardium (Fig. 2) (45, 63, 94, 114). In domestic ducks, high lethality was age-dependent and most severe in young ducks, whereas in chickens, it was age-independent (63, 94). Interestingly, Vietnam isolates since 2005 have shown increased virulence in ducks compared to those prior to 2005, as evident by shorter MDT in two-week-old ducks and 100% mortality in five-week-old ducks (Table V) (94). Such enhanced virulence is the result of an expanded tissue tropism and higher virus replication titres in tissues. Field observations of increased mortality in domestic ducks infected with H5N1 HPAIV in Vietnam corroborate the experimental results of increased virulence of the newer strains for ducks (113).

Non-poultry birds

Beginning in 2002 with isolation of new strains of H5N1 HPAIV in Hong Kong, H5N1 HPAIV have emerged with the ability to cause severe illness and death in captive water birds of diverse genetic backgrounds. In the six years that followed, H5N1 HPAIV were isolated from individual wild birds, including gulls and shorebirds (Order: Charadriiformes); storks, herons, and egrets (Order: Ciconiiformes); pigeons and doves (Order: Columbiformes); eagles, goshawks, kestrel, falcon, buzzard and kites (Order: Falconiformes); coots, moorhen and swamphen (Order: Gruiformes); crows, magpies, sparrows, starlings, finches, mesias, munias and mynahs (Order: Passeriformes); pelicans and cormorants (Order: Pelecaniformes); flamingoes (Order: Phoenicopteriformes); grebes (Order: Podicipediformes); and owls (Order: Strigiformes) (19, 24, 25, 61). With the H5N1 HPAI outbreak in captive water birds in Hong Kong during 2002, the range of pathological changes reported resembled those previously identified in chickens infected with H5N1 virus, but with more severe lesions in the respiratory tract and more extensive neurological lesions in the captive birds than typically reported in chickens (19). After 2002, H5N1 HPAIV caused only sporadic deaths in wild birds in Southeast Asia (61) until the spring of 2005, when large numbers of bar-headed geese died in Qinghai Lake, China (19), as did various swans and other aquatic birds in Europe during the winter of 2006 (72). Neurological lesions were especially prominent.

Captive, non-domestic ducks (Order: Anseriformes)

Relatively few studies have examined H5N1 HPAIV infection in non-domestic ducks, but the results of two such studies are summarised in Table VI. Intranasal inoculation of mallard, northern pintail, blue-winged teal, redhead, and wood ducks with H5N1 HPAIV (A/whooper swan/Mongolia/244/05 and A/duck meat/Anyang/AVL-1/01) produced disease and death only in wood ducks (10). Only wood ducks exhibited clinical signs, which included ruffled feathers, cloudy eyes, rhythmic dilation and constriction of the pupils, tremors, incoordination, severe weakness, and seizures. Individual birds shed virus

Table V

Mortality, mean death times and viral replication titres from oropharyngeal and cloacal swabs of 2-week-old Pekin ducks inoculated intranasally with Asian-origin H5N1 highly pathogenic avian influenza virus

(59, 63, 94, and unpublished data)

Virus [a]	Clade	Mortality [b]	MDT (days)	Virus isolation titres 3 days post inoculation [c]	
				Oral	Cloacal
A/duck/Vietnam/88/07	2.3.4	8/8	4	3.9	2.3
A/duck/Vietnam/10/07	1	8/8	3.2	5.5	3.0
A/duck/Vietnam/218/2005	2.3.2	8/8	2.7	6.5	3.3
A/duck/Vietnam/203/2005	2.3.4	8/8	3.4	4.8	1.5
A/Vietnam/1203/2004	1	7/8	4.2	4.9	2.0
A/goose/Vietnam/113/2001	1	0/8	–	1.8	<1.6

a) Ducks were inoculated intranasally with 10^5 mean embryo infective dose (EID_{50}) of the viruses
b) Number of dead ducks/number of inoculated or exposed ducks
c) Mean $\log_{10}$ titres expressed as EID_{50}/ml from oropharyngeal and cloacal swabs were sampled from three individual ducks. The limit of detection was $10^{0.9}$ EID_{50}/ml
MDT: mean death time

from oropharynx and cloaca for four to six days and in high titres, and had severe diffuse neuronal necrosis in the brain, necrotising pancreatitis and adrenalitis, and multifocal necrosis in the heart. The mallards, northern pintail, blue-winged teal and redhead ducks lacked clinical signs but were infected, shedding low levels of virus for one to three days. Common lesions and their severity in ducks and other avian species are summarised in Table VII. In another study, six species of ducks (two species of diving ducks and four species of dabbling ducks) were infected with A/turkey/Turkey/1/2005. The infection caused clinical signs in only the diving ducks (tufted ducks and pochards). In contrast, the remaining four species were clinically unaffected. Clinical signs, which were more severe in tufted ducks than in pochards, developed at three to four days post inoculation and consisted of laboured breathing, increased recumbency, and neurological signs (39).

Swans (Order: Anseriformes)

Experimental studies of H5N1 HPAIV in swans are summarised in Tables VII and VIII. During the H5N1 HPAI outbreaks in Europe of 2006, swans were the most

Table VI
Data from experimental studies in wild and captive duck species following intranasal inoculation with H5N1 highly pathogenic avian influenza virus

Species	Virus	Sick/dead/total	MDT (days)	Virus isolation titre*		Remarks and references
				Oropharyngeal	Cloacal	
Blue-winged teal (*Anas discors*)	A/whooper swan/Mongolia/244/05	0/0/3	–	3.8 (2) [a]	1.0 (1)	Ducks of 10 to 16 weeks of age; 10^6 EID_{50} inoculum;
Redhead (*Aythya Americana*)		0/0/3	–	2.8 (1-4)	1.2 (1)	titres are average maximum titres (10)
Wood duck (*Aix sponsa*)		2/2/3	7.5	4.6 (4-6)	3.8 (2-3)	
Northern pintail (*Anas acuta*)		0/0/3	–	1.5 (1-2)	1.0 (1)	
Blue-winged teal (*Anas discors*)	A/duck meat/Anyang/AVL-1/01	0/0/3	–	2.0 (1-2)	–	Ducks of 10 to 16 weeks of age; 10^6 EID_{50} inoculum; titres are average maximum titres
Redhead (*Aythya Americana*)		0/0/3	–	4.0 (4)	–	(10)
Wood duck (*Aix sponsa*)		2/1/3	8	5.0 (7)	2.8 (4-5)	
Northern pintail (*Anas acuta*)		0/0/3	–	1.1 (1-4)	–	
Mallard (*Anas platyrhynchos*)		0/0/3	–	2.1 (1-2)	1.0 (1)	
Tufted duck (*Aythya fuligula*)	A/turkey/Turkey/1/2005	4/3/4	4	2.5	–	10^4 $CCID_{50}$ inoculum; average titres at 2 dpi in $CCID_{50}$/ml
Eurasian pochard (*Aythya ferina*)		3/1/4	4	3.0	<1.0	(39)
Mallard (*Anas platyrhynchos*)		0/0/4	–	2.2	–	
Common teal (*Anas crecca*)		0/0/4	–	<1.0	–	
Eurasian wigeon (*Anas penelope*)		0/0/4	–	<1.0	–	
Gadwall (*Anas strepera*)		0/0/4	–	–	–	

* virus titres expressed as mean embryo infective dose per millilitre unless otherwise stated
a) Figures in parentheses indicate the duration of shedding in days
CCID: cell culture infective dose
MDT: mean death time

Table VII
Microscopic lesions and distribution of H5N1 highly pathogenic avian influenza virus antigen in tissues from experimentally infected avian species

Location of lesion	Species of bird						Type of lesion (Viral antigen stained cell types)
	Wild ducks (10, 39)	Geese (11, 65, 68)	Swan (11, 38)	Pigeons (41, 68)	Gulls (10, 12, 69)	Crows (96)	
Nasal cavity		+	+				Epithelial necrosis, rhinitis, sinusitis (Epithelial cells, vascular endothelial cells)
Trachea		+	+				Tracheitis (Epithelial cells, vascular endothelium)
Lung	+	+	+				Oedema, bronchointerstitial pneumonia (Vascular endothelium, mononuclear cells)
Air sac	+						Epithelial necrosis (Epithelial cells)
Esophagus		+					No lesion (Epithelium, vascular smooth muscle, smooth muscle of muscularis externa, mucous glands)
Proventriculus		+	+				No lesion (Epithelium, muscularis mucosa, vascular smooth muscle, parasympathetic ganglia)
Enteric tract	+	+				+	Haemorrhage, epithelial necrosis, enteritis (Parasympathetic ganglia of the submucosa and myenteric plexi, mucosal smooth muscle, vascular endothelium)
Cecal tonsils		+	+				No lesion (Parasympathetic ganglia)
Bursa			+				Lymphoid depletion, phagocytic cell hyperplasia, necrosis (Phagocytic cells, bursa epithelium)
Thymus	+						No lesion (Thymic epithelium, phagocytic cells)
Pancreas	+	+	+		+	+	Vacuolation, pancreatic necrosis, pancreatitis (Exocrine acinar cells)
Adrenals	+	+	+		+	+	Adrenal necrosis, adrenalitis (Corticotropic and chromaffin cells)
Liver	+		+		+	+	Hepatocellular degeneration and necrosis (Hepatocyte, Kupffer's cells)
Spleen		+	+			+	Lymphoid depletion, necrosis, splenitis, hyperplasia of macrophage-phagocytic cells, hematochromatosis (Vascular smooth muscle., endothelial cells, phagocytes)
Kidney	+	+	+				Tubule necrosis (Tubular epithelium)
Muscle	+	+			+		Myofibre degeneration (Vascular smooth muscle, myocytes)
Heart	+	+	+		+	+	Myocyte necrosis, myocarditis (Myocytes)
Brain	+	+	+	+	+	+	Oedema of neuropil, neuronal necrosis, gliosis, lymphoplasmacytic perivascular cuffing (Neurons, glial cells, ependymal cells, choroid plexus epithelium, endothelial cells, gitter cells)
Spinal cord, eye, peripheral nerves			+				No lesion (Neuron; eye retina: cells of the pigmented epithelial layer, photoreceptor cells, and cells of the outer and inner nuclear layers)
Ovary/testis	+		+				Necrosis, inflammation
Feather follicles			+				Necrosis of feather follicular epithelium (Feather follicular epithelium)

Table VIII
Data from experimental studies in swans and geese following intranasal inoculation with H5N1 highly pathogenic avian influenza virus

Species	Virus	Sick/dead/total	MDT (days)	Virus isolation titre*		Remarks and references
				Oropharyngeal	Cloacal	
Black swan (*Cygnus atratus*)	A/whooper swan/ Mongolia/244/05	5/5/5	2.5	6.46 (2-3) [a]	4.94 (1-2)	Birds of 5 to 6 weeks of age; 10^6 EID_{50} inoculum; titres are average maximum titres (11)
Trumpeter swan (*C. buccinator*)		5/5/5	5.0	6.14 (4-6)	3.18 (2-5)	
Whooper swan (*C. cygnus*)		4/4/4	4.0	6.3 (4-6)	4.25 (3-5)	
Mute swan (*C. olor*)		5/5/5	6.5	5.58 (3-7)	4.46 (3-4)	
Mute swan (*C. olor*)	A/Cygnus cygnus/ Germany/R65/2006	4/4/4	6.2	3.3 (1-6)	1.3 (2-6)	Birds of 1 to 4 years of age; 10^6 EID_{50} inoculum; oculo-oronasally inoculation; average titres at 3 dpi ($CCID_{50}$/ml) (38)
Embden goose (*Anser anser domesticus*)	A/chicken/HK/220/97	5/0/11	–	1.8	2.4	2-week-old birds; 10^6 EID_{50} inoculum (68)
Cackling goose (*Branta hutchinsii*)	A/whooper swan/ Mongolia/244/05	4/3/4	6.0	5.25 (4-6)	3.05 (2-5)	12-week-old birds; 10^6 EID_{50} inoculum; titres are average maximum titres (11)
Bar-headed goose (*Anser indicus*)	A/whooper swan/ Mongolia/244/05	5/2/5	6.5	5.10 (5-8)	2.55 (0-7)	
Canada goose (*Branta canadensis*)	A/chicken /Vietnam/14/2005	5/5/5	~5.0	NA	NA	89-day-old birds; 1.7 X 10^5 PFU inoculum; birds died or were euthanised by 5 dpi (65)
Chinese white goose (*Anser cygnoides*)	A/Gs/HK/437-4/99	3/3/3	7-8	NA	NA	Birds of 3 to 4 weeks of age; $10^{6.5}$ EID_{50} inoculum (110)
	A/Gs/HK/485-3/00	3/0/3	–	NA	NA	

* Virus titres are expressed as mean embryo infective dose (EID_{50}) per millilitre unless otherwise stated
a) Figures in parentheses indicate the duration of virus shedding in days
dpi: days post inoculation
CCID: cell culture infective dose
MDT: mean death time
NA: not available
PFU: plaque forming unit

frequent birds affected and were designated as an indicator species (102, 103). Mute (*Cygnus olor*) and whooper (*Cygnus cygnus*) swans that died of natural infection had nervous signs that included somnolence, incoordination and ataxia (102). In experimental studies, multifocal pancreatic haemorrhage and necrosis, pulmonary congestion and oedema, and subpericardial haemorrhages were the most frequent gross lesions observed. Histologically, necrosis and inflammation were common in the brain, pancreas and liver, and less common in the spleen and the adrenal and submucosal lymphoid patches of the small intestine ('Peyer's patches'). Avian influenza virus antigen was present in the pancreas, adrenal gland, liver, and brain. Death was attributed to the systemic viral infection.

Experimental infection of four species of swans – whooper swan, black swan (*Cygnus atratus*), trumpeter swan (*Cygnus buccinator*), and mute swan – with an H5N1 HPAIV produced 100% mortality in the four species. Black swans were the most susceptible species with MDT of 2.5 days and clinical signs, lesions and viral distribution similar to those in gallinaceous poultry (11). In mute swans, two parallel courses of pathogenesis with predominantly endothelial or epithelial/neuronal infections were described; pre-existing avian influenza virus-specific antibodies can be an efficient modulator of the outcome of an infection with HPAIV (38). Of interest were the asymptomatic infection and shedding for 4.5 days in mute swans, which indicate their potential to transmit the virus over short migratory distances (11).

Geese (Order: Anseriformes)

Experimental studies of H5N1 HPAIV in domestic and captive geese are reported in Tables VII and VIII. For domestic geese (*Anser anser domesticus*), neurological disease and brain and pancreatic lesions were reported following inoculation with 1997 H5N1 HPAI virus (Fig. 11

and Fig. 1m) (68). Field reports from Asia and Europe indicated that H5N1 HPAIV produced sporadic deaths in naturally infected Canada geese (*Branta canadiensis*) (24, 102). Experimentally, Canada geese were susceptible to H5N1 HPAIV infection and such susceptibility was dependent on the age and immunological status of the animal (65). Juvenile birds had clinical signs including severe listlessness, inappetence, bright yellow diarrhoea, ruffled feathers, hunched posture, repetitive jerking head movements, weakness, staggering gait, distress vocalisation, wing droop, and terminal coma. The most consistently affected tissues were the brain, spinal cord, parasympathetic ganglia of the gastrointestinal tract, heart, and pancreas. Two species of geese, the bar-headed goose (*Anser indicus*) and the cackling goose (*B. hutchinsii*) presented clinical signs including severe listlessness and marked neurological signs, several of the birds died (11). Cackling geese were more susceptible than bar-headed geese. Common lesions included necrosis and heterophilic to lymphoplasmacytic inflammation along with viral antigen in the brain, pancreas, liver and adrenal glands. Survivors had transient cloudy eyes from corneal oedema.

Gulls (Order: Charadriiformes)

Experimental studies of H5N1 HPAIV in gulls are reported in Tables VII and IX. Mortality associated with natural infections of Eurasian-African lineage H5N1 HPAIV has been reported in brown-headed gulls (*Larus brunnicephalus*), great black-headed gulls (*Larus ichthyaetus*), and black-headed gulls (*Larus ridibundus*) (24, 53). Experimentally, laughing gulls exhibited high morbidity and mortality after intranasal inoculation with two strains of H5N1 HPAI virus (10). Another study described the susceptibility of herring gulls (*Larus argentatus*) for two strains of H5N1 HPAIV, but it varied between different virus strains (12). Among the clinical signs were lethargy and weakness, and in more severe cases neurological signs consisting of seizures, head-tilt, head tremors, torticollis and imbalance. Laughing gulls had cloudy eyes and petechial haemorrhages in the ventriculus, apex of the heart, cerebrum and pancreas. Necrotising pancreatitis and cerebral neuronal necrosis were the most common lesions, with some having necrotising adrenalitis (10). Gulls that survived to 14 days had lymphoplasmacytic perivascular encephalitis and heterophilic pancreatitis. Herring gulls had similar lesions, with the addition of moderate myocardial degeneration and necrosis with mild heterophilic myocarditis (12). This study also provided preliminary experimental evidence to indicate that herring gulls can be infected by some H5N1 HPAIV by ingesting infective chicken meat and, potentially, could contribute to the geographical spread of virus.

Pigeons (Order: Columbiformes)

Experimental studies of H5N1 HPAIV in rock doves (pigeons, *Columba livia*) are reported in Tables VII and X. Historically, pigeons have been considered resistant to infection, illness and death following exposure to HPAIV (37). Sporadic cases of fatal infection have been identified in pigeons with the Eurasian-African H5N1 HPAIV. Intranasal inoculation of pigeons with A/chicken/Hong Kong/220/1997 H5N1 HPAIV failed to produce infection, and inoculation with two Chinese H5N1 HPAIV produced rare infection without clinical signs (55, 68). However, recent studies in pigeons inoculated intranasally using high doses (10^6 and 10^8 EID_{50}/bird) of three H5N1 HPAIV isolated from Thailand (2004) and Indonesia (2003) produced infrequent illness and death (41, 88). Although most pigeons did not become ill, some of the asymptomatic birds were infected, and virus was shed from the oropharynx and cloaca. Neurological signs were observed in some pigeons, with the most severe lesions and highest virus titres in the brain. Lesions included severe neuronal necrosis in the brain, moderate necrosis of autonomic ganglia with accompanying lymphocytic ganglioneuritis, severe degeneration and necrosis in cardiac myocytes, mild necrosis of the adrenal cortical cells and rare foci of pancreatic acinar necrosis. Viral antigen was common in neurons and ependyma of the brain, autonomic neurons, and cardiac myocytes, and AIV antigen was sporadic in skeletal muscle fibres, adrenal cortical cells, granulocytes, capillary endothelium, pancreatic acinar cells and smooth muscle of large arteries. Contact exposed pigeons did not become infected, suggesting that transmission is inefficient and pigeons are unlikely to be a reservoir. In other studies, young and adult pigeons did not become infected after experimental exposure to five different isolates of H5N1 HPAIV (54), and pigeons inoculated with four different H5N1 HPAIV did not show clinical disease. Virus recovery varied between the virus strains, with one strain unable to be reisolated (8).

Perching or song birds (Order: Passeriformes)

Experimental studies of H5N1 HPAIV in perching or song birds (Order: Passeriformes) are reported in Tables VII and X. Natural infections with deaths have been associated with H5N1 HPAIV for corvids (Family: Corvidae) including crows, magpies and rooks (44, 101). American crows (*Corvus brachyrhynchos*) intranasally inoculated with an H5N1 HPAIV from Thailand developed listlessness, hunched posture, ruffled feathers and loss of appetite (88). The most severely affected birds had pancreatitis with necrosis, non-suppurative encephalitis, splenic and hepatic haemochromatosis, myocarditis with necrosis, lymphocytic adrenalitis, and myenteric ganglioneuritis. Viral antigen was demonstrated in neurons, pancreatic acinar cells, and granulocytes and precursors in bone marrow. These lesions were similar to those reported for H5N1 HPAIV natural infections in large-billed crows (*Corvus macrorhynchos*) and the Korean magpie (*Pica pica sericea*) (44, 101).

Table IX
Data from experimental studies in gulls following intranasal inoculation with H5N1 highly pathogenic avian influenza virus

Species	Virus	Sick/dead /total	MDT (days)	Virus isolation titre* Oropharyngeal	Cloacal	Remarks and reference
Laughing gull (*Larus atricilla*)	A/chicken/HK/220/97	0/0/8	–	<0.97	<0.97	Birds of 2 to 3 weeks of age; 10^6 EID_{50} inoculum (69)
	A/whooper swan/Mongolia/244/05	3/2/3	7.5	4.2 (7-8) [a]	2.6 (4-7)	12-week-old birds; 10^6 EID_{50} inoculum; titres are average maximum titres (10, 12)
	A/duck meat/Anyang/AVL-1/01	3/2/3	7.5	5.0 (6-10)	2.0 (3-6)	
Herring gull (*Larus argentatus*)	A/whooper swan/Mongolia/244/05	3/2/3	5.0	3.89 (4.3)	2.07 (3.0)	
	A/duck meat/Anyang/AVL-1/01	3/0/3	–	3.89 (5.0)	1.96 (2.3)	

*Virus titres are expressed as mean embryo infective dose (EID_{50}) per millilitre
a) Figures in parentheses indicate the duration of shedding in days
MDT: mean death time

Table X
Data from experimental studies in sparrows, starlings, pigeons and crows following intranasal inoculation with H5N1 highly pathogenic avian influenza virus

Species	Virus	Sick/dead/total	MDT (days)	Virus isolation titre (EID_{50}/ml) Oropharyngeal	Cloacal	Remarks and references
American crow (*Corvus brachyrhynchos*)	A/crow/ Thailand/1C/04	2/2/2	8-9	<4 (1-8) [a]	<2 (2-8)	10^6 EID_{50} inoculum (88)
Zebra finch (*Taeniopygia guttata*)	A/chicken/Hong Kong/220/97	7/7/9	3-5	NA	NA	Adult birds; 10^6 EID_{50} inoculum (71)
House finch (*Carpodacus mexicanus*)		7/4/11	6-13	NA	NA	
House sparrow (*Passer domesticus*)		3/0/7	–	NA	NA	
Starling (*Sturnus vulgaris*)		0/0/4	–	NA	NA	
Budgerigar (*Melopsittacus undulatus*)		6/6/10	5-9	NA	NA	
House sparrow (*Passer domesticus*)	A/duck/Thailand/144/05	3/3/3	4.2	2.4	1.7	Adult birds; 10^6 EID_{50} inoculum; titres at 2 dpi (8)
	A/quail/Thailand/551/05	3/3/3	6.3	1.0	<1	
	A/CM/HK/645/06	2/2/3	<6.3	2.6	0.8	
	A/JW/HK/1038/06	3/3/3	<6.3	2.1	<1	
Starling (*Sturnus vulgaris*)	A/duck/Thailnad/144/05	0/0/3	–	3.8	0.8	
	A/CM/HK/645/06	0/0/3	–	3.3	0.8	
	A/JW/HK/1038/06	0/0/3	–	2.5	1	
Pigeon (*Columba livia*)	A/chicken/HK/220/97	0/0/10	–	NA	NA	4-week-old birds; 10^6 EID_{50} inoculum (68)
Carneau pigeon (*Columba* spp.)	A/duck/Thailand/144/05	0/0/3	–	<1	<1	6-week-old birds; 10^6 EID_{50} inoculum; titres at 3dpi (8)
	A/quail/Thailand/551/05	0/0/3	–	<1	0.5	
	A/CM/HK/645/06	0/0/3	–	1.9	<1	
	A/JW/HK/1038/06	0/0/3	–	0.5	<1	
Pigeon (*Columbia livia f. domestica*)	A/chicken/Indonesia/2003	5/5/14	11.4	NA	NA	4-month-old birds; 10^8 EID_{50} inoculum (41)
Pigeon (*Columba livia*)	A/chicken/HK/220/97	0/0/6	–	NA	NA	10^6 EID_{50} inoculum (88)
	A/crow/Thaliland/1C/2004	1/1/6	6			
	A/pigeon/Thailand/1B/04	0/0/6	–			
Pigeon (*Columba livia*)	A/Ck/Huabei/H5N1/04	0/0/13	–	0	0	Adult birds; 5 X 10^4 EID_{50} inoculum (54)

a) Figures in parentheses indicate the duration of shedding in days
dpi: days post inoculation
EID_{50}: mean embryo infective dose
NA: not available

Natural infections and deaths in small passerine birds such as tree (*Passer montanus*) and house sparrows (*Passer domesticus*) have been reported. In a quarantine station, 10% mortality was seen in mesias (*Leiothrix* sp.) with isolation or identification of H5N1 HPAIV, while samples from mynahs and black-throated laughing thrush (*Garrulax chinensis*) in the same facility were negative for HPAIV (21). In experimental intranasal inoculation studies with 1997 Hong Kong H5N1 HPAIV, zebra finches developed anorexia, listlessness, and >75% mortality within five days of inoculation (71). Histologically, necrosis with associated viral antigen was observed in multiple organs, especially the nasal cavity, brain, pancreas, spleen, adrenal glands, and ovary. Experimentally, house finches exhibited 64% morbidity, 36% mortality, anorexia, listlessness, and neurological signs. Typically, birds were moribund or dead within two days of the onset of clinical signs, with severe necrotic lesions in the brain and pancreas. By contrast, house sparrows had mild transient listlessness, no mortality, lacked gross lesions, and AIV antigen and histological lesions were observed only in the heart and testicle of a few birds. European starlings lacked clinical disease, mortality and gross and histological lesions.

By contrast, intranasal inoculation of house sparrows with four different H5N1 HPAIV isolated in Hong Kong in 2005 and 2006 caused death in 66% to 100% of the infected birds and high virus loads were detected in the brain and lung of deceased sparrows. In contrast, inoculation of European starlings with three of these viruses caused no deaths. However, virus was re-isolated from oral and cloacal swabs, indicating that starlings were infected by the viruses tested (8). In both species, the H5N1 HPAIV were not transmitted to contact birds.

Parrots (Order: Psittaciformes)

Natural cases have not been reported but experimental infection with H5N1 HPAIV caused high mortality in budgerigars (*Melopsittacus undulatus*) with multifocal necrosis in the brain and associated viral antigen in necrotic neurons (33, 71). In a private quarantine station in the United Kingdom, H5N1 HPAIV infections were confirmed in passerines imported from Asia, but H5N1 HPAIV infection was not identified in any of the psittacines in the same facility (21).

Pathogénie et pathobiologie de l'infection des oiseaux par le virus de l'influenza aviaire

M.J. Pantin-Jackwood & D.E. Swayne

Résumé

La capacité des virus de l'influenza aviaire de provoquer l'infection, la maladie ou la mort varie en fonction des souches virales et des espèces aviaires affectées. Les virus de l'influenza aviaire se répartissent en deux groupes, en fonction des caractéristiques pathobiologiques observées chez les poulets : virus de l'influenza aviaire faiblement pathogènes (IAFP) et virus de l'influenza aviaire hautement pathogènes (IAHP). Généralement, les virus de l'IAFP provoquent une infection asymptomatique chez l'avifaune aquatique, mais une fois introduits dans les populations de volailles domestiques, ils causent des infections soit asymptomatiques, soit accompagnées de signes cliniques et de lésions témoignant d'une atteinte pathophysiologique des systèmes respiratoire, digestif et reproducteur. Les virus de l'IAHP ont d'abord été observés dans les populations de gallinacées, où l'infection entraîne une forte morbidité et mortalité et une maladie systémique caractérisée par la nécrose et l'inflammation de nombreux organes viscéraux, du système nerveux, du système cardiovasculaire ainsi que du tégument. Bien que les virus de l'IAHP affectent exceptionnellement les oiseaux aquatiques domestiques ou les oiseaux sauvages, l'évolution très particulière qu'a connue la souche eurasienne/africaine H5N1 du virus de l'IAHP depuis une dizaine d'années en fait désormais un virus infectieux et pathogène pour les canards domestiques et les oiseaux sauvages, avec divers signes cliniques dont une atteinte asymptomatique du système respiratoire et du digestif, une maladie systémique affectant deux ou trois organes vitaux, généralement le cerveau, le cœur et le

pancréas, et, chez les gallinacées, une grave infection généralisée, suivie de la mort. L'infection expérimentale par inoculation intra-nasale du virus a été réalisée avec succès chez diverses espèces d'oiseaux sauvages; néanmoins, le caractère marginal de la transmission par contact chez certaines de ces espèces, par exemple les passereaux et les Colombiformes, indique que ces espèces ne jouent probablement pas un rôle de réservoir, contrairement à certains membres sauvages de l'ordre des Ansériformes qui sont sensibles à des formes graves de l'infection et pourraient jouer un rôle dans la dissémination du virus sur des distances moyennes.

Mots-clés
Influenza aviaire faiblement pathogène - Influenza aviaire hautement pathogène - Maladie aviaire - Pathobiologie - Pathogénie - Pathotype - Virus de l'influenza aviaire.

Patogénesis y patobiología de la infección por virus de la infuenza aviar en las aves

M.J. Pantin-Jackwood & D.E. Swayne

Resumen
La capacidad de los virus de la influenza aviar (IA) para causar infección, enfermedad y muerte varía en función de la especie avícola de que se trate. Atendiendo a las características patobiológicas observadas en pollos, los autores distinguen entre virus de la IA levemente patógena (virus IALP) y virus de la IA altamente patógena (virus IAAP). Por regla general, los virus IALP causan infecciones asintomáticas en las aves acuáticas salvajes, pero si son introducidos en bandadas domésticas puede ocurrir que provoquen infecciones asintomáticas o bien que induzcan lesiones y signos clínicos reveladores de trastornos patofisiológicos en los sistemas respiratorio, digestivo y reproductor. El virus IAAP, observado en un principio en aves gallináceas, provoca índices elevados de morbilidad y mortalidad, así como una enfermedad sistémica con necrosis e inflamación de varios órganos viscerales, los sistemas nervioso y cardiovascular y el integumento. Aunque el virus IAAP rara vez ha infectado a aves acuáticas domésticas o aves salvajes, en el último decenio los virus de la cepa H5N1 euroasiático-africana han adquirido la singular capacidad de infectar a los patos domésticos y las aves salvajes y de causar enfermedades que provocan una serie de síndromes, en particular infecciones asintomáticas del sistema respiratorio y el tracto digestivo, una enfermedad sistémica limitada a dos o tres órganos vitales, en general cerebro, corazón y páncreas, y una grave infección generalizada que resulta letal, observada en gallináceas de corral. Aunque a veces, en condiciones experimentales, se ha logrado provocar la infección de diversas especies de aves salvajes por inoculación intranasal, la ineficiencia de la transmisión por contacto en ciertos casos, por ejemplo en aves paseriformes y columbiformes, lleva a pensar que muy probablemente éstas no sean un reservorio del virus, mientras que otras aves, como las anseriformes salvajes, pueden resultar gravemente afectadas y podrían constituir anfitriones que propagaran el virus a media distancia.

Palabras clave
Enfermedades aviares - Influenza aviar altamente patógena - Influenza aviar levemente patógena - Patobiología - Patogénesis - Patotipos - Virus de la influenza aviar.

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RESEARCH ARTICLE

A novel twelve class fluctuation test reveals higher than expected mutation rates for influenza A viruses

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Abstract Influenza virus' low replicative fidelity contributes to its capacity for rapid evolution. Clonal sequencing and fluctuation tests have suggested that the influenza virus mutation rate is 2.7 $\times$ 10^{-6} - 3.0 $\times$ 10^{-5} substitutions per nucleotide per strand copied (s/n/r). However, sequencing assays are biased toward mutations with minimal fitness impacts and fluctuation tests typically investigate only a subset of all possible single nucleotide mutations. We developed a fluctuation test based on reversion to fluorescence in a set of virally encoded mutant green fluorescent proteins, which allowed us to measure the rates of selectively neutral mutations representative of the twelve different mutation types. We measured an overall mutation rate of 1.8 $\times$ 10^{-4} s/n/r for PR8 (H1N1) and 2.5 $\times$ 10^{-4} s/n/r for Hong Kong 2014 (H3N2) and a transitional bias of 2.7–3.6. Our data suggest that each replicated genome will have an average of 2–3 mutations and highlight the importance of mutational load in influenza virus evolution.
DOI: 10.7554/eLife.26437.001

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Competing interests: The authors declare that no competing interests exist.

Funding: See page 15

Received: 01 March 2017
Accepted: 09 June 2017
Published: 09 June 2017

Reviewing editor: Karla Kirkegaard, Stanford University School of Medicine, United States

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Introduction

The rapid evolution of influenza virus has led to reduced vaccine efficacy, widespread drug resistance, and the annual emergence of novel strains. While complex ecological, environmental, and host demographic factors influence the evolutionary dynamics of influenza virus, the virus' adaptability is driven in large part by its capacity to generate genetic diversity through mutation and reassortment (***Nelson and Holmes, 2007***). Like other RNA viruses, influenza virus replicates with extremely low fidelity. The influenza virus RNA-dependent RNA polymerase (RdRp) complex, which includes the viral proteins PB1, PB2, PA, and NP, lacks proofreading and repair activity (***Te Velthuis and Fodor, 2016***). Its mutation rate has been reported to be approximately 10^{-5} to 10^{-6} mutations per nucleotide per cellular infection (***Sanjuán et al., 2010***; ***Suárez-López and Ortín, 1994***; ***Suárez et al., 1992***; ***Nobusawa and Sato, 2006***; ***Parvin et al., 1986***; ***Bloom, 2014***).

An accurate accounting of influenza virus' mutation rate and mutational bias is essential for defining its evolutionary dynamics and for informing control efforts. The mutation rate will determine the probability that a mutation conferring drug resistance, antibody escape, or broadened host range will be generated within a given virus population. It will also define a virus' sensitivity to drug-induced lethal mutagenesis, a broad-spectrum antiviral strategy that exploits the high mutation rate and low mutational tolerance of many RNA viruses (***Anderson et al., 2004***; ***Bull et al., 2007***). We have shown that the antiviral activity of three different nucleoside analogues is due to increased viral mutation rates, and a new anti-influenza drug, favipiravir, has been found to act through a similar mechanism (***Cheung et al., 2014***; ***Pauly and Lauring, 2015***; ***Baranovich et al., 2013***). As in other RNA viruses, the mutational bias of the influenza polymerase complex is largely undefined. While viral mutation rates are typically reported as a single measurement, each of the 12 distinct

nucleotide substitutions (for example, A to C, G to U) will have its own rate. The rates of these mutational classes will in turn determine the accessibility of various nucleotide and amino acid substitutions. Many RNA viruses appear to exhibit a pronounced bias toward transition mutations (**Sanjuán et al., 2010**). Because transitions are more likely to be synonymous than transversions, this bias can impact models of molecular evolution and inferences of natural selection based on dN/dS ratios.

Mutations are typically reported as either frequencies or rates (**Sanjuán et al., 2010**; **Belshaw et al., 2011**). Mutation frequency is the number of mutations identified in a sample per nucleotide sequenced. Frequency measurements therefore quantify not only the rate at which a mutation is generated but also that mutation's ability to persist in a population. In contrast, mutation rates measure how many mutations are made in a discrete unit of time (for example, per infection cycle or strand copied) and are a better representation of polymerase error. Viral mutation rates have often been measured by Sanger sequencing of randomly selected clones obtained through plaque purification or limiting dilutions (**Tromas and Elena, 2010**; **Vignuzzi et al., 2006**; **Eckerle et al., 2007**; **Nobusawa and Sato, 2006**; **Parvin et al., 1986**; **Bloom, 2014**). Mutation frequencies obtained in this manner can be converted to mutation rates by adjusting for the number of replication cycles prior to sampling (**Sanjuán et al., 2010**). With these adjustments, sequencing-based estimates of influenza virus mutation rates range from 7.1×10^{-6} to 4.5×10^{-5} substitutions per nucleotide per cell infection cycle. While sequencing approaches can potentially measure the rate of all mutational classes, they lack precision and have poor power for detecting differences across strains or conditions. They are also biased towards sampling of genomes with higher fitness. Next generation sequencing platforms have increased the throughput and power of clonal sequencing, but in many cases, the impact of reverse transcription error in library preparation has not been thoroughly investigated.

A more direct way to measure mutation rates is to use a Luria-Delbrück fluctuation test (**Luria and Delbrück, 1943**; **Koziol, 1991**; **Foster, 2006**; **Furió et al., 2005**; **Combe and Sanjuán, 2014**). In this method, a large number of parallel cultures are infected with small inocula and assessed for a set of newly generated mutants exhibiting a scoreable phenotype after a period of exponential growth. Because the mutations are rare and random, they follow a Poisson distribution across cultures. Mutation rate estimates from a null class model are robust to the mode of replication, which may vary across viral species (**Foster, 2006**; **Furió et al., 2005**). Using resistance to monoclonal antibodies as a scoreable phenotype, influenza's mutation rate has been estimated to be 2.7×10^{-6} to 3.0×10^{-5} substitutions per nucleotide per strand copied (**Suárez et al., 1992**; **Suárez-López and Ortín, 1994**). While fluctuation tests are more precise than sequencing assays, most scoreable phenotypes sample just a few sites or mutational classes.

Here, we apply two new approaches for measuring the influenza virus mutation rate that overcome the drawbacks of sampling bias and low statistical power inherent to currently available methods. The first relies on measurements of the frequency of mutations to stop codons within a short segment of the influenza genome using PrimerID, an error-controlled next-generation sequencing approach (**Jabara et al., 2011**; **Zhou et al., 2015**). Because these nonsense mutations are lethal and generally not propagated, their frequencies approximate the mutation rate in the prior replication cycle (**Cuevas et al., 2009**). The second is a Luria-Delbrück fluctuation test that scores reversion to fluorescence in virally encoded green fluorescent protein (GFP) mutants (**Zhang et al., 2013**). The GFP method enabled interrogation of all 12 mutation classes independently and under distinct replication conditions.

Results

The vast majority of premature stop codons in RNA virus open reading frames are lethal and are therefore likely to have been generated during the previous replication cycle (for example, [**Visher et al., 2016**]). Eighteen of the 61 sense codons are a single mutation away from a stop codon, and the frequency at which these nonsense mutational targets (NSMT) mutate to stop codons approximates the viral mutation rate. When combined with a highly accurate next generation sequencing approach, the NSMT method can provide rate estimates for eight mutational classes (**Cuevas et al., 2009**; **Cuevas et al., 2015**; **Acevedo et al., 2014**). We identified a 402 base fragment within the PA gene of A/Wisconsin/03/2007 H3N2 that contains a balanced distribution of 80

NSMT, and used the PrimerID method to sequence individual PA clones from an influenza population on the Illumina platform. PrimerID sequencing utilizes a library of barcoded reverse transcription primers to generate consensus sequences for each cDNA template, thereby controlling for the PCR or base-calling errors that plague many next generation sequencing studies (**Jabara et al., 2011**; **Zhou et al., 2015**). The PrimerID method does not control for errors introduced during reverse transcription (RT), and the mutation rates of reverse transcriptases are similar to those of viral RNA dependent RNA polymerases (RdRp) (**Sanjuán et al., 2010**).

In an attempt to distinguish RT errors from mutations introduced by the influenza RdRp, we compared PrimerID-NSMT estimates of the mutation rate for influenza virus to a control, in which the segment 3 (PA) RNA was expressed from a plasmid pol I promoter in transfected cells (**Hoffmann et al., 2000**). Mutations identified in the viral genome are derived from either the influenza RdRp or RT, and the control establishes the background error rate of the assay due to pol I transcription and RT (**Figure 1A**). We obtained over 449,000 aligned PA fragment consensus sequences for each sample, representing approximately 75% of starting RNA templates. The frequencies of mutations to stop codons were similar for 5 of the 8 mutation classes (**Figure 1B**, **Supplementary file 1**). The frequencies of the other three mutation classes (A to U, C to A, and U to G) were only slightly higher in the samples derived from RNA replicated by the influenza RdRp than those that were not. The G to A mutation rate was highest in both samples (1.3×10^{-4} and 8.5×10^{-5} substitutions per nucleotide for cell-derived and viral-derived samples, respectively), and analyses of the RT mutational spectrum consistently show this to be the most common mutation, with rates of 1×10^{-4} substitutions per nucleotide (**Gout et al., 2013**; **Mansky and Temin, 1995**; **Holtz and Mansky, 2013**; **Cuevas et al., 2015**). These data demonstrate that the background error rate of reverse transcriptase during sample preparation is equal to or higher than the rate of mutations introduced by the influenza RdRp.

We also compared the frequency of mutations to stop codons to the frequency of all observed mutations. Mutations in the transfected control were evenly distributed across the PA fragment and no more common than the subset of mutations to stop codons (**Figure 1C**). In contrast, the frequency of mutations in the replicated viral RNA was higher than the subset of stop codon mutations. The accumulation of mutations to frequencies above those of the stop codon mutations and the background signal indicate the action of selection on newly generated mutations. Together, these data suggest that the high background error rate of reverse transcriptase and issues of selection bias may confound sequencing-based measurements of the basal mutation rate and mutational bias of riboviruses.

A fluorescence-based fluctuation test

We developed a Luria-Delbrück fluctuation test for influenza virus mutation rates that scores reversion to fluorescence in a set of 12 virally-encoded mutant green fluorescent proteins (GFP). The fluorescent chromophore of enhanced GFP contains three essential amino acids (T65, Y66, and G67) (**Ma et al., 2010**), and nonsynonymous substitution at any of these positions results in a GFP with either absent or altered fluorescent properties (**Timerghazin et al., 2008**; **Fu et al., 2015**; **Nakano et al., 2002**). We used a plasmid that contains GFP instead of hemagglutinin on influenza A virus segment 4 (ΔHA-GFP, [**Martínez-Sobrido et al., 2010**]), to generate a set of 12 derivatives that each encode a mutant GFP protein (**Table 1**). Each of these mutant GFP proteins has a single nucleotide mutation that, with reversion to fluorescence, will interrogate a specific mutational class introduced by the viral RdRp during viral replication. Influenza viruses expressing these mutant GFP proteins from a genomic context were rescued from cells co-transfected with each construct as well as 7 additional plasmids that express the remaining 7 genomic segments and the viral proteins encoded by each. Because these ΔHA-GFP viruses express GFP rather than HA, they were replicated in cells stably expressing the HA protein in trans. They were then transferred to a second plate of non-HA expressing cells for imaging.

Because our mutant GFP proteins are not fluorescent, we used anti-GFP antibody staining and immunofluorescence microscopy to verify GFP expression from each of the 12 mutant ΔHA-GFP viruses. In virally infected cultures, we occasionally identified rare cells expressing GFP that was fluorescent at the excitation and emission wavelengths consistent with reversion to fluorescence (**Figure 2A**). We used antibody staining to titrate the total number of viruses expressing GFP. The growth kinetics of mutant ΔHA-GFP A/Puerto Rico/8/1934 H1N1 viruses were slower than the

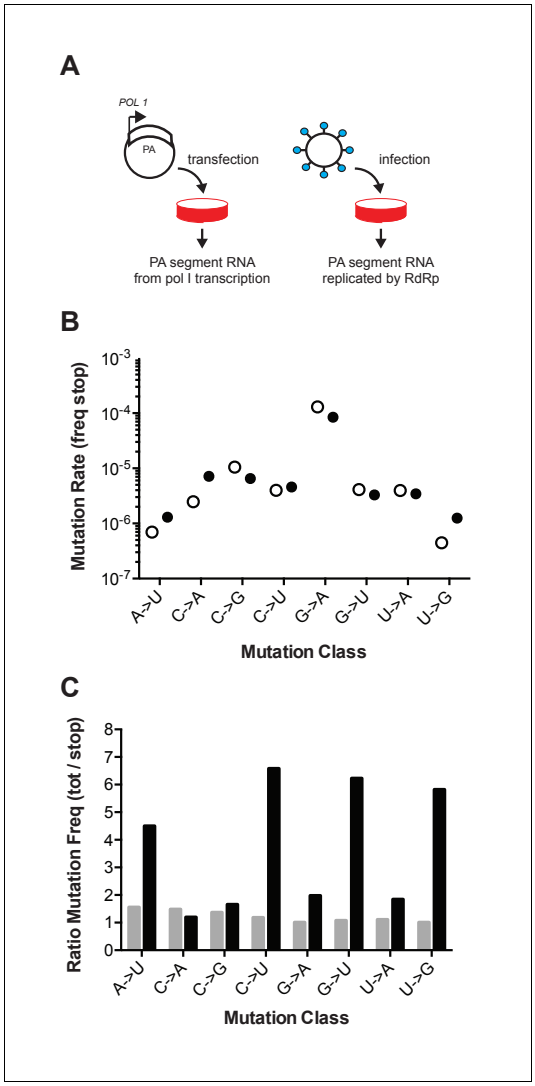

Figure 1. Influenza mutation rates by PrimerID next generation sequencing. (**A**) Segment 3 (PA) RNA was isolated from either cells transfected with pol I expression plasmids or cell-free supernatants of cells infected with influenza virus. These RNA were reverse transcribed with barcoded PrimerID primers and amplified by PCR for sequencing as described in the methods. We obtained 449,655 PrimerID consensus sequences for the plasmid-derived RNA sample and 481,286 consensus sequences for the virus-derived RNA sample. (**B**) The frequencies of mutations to stop codons in pol I transcribed RNA (open circles) and virus-derived RNA (filled circles) were determined by dividing the number of stop codon mutations across the consensus sequences by the total number of nonsense mutation target (NSMT) sites analyzed. Plotted data are in ***Figure 1—source data 1***. See also ***Supplementary file 1***. (**C**) Total mutation frequencies were calculated as the number of observed mutations for a particular mutation class divided by the number of sequenced sites that could mutate by that same class. Shown is the ratio of total mutation frequency to stop

Figure 1 continued on next page

parental PR8, but similar among the 12 mutants (***Figure 2B***). In all cases, titers of 1×10^5 per milliliter were achieved by 22 hr at 37°C. This corresponds to 10^4 viruses per well of a 96 well plate, which is the maximum that can be accurately measured by fluorescence microscopy. In subsequent experiments, we used antibody staining of infected cells to titrate the total number of viruses expressing GFP – the mutational target – since a subset of viruses will delete the GFP open reading frame during replication.

Fluctuation tests are most accurate when the marker is selectively neutral (***Foster, 2006***; ***Furió et al., 2005***). We measured the replicative fitness of viruses expressing the mutant ΔHA-GFP relative to those expressing the wild type ΔHA-GFP. We competed a subset of the mutant viruses against a wild type ΔHA-GFP virus containing a neutral PB1 sequence barcode and used RT-quantitative PCR to measure the frequency of the competitors over serial passage on MDCK-HA cells (***Visher et al., 2016***). Each of 6 mutant ΔHA-GFP viruses, which sample mutations in the 3 mutated amino acid positions, maintained stable frequencies over 4 passages. They were just as fit as the wild type ΔHA-GFP virus (***Figure 2B***, $p>0.05$, n = 3 replicates, one way ANOVA), confirming that the scoreable phenotype and the mutations interrogated are selectively neutral.

The secondary structure of genomic RNA in positive sense viruses is known to influence mutation rates in a site specific manner (***Geller et al., 2015***, ***2016***; ***Pathak and Temin, 1992***; ***Pita et al., 2007***). In influenza virus, the formation of stable RNA structures in the replication complex is limited by the binding activity of the viral nucleoprotein (***Te Velthuis and Fodor, 2016***). We performed an in silico analysis of the ΔHA-GFP RNA to further exclude the possibility that reversion of mutations could be influenced by local RNA structure (***Figure 2D***). A sliding window analysis of the minimum free energy of RNA folding suggests that the introduced mutations are not located in highly stable RNA secondary structures in the ΔHA-GFP RNA (***Lorenz et al., 2011***; ***Jorge et al., 2015***). The rates at which these mutations revert to the wild type sequences are therefore likely to be representative of mutation rates across the influenza virus genome.

We used a Luria-Delbrück fluctuation test to convert reversion frequencies to viral mutation rates (***Luria and Delbrück, 1943***; ***Foster, 2006***). For each of the 12 mutant ΔHA-GFP, we infected parallel cultures of MDCK-HA cells with mutant ΔHA-GFP viruses and transferred replicated virus to MDCK cells in a 96-well imaging plate

Figure 1 continued

codon mutation frequency by mutation class for sequences derived from plasmid-derived RNA (grey bars) and virus-derived RNA (black bars). Plotted data are in ***Figure 1—source data 2***.

DOI: 10.7554/eLife.26437.002

The following source data is available for figure 1:

Source data 1. Spreadsheet with frequencies of mutations to stop codons in plasmid- and virus-derived RNA.

DOI: 10.7554/eLife.26437.003

Source data 2. Spreadsheet with mutation frequency by class for plasmid- and virus-derived RNA.

DOI: 10.7554/eLife.26437.004

(***Figure 3A***). The replication time and transfer volume were empirically determined for each mutation class, drug, temperature, and virus tested to yield approximately 10^4 infectious viruses in the transfer population. Because the ΔHA-GFP viruses do not express the HA protein, they only replicate in MDCK-HA cells, and there was no viral spread in the imaging plate. The kinetics and intensity of GFP expression are driven by the ability of the replicated viruses to infect cells on the imaging plate, replicate their RNA and express GFP protein. Expression is independent of whether a given genome coding for a green GFP was generated early or late in the replication plate. We used a null class model to calculate mutation rates based on the number of parallel cultures without a revertant in the imaging plate (green fluorescence) and the degree of viral replication (anti-GFP antibody staining of the inocula and replicated virus). Importantly, the null class model relies on the number of cultures with any revertant virus, as opposed to the absolute number of revertant viruses. Because the actual number of infectious cycles is irrelevant to the calculation of mutation rates, the null class model further removes any bias attributable to mutations generated early or late in the replication plate. The mutation rates we report using this method are in the coding (+) sense of the RNA, rather than the genomic (-) sense.

We validated the specificity of our assay for specific mutational classes by performing a set of fluctuation tests in each of three different mutagenic nucleoside drugs. We and others have previously shown that ribavirin increases the frequency C to U and G to A transitions, 5-azacytidine increases the frequency of C to G and G to C transversions, and 5-fluorouracil increases the frequency of all transitions (A to G, C to U, G to A, and U to C) in influenza virus (***Pauly and Lauring, 2015***; ***Cheung et al., 2014***). Each of these mutagens increased the rates of only the expected mutation classes (***Figure 3B–D***). In some cases, the amount of replicated virus was sufficiently low and the

Table 1. Non-fluorescent ΔHA-GFP constructs.

Mutation Probed*	Nucleotide Sequece†	Amino acid Sequence‡
WT eGFP	acc uac ggc	T Y G
A -> C	a***Aa*** uac ggc	***K*** Y G
A -> G	acc uac g***A***c	T Y ***D***
A -> U	acc ***A***ac ggc	T ***N*** G
C -> A	acc u***C***c ggc	T ***S*** G
C -> G	acc uac g***C***c	T Y ***A***
C -> U	acc ***C***ac ggc	T ***H*** G
G -> A	acc u***G***c ggc	T ***C*** G
G -> C	***uGg*** uac ggc§	***W*** Y G
G -> U	acc ***G***ac ggc	T ***D*** G
U -> A	acc u***U***c ggc	T ***F*** G
U -> C	a***Ua*** uac ggc	***I*** Y G
U -> G	acc uac g***U***c	T Y ***V***

*Mutations are in the mRNA coding sense.

†Nucleotides 193–201 of the eGFP reading frame are shown. Changes from wild type are in bold and italics. Site that allows reversion to fluorescence is capitalized.

‡Amino acids 65–67 of eGFP are shown. Changes from wild type are in bold and italics.

§This construct is able to revert to wild type GFP (S65).

DOI: 10.7554/eLife.26437.005

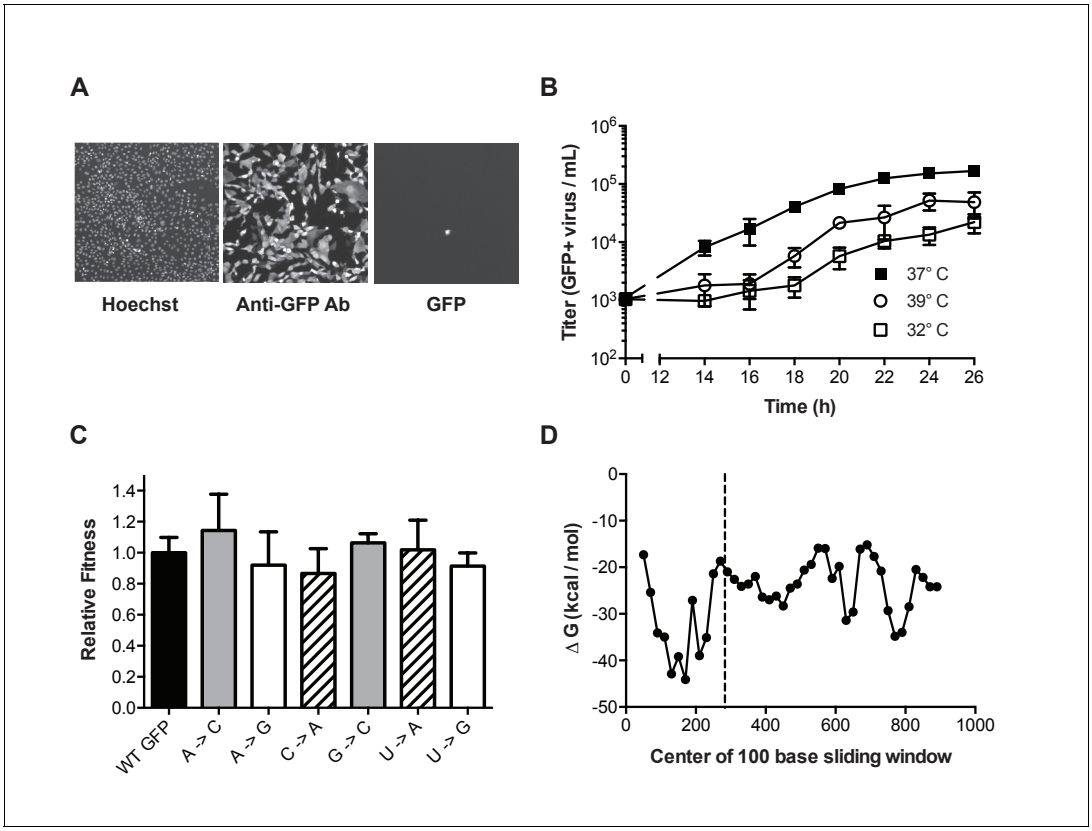

Figure 2. Characterization of mutant ΔHA-GFP influenza viruses. (**A**) Fluorescent images of cells infected with mutant ΔHA-GFP (shown are data for the A to C virus, see ***Table 1***) and stained with Hoechst and anti-GFP Alexa 647 conjugate. Cells were imaged at 4x magnification and the resulting images were digitally magnified to an equal extent for this figure. (**B**) Growth kinetics of mutant ΔHA-GFP viruses. MDCK-HA cells were infected at an MOI of 0.01 in 96-well plates and incubated at 32˚C (open squares), 37˚C (filled squares), or 39˚C (open circles). At each time point, the supernatants from 4 wells were transferred to a new 96-well plate containing MDCK cells. After 14 hr the cells were fixed and stained using an anti-GFP antibody. The number of cells stained were determined by fluorescence microscopy and used to calculate the titer of GFP expressing virus. Data shown are the cumulative mean and standard deviations for 4 measurements at each time point for each of two mutant ΔHA-GFP viruses (C to U and U to A viruses). Each point is the therefore the mean ± standard deviation for 8 values. Plotted data are in ***Figure 2—source data 1***. (**C**) The fitness of 6 of the mutant ΔHA-GFP viruses (x-axis) were compared to wild type ΔHA-GFP through direct competition with a genetically barcoded competitor over 4 serial passages. Quantitative PCR was used to determine the relative changes in the frequency of the two competitors and fitness values were calculated as described in the Methods. Mutant viruses are classified by the GFP amino acid mutated, with wild type (black), T65 (gray), Y66 (striped), G67 (white). Shown are the mean and standard deviation for three competitions and fitness measurements for each virus. Plotted data are in ***Figure 2—source data 2***. (**D**) The minimum free energy of RNA folding for 100 base sliding windows (80 base overlaps) were determined for the ΔHA-GFP construct. The location of the three mutated sites (bases 280–288) are indicated by the dashed line. Plotted data are in ***Figure 2—source data 3***.

DOI: 10.7554/eLife.26437.006

The following source data is available for figure 2:

Source data 1. Spreadsheet with virus titer (GFP+ virus per ml) in imaging plate at the indicated time points and temperatures.

DOI: 10.7554/eLife.26437.007

Source data 2. Spreadsheet with replicate fitness values for wild type and ΔHA-GFP viruses as shown in ***Figure 2C***.

DOI: 10.7554/eLife.26437.008

Source data 3. Spreadsheet with minimum free energy of RNA folding by window start position as shown in ***Figure 2D***.

DOI: 10.7554/eLife.26437.009

mutations were sufficiently rare that we were not able to obtain replicate fluctuation tests in which the null class (P_0) lay within the ideal range of 0.1–0.7 (***Koziol, 1991***; ***Foster, 2006***). Here and elsewhere, these less precise mutation rate measurements are indicated with open symbols (***Figures 3–5***).

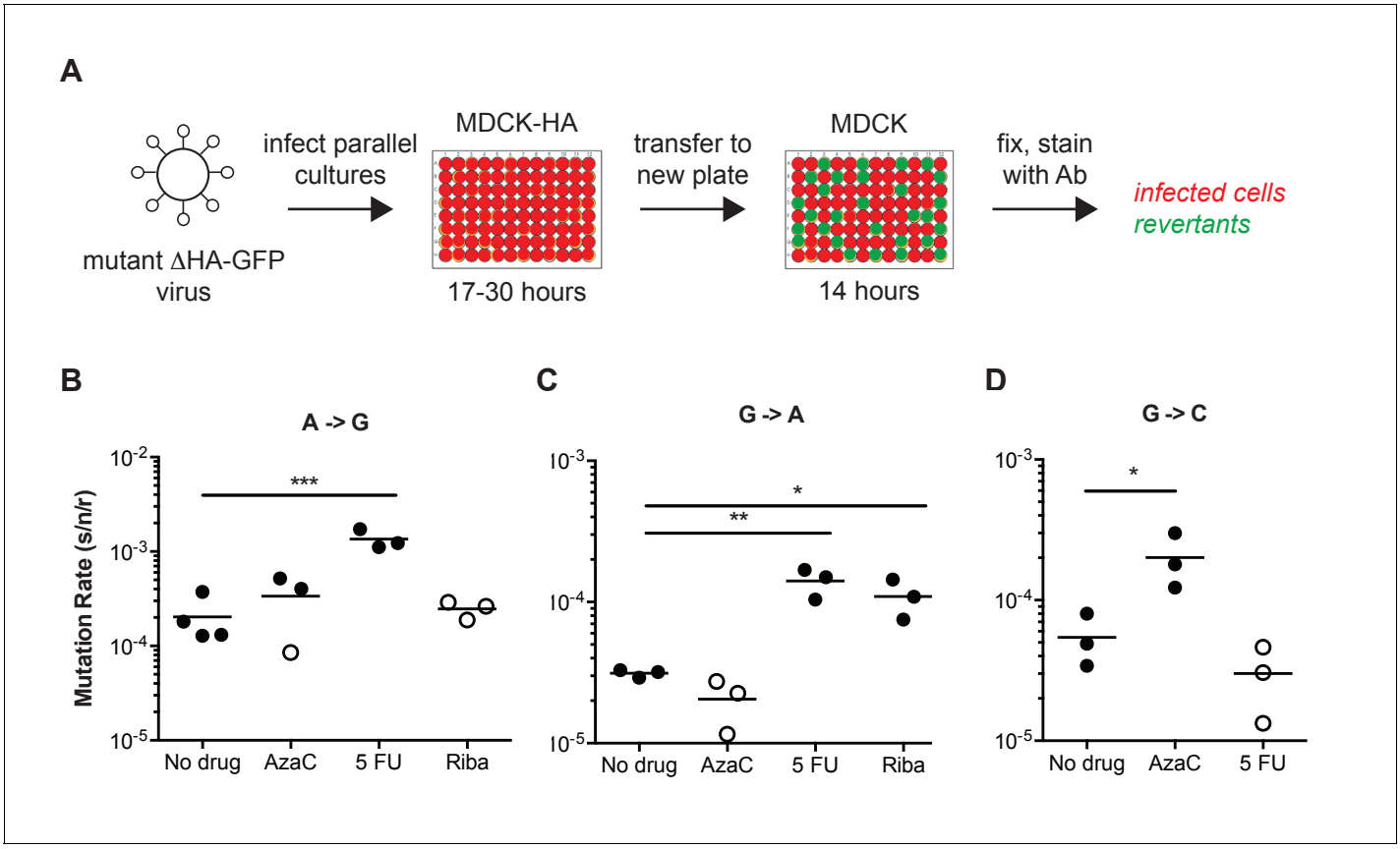

Figure 3. Fluorescent Luria-Delbruck fluctuation test. (**A**) General workflow for measuring the mutation rate using mutant ΔHA-GFP viruses. Parallel cultures of MDCK-HA cells were infected with passage one stocks of mutant ΔHA-GFP viruses at low multiplicity. The time for initial replication was varied to allow for a number of replicated viruses and revertants adequate to measure the mutation rate for a given class. Supernatants were transferred to 96-well plates of MDCK cells and incubated for 14 hr to allow for infection and GFP expression in target cells. The mutation rate for each mutant ΔHA-GFP virus and class was calculated as described in the methods and text based on the initial and final titer (N_i and N_f, anti-GFP positive infected cells) and proportion of cultures with no revertants (P_0, wells without green fluorescence). (**B–D**) Specificity of the reversion to fluorescence assay. The (**B**) A to G, (**C**) G to A, and (**D**) G to C mutation rates for A/Puerto Rico/8/1934 H1N1 were measured at 37˚C in cells pretreated with 0.625 μM 5-azacytidine (AzaC), 15 μM 5-fluorouracil (5 FU), or 2.5 μM ribavirin (Riba). No data are shown for G to C with 2.5 μM ribavirin because large titer decreases upon drug treatment prohibited measurements. Filled symbols represent measurements in which P0 is between 0.1 and 0.69, where the assay is most precise. Open circles represent data with P0 between 0.7 and 0.9. Arithmetic means are indicated. A one-way ANOVA with a Dunnett's correction for multiple comparisons was used for each mutation class to compare each drug treatment to no drug treatment. *p<0.05, **p<0.01, ***p<0.005. Plotted data are in ***Figure 3—source data 1***.

DOI: 10.7554/eLife.26437.010

The following source data is available for figure 3:

Source data 1. Mutation rates for A to G, G to A, and G to C viruses in the presence and absence of AzaC, 5FU and Riba as measured by fluctuation test.

DOI: 10.7554/eLife.26437.011

The mutation rates of influenza A virus

We used our GFP fluctuation test to measure the mutation rates of two evolutionarily divergent influenza viruses. Influenza A/Puerto Rico/8/1934 H1N1 (PR8) was the second influenza virus isolated and was extensively passaged in various cell culture environments prior to cloning (***Francis and Magill, 1935***). We cloned a circulating seasonal influenza virus, influenza A/Hong Kong/4801/2014 H3N2 (Hong Kong 2014), into the 8 plasmid reverse genetic system after limited passage in MDCK. After transfection, the rescued PR8 virus contained the ΔHA-GFP segment with seven PR8 genome segments. The rescued Hong Kong 2014 virus contained the ΔHA-GFP segment, the segments coding for the polymerase complex – PB2, PB1, PA, and NP – from A/Hong Kong/4801/2014 H3N2, and the segments encoding NA, M, and NS from PR8. This chimera was necessary to obtain high titer stocks.

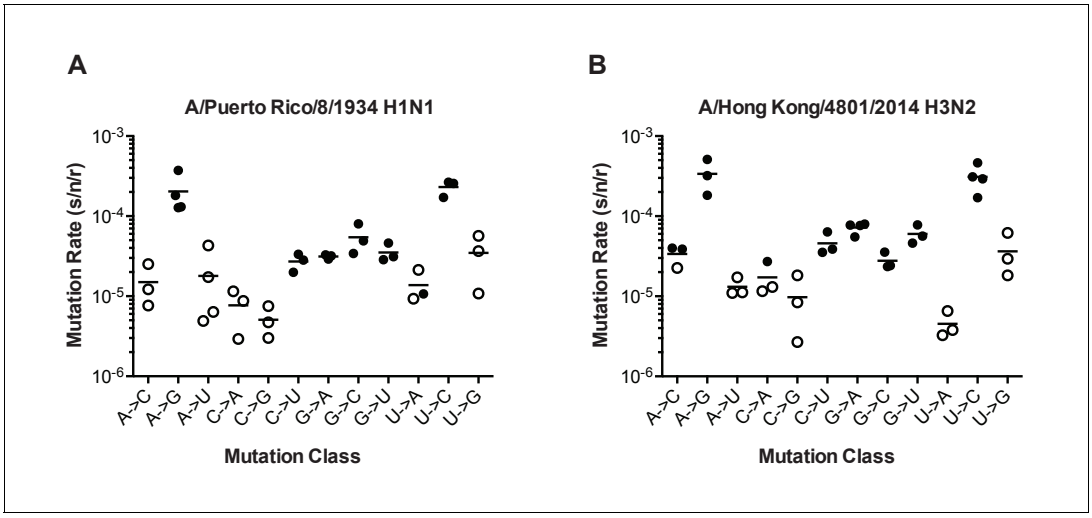

Figure 4. The mutation rates of influenza viruses replicated at 37°C. (**A**) Measurements of A/Puerto Rico/8/1934 H1N1 viruses encoding the 12 different mutant ΔHA-GFP constructs. (**B**) Measurements of viruses encoding the replication complex (PB2, PB1, PA, and NP) from A/Hong Kong/4801/2014 H3N2 and the remaining genes coming from A/Puerto Rico/8/1934 H1N1. Filled symbols represent measurements in which P0 is between 0.1 and 0.69. Open circles represent data with P0 between 0.7 and 0.95. Plotted data are in ***Figure 4—source data 1***. Raw counts of green cells in positive wells for Hong Kong viruses are in ***Figure 4—source data 2***. The arithmetic means are indicated on the graphs and the means and standard deviations reported in ***Supplementary file 2***.

DOI: 10.7554/eLife.26437.012

The following source data is available for figure 4:

Source data 1. Mutation rates for all twelve mutational classes for PR8 and Hong Kong viruses as measured by fluctuation test.

DOI: 10.7554/eLife.26437.013

Source data 2. Raw data for all experiments with Hong Kong viruses showing number of wells with n green cells (n = 0–10).

DOI: 10.7554/eLife.26437.014

The mutation rates of the PR8 and Hong Kong 2014 viruses were higher than previously reported for influenza A virus and generally biased toward transitions (***Parvin et al., 1986***; ***Nobusawa and Sato, 2006***; ***Bloom, 2014***). In both viruses, mutation rates were highest for the reciprocal transitions, A to G and U to C (***Figure 4*** and ***Supplementary file 2***). The rates for the other two transitions (C to U and G to A) were approximately six fold lower and similar to the rates of the more common transversion mutations. We note that this G to A mutation rate is much lower than the rate estimated using the PrimerID-NSMT assay (see ***Figure 1***). This discrepancy may reflect differences in mutational bias between the influenza RdRp and retroviral reverse transcriptases. The overall rate and spectrum of mutations for the PR8 and Hong Kong 2014 viruses are very similar, and given the base composition of each virus, we estimate that each replicated 13.5 kb genome contains, on average, 2 to 3 mutations. The transition to transversion ratio is 2.7 in PR8 and 3.6 in Hong Kong 2014.

We did identify differences between the two viruses in specific mutation classes. The rate of G to A mutations was two-fold higher in Hong Kong 2014 than in PR8 (7.2×10^{-5} vs. 3.1×10^{-5}, p=0.0018, multiple t-test with Holm-Sidak correction), and the Hong Kong 2014 virus also exhibited a marginally increased rate of G to U mutations that was not statistically significant (6.0×10^{-5} vs. 3.5×10^{-5}, p=0.083). For both viruses, the rates of mutations away from A are symmetrical to the reciprocal mutations away from U. Interestingly, mutations away from C were much less common than the reciprocal mutations away from G. In PR8 G nucleotides are 3.8 times more likely to mutate than C nucleotides. In the Hong Kong virus, this difference is 2.7 fold.

Influenza virus mutation rates across physiologic temperatures

Biochemical studies of purified influenza virus RdRp suggest that replication temperature can affect enzyme fidelity (***Aggarwal et al., 2010***). Influenza viruses replicate over a range of temperatures in nature from 32°C and 37°C across the respiratory tract of humans to 39°C in febrile illness to 41°C in birds (***Köhl, 1990***; ***McFadden et al., 1985***; ***Scull et al., 2009***; ***Bradel-Tretheway et al., 2008***). We used the PR8 virus encoding mutant ΔHA-GFP representing the 5 most frequent mutational classes

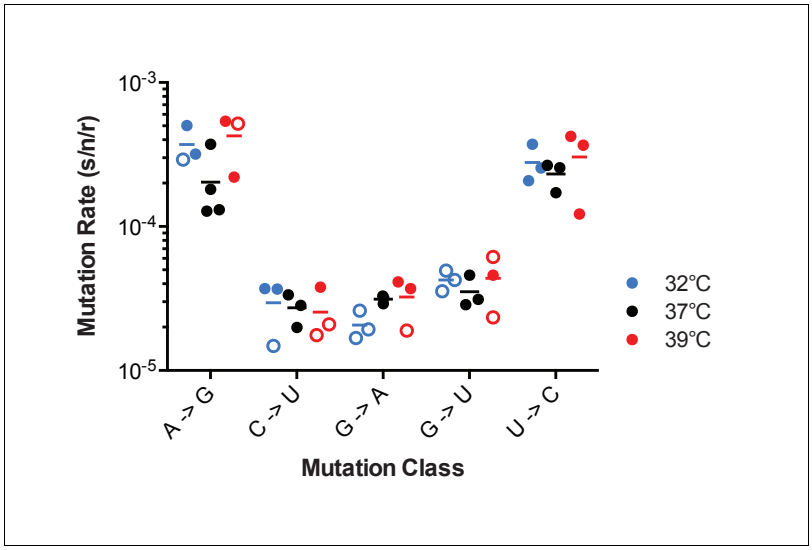

Figure 5. The effect of temperature on influenza A virus mutation rates. Mutation rates were determined for A/Puerto Rico/8/1934 H1N1 viruses encoding the indicated mutant ΔHA-GFP constructs replicated at 32°C (blue), 37°C (black) and 39°C (red). Filled symbols represent measurements in which P0 is between 0.1 and 0.69. Open circles represent data with P0 between 0.7 and 0.90. The arithmetic means are indicated. A two-way ANOVA revealed no significant differences in mutation rates based upon temperature. Plotted data are in ***Figure 5—source data 1***.

DOI: 10.7554/eLife.26437.015

The following source data is available for figure 5:

Source data 1. Mutation rates for all twelve mutational classes for PR8 at the indicated temperatures as measured by fluctuation test.

DOI: 10.7554/eLife.26437.016

to measure mutation rates at different temperatures. This virus replicated reasonably well in MDCK-HA cells at 32°C and 39°C, albeit to lower titers (see ***Figure 2C***). The mutation rates for these 5 classes were generally stable over this 7 degree range of physiological temperatures (***Figure 5***). We were unable to measure mutation rates at temperatures higher than 39°C due to host cell intolerance.

Discussion

We developed two new methods to define the mutation rate and mutational bias of H1N1 and H3N2 influenza viruses. We found that the background error rate of reverse transcriptase may confound measurements of influenza virus mutation rates that are based on sequencing of RT-PCR amplified templates. We therefore developed a high throughput GFP-based assay to estimate the mutation rates for all 12 substitution classes. This assay can be easily adapted to any virus that tolerates the addition of the GFP open reading frame. While PR8 (H1N1) and Hong Kong 2014 (H3N2) viruses varied in their mutation rates for individual classes, the overall mutation rate was consistent across these evolutionarily divergent influenza polymerases at a range of temperatures. These mutation rates are considerably higher than previously reported, and given the impact of mutational load, suggest that the virus is replicating at the maximally tolerable mutation rates.

Sequencing assays for viral mutation rates are plagued by ascertainment and sampling biases. The mutations that are detected in plaque-derived populations represent only the viable fraction and those identified in passaged supernatants are often heavily biased toward mutations with less deleterious fitness effects. While Sanjuan and colleagues have appropriately adjusted for typical viral mutational fitness effects in sequence-based estimates of mutation rates (***Sanjuán et al., 2010***), these fitness effects may not be uniform across viruses or in the genes analyzed (***Sanjuán, 2010***; ***Visher et al., 2016***). Next generation sequencing can minimize these biases by improving the detection of rarer, more deleterious mutations (***Geller et al., 2016***, ***2015***; ***Cuevas et al., 2015***;

Combe et al., 2015). However, our data from PrimerID-controlled next generation sequencing suggest that reverse transcriptase error can be a significant confounder that needs to be considered in studies of RNA viruses. In our experiments, the high background RT error rate made it difficult to distinguish mutations introduced by the influenza polymerase complex from those generated during reverse transcription of the viral genomic RNA. The mutational bias of RT may also differ from that of viral RNA-dependent RNA polymerases. Guanine to adenine transitions are the most common mutation made by RT (*Gout et al., 2013*; *Mansky and Temin, 1995*; *Holtz and Mansky, 2013*; *Cuevas et al., 2015*) and are the ones found most frequently in our study as well as many others that rely on RT-PCR amplification for sequencing (for example, [*Crotty et al., 2000*; *Pauly and Lauring, 2015*; *Cheung et al., 2014*; *Presloid et al., 2016*]). In contrast, our fluctuation test suggests that A to G and U to C mutations are the most common classes in influenza.

Fluctuation tests are sensitive for rare mutational events and avoid many of the issues with sequencing assays (*Luria and Delbrück, 1943*; *Foster, 2006*; *Furió et al., 2005*; *Combe and Sanjuán, 2014*). Our reversion to fluorescence assay has several additional advantages over ones that rely on phenotypic markers such as drug or antibody resistance (*Zhang et al., 2013*). First, the marker was selectively neutral, as the mutant GFP and revertant wild type GFP viruses had equal fitness. Second, we were able to measure all 12 mutational classes in a format that allowed for sufficient replicates. Third, we were able to control the number of cellular infection cycles by expressing the HA protein in trans (*Martínez-Sobrido et al., 2010*). Fourth, we used an anti-GFP antibody to measure the number of mutation targets directly. One shortcoming of all fluctuation tests is that genomic mutation rates are extrapolated from data at one specific site. While RNA structures are unlikely to play a major role in mutation rate variability in influenza virus (*Te Velthuis and Fodor, 2016*), we cannot exclude that sequence context could modulate mutation rates across the genome. For example, influenza and other RNA viruses can exhibit bias in their dinucleotide content (*Belalov and Lukashev, 2013*; *Greenbaum et al., 2008*), and it is not clear whether the bases preceding a site can influence local nucleotide misincorporation rates.

We found that the mutation rates of the lab adapted PR8 H1N1 strain are similar to those of a recently circulating H3N2 strain, and both sets of measurements are considerably higher than those obtained in previous sequence-based studies. While these earlier works estimated rates between 7.1×10^{-6} and 4.5×10^{-5} mutations per nucleotide per cell infection, our composite mutation rates were 1.8×10^{-4} and 2.5×10^{-4} mutations per nucleotide per strand replicated for PR8 (H1N1) and Hong Kong/2014 (H3N2), respectively (*Parvin et al., 1986*; *Nobusawa and Sato, 2006*; *Bloom, 2014*; *Sanjuán et al., 2010*). Consistent with the biases detailed above, our measurements are closer to those obtained for specific classes in antibody-based fluctuation tests (*Suárez et al., 1992*; *Suárez-López and Ortín, 1994*). These very high mutation rates mean that each replicated genome has, on average, 2–3 mutations. We have found that 28–31% of randomly selected mutations in influenza virus are lethal (*Visher et al., 2016*). Using a 70% probability that a given mutation results in a viable virus, the likelihood of any given genome being able to replicate is only 34% to 49%. We suggest that mutational load accounts for a sizable portion of the 90–99% of genomes in influenza populations that are non-infectious (for example, [*Baranovich et al., 2013*; *Pauly and Lauring, 2015*]). This mutation rate clearly places influenza close to a theoretical maximum rate, and we and others have shown that small increases in the virus' mutation rate lead to considerable losses in genome infectivity (*Baranovich et al., 2013*; *Cheung et al., 2014*; *Pauly and Lauring, 2015*).

Cellular replication environments are often hypothesized to influence RNA virus mutation rates, and yet these effects have rarely been documented (*Pita and Roossinck, 2013*; *Pita et al., 2007*; *Diamond et al., 2004*; *Holtz and Mansky, 2013*; *Combe and Sanjuán, 2014*). Here, we found no significant differences in rates of the five most common mutational classes across a seven degree range of physiologic temperatures. Nucleotide pools could potentially influence the observed mutational biases. Intracellular concentrations of nucleotide triphosphates are much higher than those of deoxynucleotides, and cellular pools are typically biased towards ATP and GTP, which have other metabolic functions (*Traut, 1994*; *Stridh, 1983*). While it is tempting to speculate that pool bias could lead to the observed asymmetry in mutations away from guanine, this is unlikely to be the case in MDCK cells. The concentrations of all four NTP in MDCK cells are at least ten fold higher than the K_m of the influenza polymerase for each (*Aggarwal et al., 2010*; *Stridh, 1983*; *Zhang et al., 2010*). We can't exclude that biases in pools could play a role in primary cells where NTPs may be more limiting. However, Combe and Sanjuan found that VSV mutation rates were

similar across a range of primary and immortalized cell lines that were cultured under a range of conditions (**Combe and Sanjuán, 2014**). It is also intriguing that A to G and U to C were the most common mutations, as these classes are characteristic of the host enzyme adenosine deaminase acting on RNA (ADAR) (**Samuel, 2011**; **Bass, 2002**; **tenOever et al., 2007**). As ADAR-editing occurs almost exclusively on double stranded RNA, it is not clear that it would contribute to the mutation rates measured on our presumably unstructured GFP messages.

We expect that our data will lead to improved models of influenza evolution. For example, our estimates of the virus' transition to transversion bias can inform null models for inference of selection in protein coding genes. The availability of a complete nucleotide substitution matrix will also enable studies of selection on codon usage and dinucleotide content. The nucleotide frequencies of both PR8 (H1N1) and Hong Kong 2014 (H3N2) are far from what would be predicted by the 12 mutation rates. This suggests either that selection is maintaining the virus' nucleotide content away from the mutational equilibrium or that the virus has not had sufficient time to achieve it. Finally, our measurements for the rate of each mutation class, coupled with recent studies on mutational fitness effects in influenza will also greatly improve our ability to construct more accurate phylogenies.

Materials and methods

Viruses, plasmids, and cells

Madin-Darby canine kidney (MDCK) cells were provided by Arnold S. Monto (University of Michigan School of Public Health) who obtained them directly from the ATCC and Influenza Reagent Resource (Manassas, VA), and HEK 293 T cells were provided by Raul Andino (University of California, San Francisco). Both cell lines were maintained in Dulbecco's modified Eagle medium (Gibco 11965, Waltham, MA) supplemented with 10% fetal bovine serum (Gibco 10437) and 25 mM HEPES (Gibco 15630). Cells were maintained at 37°C and 5% CO_2 in a humidified incubator except where indicated. Laboratory stocks of these cell lines tested negative for mycoplasma contamination in 2013. Neither cell line has been independently authenticated in our lab. We have not used cell lines from the list of commonly misidentified cell lines maintained by the International Cell Line Authentication Committee.

Influenza A/Puerto Rico/8/1934 H1N1 was obtained from the ATCC (VR-1469). The A/Hong Kong/4801/2014 H3N2 strain was obtained from the Centers for Disease Control and Prevention International Reagent Resource (FR-1483). The A/Wisconsin/03/2007 H3N2 strain was provided by Dr. Arnold S. Monto (University of Michigan School of Public Health). Molecular clones were derived from each of these isolates by reverse transcription polymerase chain reaction (RT-PCR) amplification and insertion of all eight genomic segments into the pHW2000 plasmid (**Hoffmann et al., 2001**, **2000**).

Cells expressing the hemagglutinin (HA) protein of influenza A/Puerto Rico/8/1934 H1N1 (MDCK-HA cells) were generated by co-transfection Madin Darby canine kidney (MDCK) cells with pCABSD, which expresses a gene for Blasticidin S resistance, and pCAGGS-HA, which expresses the influenza A/Puerto Rico/8/1934 H1N1 HA (**Martínez-Sobrido et al., 2010**). Pools of cells stably expressing HA were selected in growth media containing 5 µg/mL Blasticidin S. These pools were enriched for cells with high HA expression by staining with an anti-HA antibody (1:1000 dilution, Takara c179, Mountain View, CA) and an Alexa 488-conjugated anti-mouse IgG (1:200 dilution, Life Technologies A11001, Waltham, MA) followed by fluorescence-activated cell sorting on a FACSAria II (BD Biosciences, San Jose, CA). Cells were sorted three times over the course of 5 passages and >99% of cells in the final population were positive for high level HA expression.

A pPOLI vector encoding eGFP with influenza genomic packaging sequences was kindly provided by Luis Martinez-Sobrido (University of Rochester). This construct, which we call ΔHA-GFP, expresses eGFP flanked by the 78 3'-terminal bases (33 noncoding, 45 coding) and 125 5'-terminal bases (80 coding, 45 noncoding) of segment 4 from influenza A/WSN/33 H1N1. It lacks the HA translation initiation codon (**Martínez-Sobrido et al., 2010**). Twelve mutant ΔHA-GFP constructs (**Table 1**) were generated using the QuikChange II site-directed mutagenesis kit (Agilent Technologies 200523, Santa Clara, CA) with primers 5'- CTCGTGACCACCCTG<mutant sequence>GTGCAGTGCTTCAGC-3' and 5'- GCTGAAGCACTGCAC< rev comp mutant sequence>CAGGGTGGTCACGAG-3', where

mutant sequence corresponds to the sequences in **Table 1** and rev comp mutant sequence is the reverse complement of each.

A neutral genetic barcode was incorporated into the PB1 segment of A/Puerto Rico/8/1934 H1N1 in the pHW2000 vector by overlap extension PCR using inner primers 5'-gatcacaactcatttCcaACgGaaACgGAgGgtgagagacaat-3' and 5'-ATTGTCTCTCACCCTCCGTTTCCGTTGGAAATGAG TTGTGATC-3', and outer primers containing BsmB1 sites for cloning into the pHW2000 plasmid.

Recombinant viruses were rescued in 12-well plates after transfection of co-cultures of 2×10^5 293 T cells and 1×10^5 MDCK cells with mixtures of pHW2000 plasmids encoding all 8 influenza genome segments (500 ng each) using 2 µL of TransIT-LT1 (Mirus 2300, Madison, WI) per nanogram of DNA (**Hoffmann et al., 2000**). Viruses expressing GFP were rescued in the same manner except that the pPOLI vector encoding ΔHA-GFP or its mutants and pCAGSS-HA were used in place of the pHW2000 plasmid encoding influenza HA, and MDCK-HA cells were used in place of MDCK cells.

PrimerID sequencing

A custom R script (https://github.com/lauringlab/NGS_mutation_rate_assay) (**Pauly and Lauring, 2017**; copy archived at https://github.com/elifesciences-publications/NGS_mutation_rate_assay) was used to identify the 402 base region in the A/Wisconsin/03/2007 H3N2 genome (positions 865 to 1266 of the PA gene) with the highest concentration of nonsense mutational targets (NSMT). Total cellular RNA was isolated using Trizol (Life Technologies 15596) from 293 T cells 48 hr after transfection with a plasmid expressing A/Wisconsin/03/2007 H3N2 segment 3 (PA). Virus RNA was isolated using Trizol from cell free supernatants of MDCK cells infected with A/Wisconsin/03/2007 H3N2 virus at a multiplicity of infection (MOI) of 0.5 for 24 hr. In both cases, the RNA was treated with DNase I (Roche 04716728001, Indianapolis, IN) to remove residual plasmid DNA. The copy number of segment 3 (PA) RNA in each sample was determined by reverse transcription with SuperScript III (Invitrogen 18080051, Waltham, MA) and primer 5'-AGCAAAAGCAGG-3' followed by quantitative PCR on a 7500 Fast Real-Time PCR system (Applied Biosystems, Waltham, MA) with Power SYBR Green PCR Master Mix (Applied Biosystems 4367659) and primers 5'-TCTCCCATTTGTGTGGTTCA-3' and 5'-TGTGCAGCAATGGACGATTT-3'. A plasmid encoding PA was used to generate a standard curve to relate cycle threshold to copy number. The absence of plasmid DNA containing the PA sequence was confirmed by lack of signal in qPCR of RNA that was not reverse transcribed.

Sequencing libraries were prepared from 2×10^5 copies of segment 3 (PA) RNA using Accuscript high fidelity reverse transcriptase (Agilent Technologies 200820) and primer (5'-CCTACGGGAGGCAGCAGNNNNNNNNNAATTCCTCCTGATGGATGCT-3'), which binds to bases 842 to 861 of the PA gene (positive strand numbering) and contains a degenerate N^{10} barcode sequence (1,048,576 unique sequences). Because the RNA copy number was just one-fifth of the total number of barcode sequences, it is unlikely that the same barcode would prime multiple complementary DNA (cDNA) molecules. Three separate reverse transcription reactions were performed for RNA harvested from both transfected and infected cells to increase the total number of RNA templates in the experiment. The resulting PrimerID barcoded cDNA was purified using Agencourt AMPure XP beads (Beckman Coulter A63881, Indianapolis, IN) to remove residual primers. The purified cDNA was amplified by PCR for 26 cycles (10 s at 98˚C, 30 s at 69˚C, and 30 s at 72˚C) using Phusion high fidelity DNA polymerase (New England Biolabs M0530, Ipswich, MA) and primers 5'-CAAGCAGAAGACGGCATACGAGAT < i7 > AGTCAGTCAGTATGGGGCTACGTCCTCTCCAA-3' and 5'-AATGATACGGCGACCACCGAGATCTACAC < i5 > TATGGTAATTGGCCTACGGGAGGCAGCAG-3', where i5 and i7 are 8 base Illumina indexing sequences. These primers contain the Illumina flow cell adapters at their 5'-ends. Unique index primers were used in the PCR for each of the three RT replicates. Products were gel purified using a GeneJET Gel extraction kit (Thermo Scientific K0691, Waltham, MA) and replicates were pooled with each product at 1.5 ng/µL. The two pooled sets (one for transfected cells and one for infected cells) were each sequenced on an Illumina MiSeq with 2×250 paired end reads, V2 chemistry, and the sequencing primers 5'-TATGGTAATTGGCCTACGGGAGGCAGCAG-3', 5'-AGTCAGTCAGTATGGGGCTACGTCCTCTCCAA-3', and 5'-TTGGAGAGGACG TAGCCCCATACTGACTGACT-3'. Each pooled set, one derived from transfection and one from infection, made up half of the DNA input on a separate sequencing run with the remaining DNA being composed of bacterial genome libraries. This allowed for sufficient sequencing diversity at each base. We obtained over 15 million reads from each of the samples.

Consensus sequences that met empirically determined count cutoffs were generated for each PrimerID using Ruby scripts kindly provided by Ronald Swanstrom and colleagues (University of North Carolina). We obtained greater than 449,000 consensus sequences for each of the two samples, suggesting that nearly 75% of the original RNA templates (6×10^5 copies among 3 separate reactions) were sampled. Consensus sequences were aligned to the A/Wisconsin/03/2007 H3N2 PA sequence using Bowtie2 and analyzed using Samtools. A custom Python script was used to determine the base composition at each position (https://github.com/lauringlab/NGS_mutation_rate_assay) (***Pauly and Lauring, 2017***) and the number of stop codons within each PrimerID consensus sequence. The mutation frequency for each of the eight mutational classes was determined by dividing the number of stop codons resulting from each class by the number of sites sequenced that could possibly mutate to a stop codon through that same class. Raw sequencing fastq files from this experiment are available at the Sequence Read Archive under BioProject accession number PRJNA347826.

Competition assay

Equal quantities ($TCID_{50}$) of selected mutant ΔHA-GFP viruses were mixed with wild type ΔHA-GFP viruses containing a neutral sequence barcode in the PB1 gene, and used to infect 4×10^5 MDCK-HA cells in a 6-well plate at an MOI of 0.01. At 24 hr post infection, supernatants were harvested and infectious particles were titered by $TCID_{50}$. The resulting virus was passaged three more times on MDCK-HA cells, maintaining an MOI of 0.01 at each passage. Each viral competition was performed in triplicate. Viral RNA was harvested from the initial mixture and passaged supernatants using a Purelink Pro 96 viral DNA/RNA kit (Invitrogen 12280). Complementary DNA was synthesized using Superscript III and random hexamers. Quantitative PCR was used to determine the relative amount of total PB1 (primers 5'-CAGAAAGGGGAAGATGGACA-3' and 5'-GTCCACTCGTGTTTGC TGAA-3'), barcoded PB1 (primers 5'-ATTTCCAACGGAAACGGAGGG-3' and 5'-AAACCCCCTTA TTTGCATCC-3'), and non-barcoded PB1 (primers 5'-ATTTCCAACGGAAACGGAGGG-3' and 5'-AAACCCCCTTATTTGCATCC-3') in each sample. The relative amounts of barcoded and non-barcoded PB1 at each passage were normalized by subtracting the Ct threshold for the total PB1 primer set from the respective Ct thresholds (for example, $\Delta Ct = Ct_{competitior} - Ct_{total\ PB1}$). The normalized values at each passage were compared to the initial viral mixture to obtain a relative Ct ($\Delta\Delta Ct = \Delta Ct_{P1} - \Delta Ct_{P0}$). The relative Ct was converted to reflect the fold change in genome copies ($\Delta ratio = 2^{-\Delta\Delta Ct}$). The slope of the differences between the $\log_{10}\Delta$ ratios of the two viruses as a function of the passage number is equal to the $\log_{10}$ relative fitness of the non-barcoded virus ($[\log_{10}\Delta ratio_{non\text{-}barcoded} - \log_{10}\Delta ratio_{barcoded}]$/passage) (***Visher et al., 2016***).

Growth curves

One hundred $TCID_{50}$ of each mutant ΔHA-GFP virus (in 100 µL of media) were used to infect 1.2×10^4 MDCK-HA in a 96-well plate. At two hour intervals between 14 and 26 hr post infection, supernatants from 4 wells were transferred to a black 96-well plate containing 1.5×10^4 MDCK cells and 50 µL of viral media. Virus equivalent to the initial inoculum was added to 4 wells so that the virus present at 0 hr post infection could be determined. At 14 hr after supernatant transfer, the cells were fixed, stained and imaged as described below.

RNA minimum free energy

The minimum free energy of the ΔHA-GFP RNA was determined using the RNA sliding window python script that is included with the CodonShuffle package (***Jorge et al., 2015***).

GFP-based Luria-Delbrück fluctuation test

Passage 1 (P1) stocks of ΔHA-GFP viruses were made by passing rescued virus once on MDCK-HA cells at an MOI of 0.01 for 48 hr. For each fluctuation test, 24 or more parallel cultures of MDCK-HA cells were infected with P1 influenza viruses encoding one of the twelve ΔHA-GFP mutants in viral media (Dulbecco's modified Eagle medium (Gibco 11965) supplemented with 0.187% BSA, 25 mM HEPES, and 2 µg/mL TPCK treated trypsin [Worthington Biochemical 3740, Lakewood, NJ]). Depending on the mutation class, these infections were performed in either 96-well plates (1.2×10^4 cells infected with 400 $TCID_{50}$ of virus in 100 µL), 48-well plates (3.6×10^4 cells infected with

1200 $TCID_{50}$ of virus in 300 µL), or 24-well plates (7.2×10^4 cells infected with 2400 $TCID_{50}$ of virus in 600 µL). At 17–30 hr post infection (depending on the mutation class, drug treatment, and assay temperature) supernatants were transferred to black 96-well plates (Perkin Elmer 6005182, Waltham, MA) containing 1.5×10^4 MDCK target cells and 50 µL of viral media. Supernatants from each well of 48-well and 24-well plates were transferred in 150 µL aliquots to 2 or 4 wells of the black 96-well plate, respectively. In addition to the supernatants derived from the parallel replication cultures, two to four wells were infected with the amount of virus used to seed these cultures (see N_i, below)

At 14 hr post-infection, cells were fixed with 2% formaldehyde for 20 min, rinsed with phosphate buffered saline (PBS), and permeabilized with 0.1% triton-X-100 for 8 min. Cells were then rinsed again with PBS, incubated at room temperature for one hour in PBS with 2% BSA and 0.1% tween-20 (PBS-T), and stained with 1:5000 Hoechst (Life Technologies 33342) and 1:400 anti-GFP Alexa 647 conjugate (Life Technologies A31852) diluted in 2% BSA in PBS-T for 1 hr. Cells were washed three times with PBS-T, and the plates were sealed with black tape prior to removal of the final wash. Plates were imaged using an ImageXpress Microscope (Molecular Devices, Sunnyvale, CA) using DAPI, Cy5, and FITC-specific filter cubes with a 4x magnification lens. Four non-overlapping quadrants were imaged from each well to ensure that the entire surface area was captured, Cellular nuclei and antibody stained cells were counted using MetaXpress version 6 software (Molecular Devices). Cells expressing fluorescent GFP were manually counted from the collected images.

Mutation rates were calculated using the null-class model, $\mu_{(s/n/r)} = -\ln(P_0)/(N_f-N_i)$, where $\mu_{(s/n/r)}$ is the mutation rate per strand replicated, P_0 is the proportion of cultures that do not contain a cell infected by a virus encoding fluorescent GFP, and N_f and N_i are the final and initial viral population sizes, as determined by staining with the anti-GFP antibody, which recognizes both fluorescent and non-fluorescent eGFP (***Foster, 2006***; ***Furió et al., 2005***). Cultures that contained a number of green cells greater than or equal to 0.8 (N_f/N_i) were removed from the calculation because they were likely to have contained a pre-existing fluorescent revertant in the inoculum. These events were extremely rare given the low titer inocula. The null class model is most precise when P_0 is between 0.1 and 0.7 (***Foster, 2006***). Due to the rarity of certain mutation classes and the constraints of the maximum viral population size per culture and per well on the imaging plate, not all of our measurements fell within this range. Measurements where the P_0 was above 0.7 are indicated in the graphical representations of our data.

Ribavirin (1-[(2*R*,3*R*,4*S*,5*R*)−3,4-dihydroxy-5-(hydroxymethyl)oxolan-2-yl]−1H-1,2,4-triazole-3-carboxamide) (Sigma-Aldrich R9644, St. Louis, MO) was dissolved in PBS at 100 mM. 5-azacytidine (4-Amino-1-(β-D-ribofuranosyl)−1,3,5-triazin-2(1 hr)-one) (Sigma-Aldrich A2385) and 5-Fluorouracil (2,4-Dihydroxy-5-fluoropyrimidine) (Sigma-Aldrich F6627) were dissolved in dimethyl sulfoxide (DMSO) at 100 mM and 384 mM, respectively. For mutation rate measurements in the presence of drug, MDCK-HA cells were pretreated with viral media containing 2.5 µM ribavirin, 0.625 µM 5-azacytidine, or 15 µM 5-fluorouracil for three hours. Mutation rate assays were carried out according to the above protocol except that the viral media for the initial infections contained drugs at the indicated concentrations.

Mutation rate measurements at different temperatures were carried out as above, except that the initial replication was performed in incubators maintained at 32°C or 39°C. The imaging plates were maintained at 37°C for the 14 hr after the supernatant transfer.

The mutational transition to transversion ratio was calculated as sum of the rates of the 4 transition classes divided by the sum of the rates of the 8 transversion classes. This metric describes the relative likelihood of any new mutation being a transition as opposed to a tranversion.

Acknowledgments

This work was supported by a Clinician Scientist Development Award from the Doris Duke Charitable Foundation (CSDA 2013105) and R01 AI118886, both to ASL. MDP was supported by the Michigan Predoctoral Training Program in Genetics (T32GM007544). We thank Judy Opp and April Cockburn from the microbial sequencing core of the University of Michigan Host Microbiome Initiative for assistance with next generation sequencing, JT McCrone for assistance with sequence analysis, and Nick Santoro from the University of Michigan Center for Chemical Genomics for assistance with high content imaging and analysis. We thank Robert Woods for helpful discussion.

Additional information

Funding

Funder	Grant reference number	Author
National Institute of Allergy and Infectious Diseases	R01 AI118886	Adam S Lauring
Doris Duke Charitable Foundation	CSDA 2013105	Adam S Lauring
National Institute of General Medical Sciences	T32 GM007544	Matthew D Pauly

The funders had no role in study design, data collection and interpretation, or the decision to submit the work for publication.

Author contributions

MDP, Conceptualization, Resources, Data curation, Software, Formal analysis, Validation, Investigation, Visualization, Methodology, Writing—original draft, Writing—review and editing; MCP, Data curation, Investigation, Methodology; ASL, Conceptualization, Data curation, Formal analysis, Supervision, Funding acquisition, Validation, Investigation, Visualization, Methodology, Writing—original draft, Project administration, Writing—review and editing

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Additional files

Supplementary files

- Supplementary file 1. Nonsense mutation counts from PrimerID sequencing of the influenza PA gene.

DOI: 10.7554/eLife.26437.017

- Supplementary file 2. Influenza A virus mutation rates for PR8 and Hong Kong viruses.

DOI: 10.7554/eLife.26437.018

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Research Note—

Long-Term Study on Tenacity of Avian Influenza Viruses in Water (Distilled Water, Normal Saline, and Surface Water) at Different Temperatures

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Received 17 April 2009; Accepted and published ahead of print 12 October 2009

SUMMARY. The tenacity of three low pathogenicity avian influenza viruses (AIV; subtypes H4N6, H5N1, and H6N8) was tested at five different temperatures (−10, 0, 10, 20, and 30 C) in distilled water, normal saline, and surface water obtained from Lake Constance. Infectivity of AIV in the samples was quantified at regular intervals by end point titration on Madin-Darby canine kidney cells for a maximum period of 36 wk, and duplicate samples were tested each time. The results showed that the survival time of AIV in all of the water types was inversely proportional to storage temperature. All three viruses showed varying sensitivity to inactivation under each of the experimental conditions. Persistence of the viruses was the longest in distilled water, second longest in normal saline, and shortest in surface water. The virus-inoculated surface water remained infective for a few days at 30 and 20 C, a few weeks at 10 C, and for months at 0 and −10 C.

RESUMEN. *Nota de Investigación*—Estudio de larga duración sobre la resistencia de los virus de la influenza aviar en agua (Agua destilada, solución salina normal, y agua superficial) a diferentes temperaturas.

Se determinó la resistencia de tres cepas del virus de la influenza aviar de baja patogenicidad (subtipos H4N6, H5N1 y H6N8) bajo cinco diferentes temperaturas (−10 C, 0 C, 10 C, 20 C y 30 C) en agua destilada, en solución salina normal, y de agua de la superficie obtenida del Lago de Constanza. La infectividad del virus de la influenza aviar en las muestras se cuantificó en intervalos regulares mediante la titulación por punto final en células de riñón de perro Madin-Darby por un período máximo de 36 semanas, las muestras se analizaron por duplicado en cada momento. Los resultados mostraron que el tiempo de supervivencia de los virus de la influenza en todos los tipos de agua fue inversamente proporcional a la temperatura de almacenamiento. Los tres virus mostraron diferente sensibilidad a la inactivación bajo cada una de las condiciones experimentales. La persistencia de los virus fue más larga en el agua destilada, la segunda más larga fue en solución salina normal, y la menor fue en las aguas superficiales. El agua superficial inoculada con virus sigue siendo infecciosa por unos días a 30 C y 20 C, y por unas pocas semanas a 10 C, y durante meses cuando se conserva a 0 C y −10 C.

Key words: avian influenza, water, surface water, tenacity, temperature

Abbreviations: AAF = amniotic allantoic fluid; AIV = avian influenza viruses; CFU = colony forming units; DMEM = Dulbecco's modified Eagle medium; DW = distilled water; FCS = fetal calf serum; FLI = Friedrich-Loeffler-Institute; HPAI = highly pathogenic avian influenza; MDCK = Madin-Darby canine kidney cells; NEA = non essential amino acids; NS = normal saline; ppm = parts per million; SW = surface water; $TCID_{50}$ = median tissue culture infective dose

Avian influenza is an infectious viral disease of birds caused by type A influenza viruses, which commonly infect poultry and wild birds. Migratory waterfowl and shorebirds are key reservoirs of influenza A viruses, and all known virus subtypes have been identified in these birds (5,12). Infected birds shed large numbers of virus particles in their feces, as well as in saliva and nasal discharge (10). One infected duck can shed 10^{10} EID_{50} of the virus through feces in a period of 24 hr, which can lead to contamination of the environment, particularly of water (13). The contaminated water may act as a potential source of virus transmission to susceptible populations, especially in areas where large numbers of birds congregate. Several influenza viruses have been isolated from unconcentrated lake water (3,4), concentrated pond water (6), and in some cases from lake water even after the migration of nesting birds (4).

The fact that influenza viruses are maintained in aquatic bird populations by water-borne transmission is well established (4,6), but information on survival of avian influenza viruses (AIV) in aquatic habitats is not sufficient to completely understand the epidemiology of these viruses. Experimental data on the persistence of AIV in water demonstrated that virus subtype H3N6 was detectable for 32 days at 4 C and 4 days at 22 C in nonchlorinated water mixed with infected feces (13). A model distilled water system developed in the laboratory to assess the effects of temperature, pH, and salinity on the persistence of various AIV proved that some strains remain infectious for up to 207 days at 17 C and 102 days at 28 C, and there was a strong interactive effect between pH and salinity (8,9). A similar experimental model system used later to estimate the persistence of wild-type H5 and H7 AIV as well as highly pathogenic avian influenza (HPAI) H5N1 viruses in water demonstrated that viral persistence is inversely proportional to storage temperature and salinity of water. Likewise there was a significant interaction between the effects of temperature and salinity on viral persistence, with the effect of salinity more prominent at lower temperatures. The HPAI viruses were found to be more sensitive than wild-type viruses (2).

Most of the experiments done so far on the persistence of AIV in water have been carried out for durations of up to 60 days, and only a few samples were tested for longer time periods. Also, the temperature range selected was not wide enough to completely explain the survival of AIV in diverse environmental conditions. In

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certain parts of the world the temperature of water bodies which are along the common flyway of migratory birds remains around the freezing point either for part or all of the year. Similarly, very limited work has been done on the survival of AIV in surface water (SW). The present study was designed to assess the survival of AIV in different water types: distilled water (DW), normal saline (NS), and SW at a wide range of temperatures for an extended period of time (months).

MATERIALS AND METHODS

Virus propagation. The three low pathogenicity AIV: A/mallard/Germany/Wv1732-34/03 (H4N6), A/teal/Germany/Wv632/05 (H5N1), and A/mute swan/Germany/R2927/07 (H6N8) used in this study were obtained from PD Dr. Timm Harder, Friedrich-Loeffler-Institute (FLI), Insel Riems, Germany. The viruses were propagated in the allantoic cavity of 9-to-11-day-old specific-pathogen-free embryonated chicken eggs (Lohmann, Cuxhaven, Germany). The eggs were incubated at 37 C for 72 hr postinoculation. Infective amniotic allantoic fluid (AAF) was harvested after an overnight chilling of the eggs and stored at −80 C for future use. In all of the experiments low passage number (second or third) viruses were used.

Infectivity assay/biological titration. Infectivity titers of AIV in the samples were calculated by end point titration on Madin-Darby canine kidney cells (MDCK). MDCK were obtained from the FLI, Insel Riems, Germany, and cells in use were replaced after each 30 passages by new cells from frozen stock. The cells were subcultured using Dulbecco's modified Eagle medium (DMEM; Biochrom, Berlin, Germany) supplemented with 5% fetal calf serum (FCS; Biochrom) and 1% nonessential amino acids (NEA; Biochrom) to a final concentration of 10^6/ml and dispensed in a volume of 0.1 ml to each well of a 96-well plate. The plates were incubated at 37 C and 5% CO_2 for 24 hr to attain 90% confluency. The water samples were diluted tenfold in maintenance medium: DMEM supplemented with 2% FCS, 1% NEA, and antimicrobial agents: gentamicin sulphate 6.4 U, penicillin-G 200 U, streptomycin sulphate 380 U, and amphotericin-B 1 µg/ml (all from Biochrom). Growth medium was discarded from the plates, and 0.1 ml of maintenance medium containing appropriate virus dilution was dispensed in the respective wells. For the undiluted samples, 0.1 ml of 2× maintenance medium was added to the 0.1-ml virus suspension. In cell control wells, 0.1 ml of the maintenance medium was added. The plates were again incubated at 37 C and 5% CO_2 for 7 days. The results were recorded by checking cytopathic effects under a light microscope. A complete destruction of the cell monolayer was regarded as positive for virus growth. Confirmation of the results was carried out by the hemagglutination test (7), which was performed independently for each plate in a separate U bottom 96-well plate. The median tissue culture infective dose ($TCID_{50}$) values were calculated by the Spearman-Kärber method as described earlier (11). Minimum detectable limit of the assay was $TCID_{50}$ $10^{1.75}$/ml.

Experimental design. Three different water types were used to study the tenacity of avian influenza viruses: DW with a pH 7.80; NS, 0.9% weight/volume solution of NaCl, pH 7.20; and SW obtained from Lake Constance. The DW and NS were autoclaved after the adjustment of pH by sterile 0.1 M HCl and NaOH to respective values. For each of the virus types infective AAF was mixed in a ratio of 1:10 for DW and NS, dispensed in sterile 1.5-ml polypropylene tubes (Eppendorf AG, Hamburg, Germany) in a volume of 1 ml per tube. The tubes were equally divided into five groups and placed in thermostatically controlled incubators whose temperatures were previously adjusted to −10, 0, 10, 20, and 30 C. Titration of the samples was carried out on day 0 and then afterward at regular intervals: after each 2 days at 30 C, 4 days at 20 C, 14 days at 10 C, and 28 days at 0 and −10 C for DW and NS.

SW was collected about 2 m from the shore of Lake Constance from Langenargen, Germany, transported to the laboratory below 10 C, and stored at 4 C until used. The water was checked for presence of any endogenous influenza virus as well as cytotoxicity to MDCK cells and found to be negative. SW was used for tenacity trials without any treatment and also subjected to chemical analysis. Bacterial counts in surface water were done at the beginning and when no virus was detectable in virus-inoculated samples. The infective AAF was mixed in lake water at a ratio of 1:100; as in spiking trials, adding a high concentration of AAF to lake water promoted intense microbial growth while adding too little AAF provided insufficient virus titers for tenacity studies. The pH in the spiked samples was measured at the beginning and at the end of the trials. Samples were distributed into small tubes and placed at five different temperatures as described above. Similarly, titration of all of the samples was carried out at the start of the experiments and then afterward at regular intervals, i.e., daily at 30 C, every 2 days at 20 C, every 7 days at 10 C, and every 14 days at 0 and −10 C. Before titration, each of the surface water samples was centrifuged at 5000 × *g* for 10 min and filtered through 0.45-µm pore size disposable syringe filters (Th. Geyer, Renningen, Germany).

Duplicate samples were tested at each time point for all of the treatment groups. The samples were tested for a maximum of 36 wk. However, the titration of respective samples was terminated if no virus was detectable for two successive attempts. In virus-inoculated water samples, pH was tested at the termination of experiments and found to be around the adjusted values with a difference of ±0.1.

Analysis of experimental results. For all of the groups, infectivity titers of duplicate samples were recorded for each titration as $TCID_{50}$ in the form of log base 10. For the average value, the logarithmic figures were changed to arithmetic numbers and their mean was again converted to logarithmic values. The serial data thus obtained was analyzed by a linear regression model with the help of Microsoft excel (Microsoft Office Excel 2007; Microsoft Corporation, Redmond, WA). The estimated persistence of viral infectivity with a starting viral concentration of 10^6 as well as T-90 values (time required for one log reduction in the virus titer) was calculated using this model.

RESULTS

Surface water analysis. The total bacterial count in the SW was 1.15×10^2 colony forming units (CFU)/ml. The count increased in the virus-inoculated samples to 1.8×10^7 CFU/ml at 30 C after 7 days, 3.3×10^7 CFU/ml at 20 C after 14 days, and 7.9×10^6 CFU/ml at 10 C after 21 days. No significant increase in the bacterial count was observed in the samples stored at 0 and −10 C. Furthermore, fungal growth in the form of small balls was evident in some of the tubes stored at 10 C and associated with comparatively low virus titers. The other parameters checked were pH, 7.84; hardness, 7.4 °dH; electric conductivity, 280 µS/cm; salinity, 150 parts per million (ppm); Ca, 42 mg/L; and Mg, 7.9 mg/L. The pH remained relatively constant until the end of the trials at all temperatures, falling to 7.44 in some cases.

Virus persistence. Linear regression models to demonstrate the expected persistence of the tested AIV in various water types at specified temperatures are presented in Table 1. In general, viruses remained infective the longest in DW, followed by NS, followed by SW. In order to have a better comparison of all treatment groups, T-90 values are also shown in Table 1. Based upon the T-90 data, all three viruses were dissimilar in their sensitivity to inactivation under each of the conditions studied. In the SW samples stored at 30, 20, 10, 0, and −10 C, H4N6 with a starting virus titer of $10^{4.14}$/ml was detectable for 4, 8, 35, 56, and 182 days; H5N1 with a starting virus titer of $10^{4.5}$/ml was detectable for a maximum period of 3, 6, 21, 112, and 182 days; and H6N8 with a starting virus titer of $10^{5.14}$/ml was detectable for 7, 12, 42, 112, and 224 days, respectively.

DISCUSSION

In the current study a remarkable difference was observed in the persistence of AIV in various water types. The individual viruses

Table 1. Linear regression models for the tenacity of avian influenza viruses in distilled water, normal saline and surface water at various temperatures.

	Distilled water[A]			Normal saline[B]			Surface water[C]		
Virus type	Linear regression model	R^2	Estimated persistence[D] (T-90 value)	Linear regression model	R^2	Estimated persistence (T-90 value)	Linear regression model	R^2	Estimated persistence (T-90 value)
30 C									
H4N6	$y = 5.224 - 0.129x$	0.917	46 (8)	$y = 4.426 - 0.172x$	0.915	35 (6)	$y = 3.479 - 0.434x$	0.828	14 (2)
H5N1	$y = 5.050 - 0.198x$	0.916	30 (5)	$y = 4.630 - 0.179x$	0.943	33 (6)	$y = 3.570 - 0.469x$	0.735	13 (2)
H6N8	$y = 5.587 - 0.078x$	0.828	77 (13)	$y = 5.869 - 0.419x$	0.956	14 (2)	$y = 4.037 - 0.423x$	0.809	14 (2)
20 C									
H4N6	$y = 5.764 - 0.069x$	0.869	86 (15)	$y = 5.316 - 0.084x$	0.954	71 (12)	$y = 3.522 - 0.266x$	0.9	23 (4)
H5N1	$y = 5.026 - 0.071x$	0.864	84 (14)	$y = 5.130 - 0.079x$	0.948	76 (13)	$y = 3.522 - 0.320x$	0.824	19 (3)
H6N8	$y = 5.485 - 0.027x$	0.904	221 (37)	$y = 5.312 - 0.146x$	0.958	41 (7)	$y = 4.704 - 0.305x$	0.928	20 (3)
10 C									
H4N6	$y = 4.709 - 0.008x$	0.83	729 (121)	$y = 5.014 - 0.017x$	0.929	353 (59)	$y = 3.536 - 0.070x$	0.914	85 (14)
H5N1	$y = 5.019 - 0.012x$	0.909	508 (85)	$y = 4.725 - 0.015x$	0.87	410 (68)	$y = 3.485 - 0.099x$	0.834	61 (10)
H6N8	$y = 5.512 - 0.005x$	0.851	1185 (197)	$y = 4.911 - 0.014x$	0.91	419 (70)	$y = 4.350 - 0.074x$	0.84	82 (14)
0 C									
H4N6	$y = 5.059 - 0.002x$	0.79	2656 (443)	$y = 5.155 - 0.005x$	0.957	1140 (190)	$y = 3.909 - 0.032x$	0.776	188 (31)
H5N1	$y = 4.967 - 0.003x$	0.526	2295 (383)	$y = 5.244 - 0.005x$	0.954	1112 (185)	$y = 3.328 - 0.029x$	0.693	208 (35)
H6N8	$y = 5.429 - 0.002x$	0.721	3347 (558)	$y = 5.440 - 0.006x$	0.88	1013 (169)	$y = 4.374 - 0.029x$	0.835	206 (34)
−10 C									
H4N6	$y = 5.008 - 0.002x$	0.654	3850 (642)	$y = 5.120 - 0.003x$	0.703	1929 (321)	$y = 4,449 - 0.018x$	0.895	328 (55)
H5N1	$y = 4.996 - 0.002x$	0.667	3454 (576)	$y = 5.244 - 0.004x$	0.913	1415 (236)	$y = 4.376 - 0.017x$	0.893	350 (58)
H6N8	$y = 5.425 - 0.002x$	0.799	3565 (594)	$y = 5.488 - 0.004x$	0.796	1399 (233)	$y = 5.313 - 0.015x$	0.788	395 (66)

[A]Distilled water with a pH of 7.80.
[B]Normal saline: 0.9% W/V solution of NaCl; pH 7.20.
[C]Surface water obtained from Lake Constance. y, virus titer in $TCID_{50}$/ml; *x*, persistence in days.
[D]Estimated persistence in days with a starting virus concentration of 10^6 $TCID_{50}$/ml; T-90 value: Time duration in days required for 90% reduction in viral infectivity.

were also inconsistent in their sensitivity to inactivation under all experimental conditions. Infectivity of the viruses was preserved for a maximum period of time in distilled water. The role of certain physicochemical factors representing natural aquatic environments on the persistence of AIV in water has been extensively studied. The individual or interactive effect of the factors studied has shown that persistence is dependent on temperature, pH, and salinity of the waters (1,2,8,9). The model distilled water system used in previous trials was logical for focusing on lab adjusted values of these factors, but the ecology of natural surface water is quite complex, and in addition to pH and salinity many other biotic and abiotic elements may also influence the survival of AIV in this medium. As evident from our results, the survival time of AIV in SW is comparatively shorter than in DW and NS at all temperatures. It is likely that the AAF containing virus added to the samples promoted the microbial growth at high temperatures and could have resulted in quick inactivation of viral particles either by microbial metabolites or by passive adherence of virus particles to the microbes and subsequent removal following centrifugation and filtration. However, at low temperatures in which no microbial growth was observed, the survival time was still much shorter as compared to distilled water, indicating the role of unidentified factors prevailing in natural surface water on viral persistence. The complication produced by microbial growth after adding AAF as a virus source can be avoided by using purified virus. But in reality infected birds excrete influenza viruses via feces or body secretions (10) which, in addition to being highly contaminated, may also act as foodstuff for microorganisms. Therefore the role of biotic factors in water ecology should not be forgotten. Our experiments were an initial attempt to mimic the influence of these biotic factors on AIV persistence under laboratory conditions.

Physiological saline was used to measure the tenacity of influenza viruses in a medium whose osmotic pressure is equivalent to body fluids/secretions. The persistence of AIV under these conditions was found to be lower as compared to DW. The differences were particularly evident at low temperatures. It appears that the high salinity level in NS of 9000 ppm is the only responsible factor for the short survival time of the viruses in relation to DW. This is in accordance with previous reports (2,8) in which the salinity had a negative effect on viral persistence and this effect was more prominent at lower temperatures.

Testing duplicate samples during the whole study period reduced the effects of experimental errors and hence conferred higher coefficients of determination (R^2) values as presented in Table 1. Generally the R^2 values calculated by linear regression models in the present study are greater than those reported previously (2). The use of a continuous cell line in combination with extensive sampling and a long-term experimental approach might have helped to produce consistent results in the current study.

Viruses were more readily inactivated in SW than in DW. In a previous study, the persistence of an influenza virus checked in five different surface waters was the same as in DW except in water with high salinity (8). The samples in that study were filtered prior to virus inoculation, which might explain the results, as in another study an enormous difference was observed in the survival of influenza viruses between filtered and unfiltered natural water (15). In our study, viral persistence in SW was shorter than in DW, but this trend was variable between the different temperatures: at 30 and 20 C the survival time in SW was 3–5 times shorter, while at lower temperatures it was 8–12 times shorter than in DW as illustrated in Table 1. As previously described (1,2,8), one possible reason for such results could be high water salinity. However, the salinity of the water from Lake Constance was 150 ppm, which should not have had a strong effect on viral persistence. This indicates that undefined factors present in the lake water have a strong effect at lower temperatures. Hence much more information is required before reaching a conclusion about the viral persistence in freshwater habitats. However, AIV were able to survive in SW for a few days at 30 and 20 C and even for a few weeks at 10 C. Following excretion by infected birds, AIV may be readily diluted in large volumes of flowing water (13), but in the stagnant water of small ponds or lakes where a large number of birds gather, there is a clear danger of virus spread to susceptible birds. At extremely low temperatures (0 and −10 C) the AIV survived for several months. This explains the mechanism by which water basins in some frozen lakes could harbor virus over winter until the following spring as hypothesized previously (14). Sometimes fecal material passed by infected ducks near the banks of water bodies does not completely dissolve in the water but is rather deposited at the bottom, preserving the virus in the sediment. The diving ducks could ingest these infected materials when searching for food at the bottom of contaminated lakes. An estimation of viral persistence in lake sediment and bird feces is therefore also necessary to comprehend the epidemiology of AIV in the environment.

The results of this study suggest that the persistence of AIV in aquatic habitats is inversely proportional to the water temperature. Influenza viruses may remain infective in SW for periods ranging from a few days to several months depending upon the environmental temperature. These findings underline the importance of water as a factor in the maintenance and spread of avian influenza virus infections.

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ACKNOWLEDGMENTS

This study was financed by a grant from the Ministerium für Ernährung und Ländlichen Raum Baden-Württemberg, Germany, in the research program "Wildvögel und Vogelgrippe."

3. By way of derogation from paragraph 1(a), the competent authority may, after carrying out a risk assessment, allow slaughter of fish or crustaceans or in case of molluscs removal from water, for human consumption, at the establishment or in a disease aquatic control food establishment, provided that appropriate biosecurity and other necessary risk-mitigating measures to prevent the spread of the category A disease are taken. All animal by-products resulting from that derogation shall, by way of derogation from Article 10(i) of Regulation (EC) No 1069/2009, be processed or disposed of as category 1 or category 2 material in accordance with that Regulation.

4. By way of derogation from paragraph 1(d), the competent authority may, after carrying out a risk assessment, decide not to kill, slaughter or remove from water aquaculture animals of non-listed species provided that appropriate risk-mitigating measures are applied to prevent any risk of spreading of the relevant category A disease from the establishment.

5. By way of derogation from paragraph 1(f)(ii), the competent authority may, after carrying out a risk assessment, allow the placing on the market of products of animal origin in accordance with Article 83.

Article 79

Specific derogations from control measures in establishments where listed species are kept for scientific purposes or purposes related to conservation of endangered species

1. The competent authority may grant derogations from the measures provided for in Article 78(1)(a) and (c) in the event of an official confirmation of a category A disease in establishments where listed species are kept for scientific purposes or purposes related to conservation of endangered species, provided that:

(a) the animal health status of the concerned Member State, or of other Member States, is not jeopardised; and

(b) all appropriate biosecurity measures as listed in Article 78 are taken to prevent any risk of spreading of the category A disease agent.

2. Where a derogation is granted pursuant to paragraph 1, the competent authority shall ensure that aquaculture animals of listed species covered by the derogation are:

(a) kept in premises where appropriate biosecurity measures to avoid spread of the relevant category A disease are implemented; and

(b) subjected to further surveillance and laboratory examination and are not moved from the establishment until the laboratory tests have indicated that they do not pose a risk of further spread of the relevant category A disease.

Article 80

Cleaning and disinfection

1. The competent authority shall order the operators to carry out, immediately after the completion of the disease control measures provided for in Article 78, the cleaning and disinfection of:

(a) the establishment, as far as the competent authority considers it is technically possible;

(b) any husbandry-related equipment including but not limited to feeding, grading, treatment, vaccination and workboats;

(c) any production-related equipment including but not limited to cages, netting, trestles, bags and long-lines;

(d) any protective clothing or safety equipment used by operators and visitors; and

(e) all means of transport including tanks and other equipment used to move infected animals or personnel who have been in contact with infected animals.

2. The cleaning and disinfection as provided for in paragraph 1 shall be carried out:

(a) in accordance to a protocol previously agreed between the competent authority and the operator; and

(b) under the supervision of official veterinarians.

Article 81

Fallowing of the affected establishment

The competent authority shall order operators to carry out, after the completion of the cleaning and disinfection provided for in in Article 80, the fallowing of the affected establishment for the period of time laid down in Annex XIII.

Article 82

Extension of disease control measures in the event of confirmation of a category A disease

In order to prevent the spread of a category A disease the competent authority shall conduct an investigation provided for in Article 71 and after carrying out a risk assessment, extend some or all of the measures provided for in Articles 78, 80 and 81 to:

(a) establishments of the same compartment or which due to distance, hydrodynamic conditions or topographic conditions, have an increased risk for contracting the relevant disease agent from the suspected establishment where the disease is confirmed;

(b) any establishment which as a result of the enquiry provided for in Article 57 of Regulation (EU) 2016/429, has shown a direct epidemiological link with the establishment where the disease is confirmed.

Article 83

Placing on the market of products of animal origin from aquaculture animals of listed species produced in infected establishments

1. When granting a derogation pursuant Article 78(5), the competent authority may allow the placing on the market of products of animal origin only if the following conditions are fulfilled:

(a) fish must be slaughtered and eviscerated before dispatch;

(b) molluscs and crustaceans must be fully traceable and processed to non-viable products unable to survive if returned to the water, before dispatch.

When purification is required before processing and placing on the market, it shall be conducted at a disease control aquatic food establishment or in a bio-secure purification centre.

2. The products of animal origin referred to in paragraph 1 shall be intended for:

(a) to the final consumer directly; or

(b) for further processing in a disease control aquatic food establishment.

Article 84

Measures to be applied in the event of confirmation of category A diseases in, food and feed businesses, purification centre, dispatch centre, border control posts or any other location of relevance, including means of transport

1. In the event of confirmation of a category A disease in food and feed businesses, purification centre, dispatch centre, border control posts or any other location of relevance, including means of transport, in accordance with Article 77, the competent authority shall apply:

(a) the measures provided for in Articles 78, Article 80 and Article 81; and

(b) if needed, additional measures adapted to the specific situation in order to prevent the spread of the category A disease from the affected animals and establishments or locations to unaffected animals.

2. The competent authority shall apply provisions laid down in Articles 78, Article 80 and Article 81 also in the establishments of origin of the animals or products present in the establishments and locations referred to in paragraph 1.

ANNEX XI

DURATION OF THE MEASURES IN THE SURVEILLANCE ZONE

(as referred to in Articles 55 and 56 of this Regulation)

Category A diseases	Minimum period of duration of measures in the surveillance zone
Foot and mouth disease	30 days
Infection with rinderpest virus	30 days
Infection with Rift Valley fever virus	45 days
Infection with lumpy skin disease virus	45 days
Infection with *Mycoplasma mycoides subsp. mycoides SC* (Contagious bovine pleuropneumonia)	45 days
Sheep pox and goat pox	30 days
Infection with peste des petits ruminants virus	30 days
Contagious caprine pleuropneumonia	45 days
African horse sickness	12 months
Infection with *Burkholderia mallei* (Glanders)	Not applicable
Classical swine fever	30 days
African swine fever	30 days
Highly pathogenic avian influenza	30 days
Infection with Newcastle disease virus	30 days

ANNEX XII

SAMPLING PROCEDURES AND DIAGNOSTIC METHODS FOR CATEGORY A DISEASES IN AQUATIC ANIMALS

1. The following procedures apply to the clinical examination and collection of samples:

(a) the clinical examination and the sampling for laboratory examinations must include:

(i) aquaculture animals of listed species showing clinical signs of the relevant category A disease; and

(ii) aquaculture animals likely to have recently died from the suspected/confirmed category A disease; and

(iii) aquaculture animals with an epidemiological link to a suspected or confirmed case of a category A disease;

(b) the minimum number of samples to be collected is:

	Scenario			
Type of animals	Report of increased mortality	Introduction of infected animals	Post-mortem or clinical signs observed	Suspicion based on other circumstances
Molluscs (the whole animal)	30	30	—	150
Crustaceans	10		10	150
Fish	—	—	10	30

(c) the following additional criteria apply to the sampling of molluscs:

(i) animals suspected to be infected must be selected for sampling. If listed species are present in the population of animals concerned by the suspicion, those must be selected for sampling;

(ii) if weak, gaping or freshly dead but not decomposed molluscs are present, those must be selected first. If such molluscs are not present, the molluscs selected must include the oldest healthy molluscs;

(iii) if the establishment uses more than one water source for mollusc production, molluscs representing all water sources must be included for sampling to ensure that all parts of the establishment are proportionally represented in the sample;

(iv) when sampling from a group of mollusc farming establishments which apparently have identical epidemiological status, molluscs from a representative number of sampling points must be included in the sample.

The main factors to be considered when selecting those sampling points must be stocking density, water currents, the presence of listed species, both susceptible and vector species, bathymetry and management practices. Natural beds within or adjacent to the mollusc farming establishment(s) must be included in the sample;

(d) the following additional criteria apply when sampling crustaceans:

(i) if weak or moribund crustaceans of listed species are present in the production units, those crustaceans must be selected first. If such animals are not present, the crustaceans selected must include crustaceans of different year classes, proportionally represented in the sample;

(ii) if more than one water source is used for crustacean production, crustaceans of listed species representing all water sources must be included in the sample to ensure that all parts of the establishment are proportionally represented in the sample;

(iii) when collection of samples from wild populations of listed species is required under Article 102(a) of this Regulation, the number and geographical distribution of the sampling points must be determined in a way that ensures a reasonable coverage of the area suspected to be infected.

The sampling points must be representative for the different ecosystems where the wild populations of susceptible species are located such as marine, estuary, river and lake systems;

(e) the following additional criteria apply for sampling fish:

(i) if weak, abnormally behaving or freshly dead but not decomposed fish are present, those fish must be selected. If such animals are not present, the fish selected must include fish of listed species, belonging to different year classes, proportionally represented in the sample;

(ii) if more than one water source is used for fish production, listed species representing all water sources must be included for sampling to ensure that all parts of the establishment are proportionally represented in the sample;

(iii) if rainbow trout (*Onchorynchus mykiss*) or European perch (*Perca fluviatilis*) are present, only fish of those species may be selected for sampling. If neither rainbow trout nor European perch are present, the sample must be representative of all other listed species present, following the criteria in points (a) to (d);

(iv) when collection of samples from wild populations of listed species is required under Article 102(a) of this Regulation, the number and geographical distribution of the sampling points must be determined in a way that ensures a reasonable coverage of the area suspected to be infected.

The sampling points must also be representative of the different ecosystems where the wild populations of susceptible species are located such as marine, estuary, river and lake systems;

(f) the selection of organs to be sampled, preparation, storage and shipment of the samples to the laboratory must be carried out in compliance with recommendations from the European Union reference laboratory for the relevant disease.

2. Samples must be examined in the laboratory using the diagnostic methods and procedures approved by the European Union reference laboratory for the relevant disease.

ANNEX XIII

MINIMUM PERIODS OF FALLOWING OF AFFECTED AQUACULTURE ESTABLISHMENTS

Periods for the fallowing provided for in Article 81 and for the synchronous fallowing provided for in Article 96(4) and (5) of this Regulation

Category A disease	Minimum period of fallowing of the affected establishment	Minimum period of synchronised fallowing of affected establishments in the same protection zone	Supplementary requirements
Infection with *Mikrocytos mackini*	6 months	4 weeks	Must include the coldest period of the year
Infection with *Perkinsus marinus*	6 months	4 weeks	Must include the warmest period of the year
Infection with *Taura syndrome virus*	6 weeks	4 weeks	Must include the warmest period of the year
Infection with *Yellow head syndrome virus*	6 weeks	3 weeks	Must include the warmest period of the year
Epizootic haematopoietic necrosis	8 weeks	4 weeks	Must include the warmest period of the year

COMMISSION DELEGATED REGULATION (EU) 2020/687

of 17 December 2019

supplementing Regulation (EU) 2016/429 of the European Parliament and the Council, as regards rules for the prevention and control of certain listed diseases

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Regulation (EU) 2016/429 of the European Parliament and of the Council of 9 March 2016 on transmissible animal diseases and amending and repealing certain acts in the area of animal health (the 'Animal Health Law') ([1]), and in particular Article 47(1), Article 53(2), Article 54(3), Article 55(2), Article 58(2), the first paragraph of Article 63, Article 64(4), the first paragraph of Article 67, Article 68(3), Article 70(3), Article 72(2), Article 73(3), Article 74(4), Article 76(5), Article 77(2) and Article 272(2) thereof,

Whereas:

(1) Regulation (EU) 2016/429 lays down rules for the prevention and control of animal diseases which are transmissible to animals or to humans, including rules on disease awareness, preparedness and control. In particular, Regulation (EU) 2016/429 lays down disease-specific rules for the prevention and control of diseases referred to in its Article 5. Regulation (EU) 2016/429 also provides that those disease-specific rules apply to species and groups of animal species that pose a considerable risk for the spread of specific diseases and which are listed as such in Commission Implementing Regulation (EU) 2018/1882 ([2]).

(2) It is necessary to lay down rules supplementing the rules on disease control measures set out in Title II of Part III of Regulation (EU) 2016/429 for certain listed diseases. Those supplementing rules and the rules set out in Regulation (EU) 2016/429 are closely linked and should be applied in tandem. In the interest of simplicity, transparency and ease of application, the supplementing rules should be laid down in a single act rather than in a number of separate acts with many cross-references and risks of duplication.

(3) Article 53, Article 54(3), Article 55(2), Article 58(2), and Articles 63, 64, 67, 68 and 70 in Chapter 1 of Title II of Regulation (EU) 2016/429 relate to various technical aspects of the measures to be taken if there is suspicion and confirmation of diseases referred to in Article 9(1)(a) of that Regulation. Similarly, Article 72(2), Article 73(3), Article 74(4), Article 76(5) and Article 77 in Chapter 2 of Title II of Regulation (EU) 2016/429 relate to technical aspects of the measures to be taken if there is suspicion and confirmation of diseases referred to in Article 9(1)(b) and (c) of that Regulation.

(4) The rules to be laid down pursuant to Articles in Title II are interrelated as they apply to disease control measures for different categories of listed diseases in Regulation (EU) 2016/429. Therefore, for the effective application of those rules and in the interests of clarity, they should be laid down in a single delegated act providing a comprehensive set of technical measures for the control of listed diseases and contributing to the overall simplification of the legal framework on animal disease control.

([1]) OJ L 84, 31.3.2016, p. 1.

([2]) Commission Implementing Regulation (EU) 2018/1882 of 3 December 2018 on the application of certain disease prevention and control rules to categories of listed diseases and establishing a list of species and groups of species posing a considerable risk for the spread of those listed diseases (OJ L 308, 4.12.2018, p. 21).

(5) Previous disease control provisions were laid down in a number of directives, each of which contained rules for one or few animal diseases. Some of those rules have been replaced by Regulation (EU) 2016/429, while others need to be replaced by this Delegated Regulation in order to simplify and remove possible inconsistencies. This will provide clear, harmonised and detailed rules to control animal diseases throughout the Union. This will also enable the application of the relevant provisions by competent authorities and operators, and will increase the transparency of the rules and therefore will ensure a better response to animal disease risks.

(6) To eradicate an outbreak of a category A disease as soon as possible and to ensure a high level of animal health and animal welfare protection, it is necessary to provide for disease control measures at Union level.

(7) The scope of this Regulation should therefore include disease control measures for category A diseases in terrestrial and aquatic animals, as well as certain disease control measures for category B and C diseases. In the case of category B and C diseases, those disease control measures should be applied in conjunction with the rules on surveillance and eradication set out in Commission Delegated Regulation (EU) 2020/689 ([3]).

(8) The disease control measures set out in this Delegated Regulation should apply to animals and to products obtained from animals, including products of animal origin, germinal products, animal by-products and derived products. These animal by-products are subject to public and animal health rules set out in Regulation (EC) No 1069/2009 of the European Parliament and of the Council ([4]). The rules for safe collection, disposal and processing of animal by-products and derived products laid down in that Regulation apply in the event of the onset of a category A disease. However, that Regulation does not include disease control measures and restrictions intended to apply in such events. Therefore, those rules should be provided for in this Delegated Regulation.

(9) Directive 2008/68/EC of the European Parliament and of the Council ([5]) lays down rules for the safe transport of dangerous goods. When transporting infected animal by-products or other infected material which may be considered as dangerous goods, competent authorities should comply with the rules laid down in that Directive.

(10) It is appropriate to follow a single approach for the measures to apply in the event of a category A disease. However, the epidemiology of diseases should be taken into account to establish the appropriate moment for the competent authority to apply control measures and to carry out investigations if there is suspicion or confirmation of those diseases. Therefore 'monitoring periods' should be provided, as reference time frames for each category A disease affecting terrestrial animals based on incubation periods and other relevant elements that may affect the spread of the disease.

(11) Article 54 of Regulation (EU) 2016/429 requires the competent authority to carry out investigations on the occurrence of a category A disease at different stages: (i) when the disease is suspected; (ii) when the disease is confirmed; and (iii) when it is necessary to rule out its spreading to epidemiologically linked establishments and locations as well as neighbouring establishments and zones. Those investigations include clinical examination and sampling for laboratory testing. It is appropriate to lay down general rules on sampling in order to ensure the validity of sampling procedures, diagnostic methods and biosecurity measures.

(12) Article 43 of Regulation (EU) 2016/429 requires the competent authority to draw up and update contingency plans and, where necessary, provide detailed instruction manuals on implementing of measures to be taken in case of a category A disease as provided for in Part III of that Regulation. The measures set out in this Delegated Regulation supplement those laid down in Part III of Regulation (EU) 2016/429 and it is therefore necessary that they be implemented in accordance with the contingency plans provided for in Regulation (EU) 2016/429.

([3]) Commission Delegated Regulation (EU) 2020/689 of 17 December 2019 supplementing Regulation (EU) 2016/429 of the European Parliament and of the Council as regards rules for surveillance, eradication programmes, and disease-free status for certain listed and emerging diseases (see page 211 of this Official Journal).

([4]) Regulation (EC) No 1069/2009 of the European Parliament and of the Council of 21 October 2009 laying down health rules as regards animal by-products and derived products not intended for human consumption and repealing Regulation (EC) No 1774/2002 ('Animal by-products Regulation') (OJ L 300, 14.11.2009, p. 1).

([5]) Directive 2008/68/EC of the European Parliament and of the Council of 24 September 2008 on the inland transport of dangerous goods (OJ L 260, 30.9.2008, p. 13).

(13) Articles 53 and 55 of Regulation (EU) 2016/429 lay down obligations on operators and competent authorities in the case of a suspicion of a category A disease. The aim is to prevent the spread of the disease from affected animals and establishments under their responsibility to unaffected animals or to humans even before the disease has been confirmed. The disease control and biosecurity measures provided for in Regulation (EU) 2016/429 should be applied at this early stage in the affected establishment as regards movements of animals and products from and to that establishment and its surroundings. It is also necessary to detail those measures in order to ensure their effectiveness and proportionality.

(14) Article 54 of Regulation (EU) 2016/429 requires the competent authority to conduct an official investigation if there is a suspicion of a category A disease, to either confirm or rule out the presence of the disease. In order to establish a standard operating procedure for such official investigations in all Member States, it is necessary to detail the circumstances which justify the conduct of an investigation, the minimum investigation tasks to be performed by official veterinarians and the way those tasks should be carried out.

(15) Regulation (EU) 2016/429 requires that, if there is a suspicion or confirmation of a category A disease, disease control measures be applied not only in establishments keeping animals but also in food and feed businesses, in animal by-products establishments or in other locations that may pose a risk of spreading of diseases. It is necessary to specify which control measures apply in those cases, in particular in the case of border control posts and means of transport.

(16) Regulation (EU) 2016/429 requires that the confirmation of a category A disease is the starting point for the competent authority to implement stricter disease control measures than those applied in the suspicion phase and to carry out further investigations. It is therefore necessary to specify when a category A disease should be considered confirmed. This confirmation should be done in accordance with Union acts adopted pursuant to Regulation (EU) 2016/429 on surveillance of diseases, eradication programmes and disease-free status.

(17) Regulation (EU) 2016/429 lays down the basic rules on the disease control measures to apply in the affected establishments in the event of an outbreak of a category A disease. At the same time, it provides competent authorities with a certain flexibility in deciding which of those measures should apply. In order to allow competent authorities to take the most proportionate and efficient control measures and ensure a harmonised implementation of the measures taken by Member States, it is appropriate to establish detailed decision making criteria based on epidemiological circumstances, type and location of establishments, species and categories of animals and economic or social conditions of the area affected by the disease.

(18) The competent authority should have the possibility to grant, in justified cases and under supplementary guarantees if necessary, derogations from certain disease control measures, in particular from the requirement to kill the animals in the affected establishment, taking into account epidemiological factors and after carrying out an accurate risk assessment. Such derogations could be granted for confined establishments, for animals kept for scientific purposes or for purposes related to conservation of protected or endangered species and for officially registered rare breeds or for animals with a justified high genetic, cultural or educational value. In such cases, the application of general measures could have undesirable and disproportioned consequences.

(19) In order to adapt the disease control measures to each specific situation, the competent authority should have the possibility to apply disease control measures that are not specifically provided for in Regulation (EU) 2016/429 or in this Delegated Regulation, taking into consideration epidemiological factors and after carrying out a risk assessment.

(20) Cleaning and disinfection in the affected establishment is one of the basic disease control measures provided for in Regulation (EU) 2016/429 to minimise the risk of spreading a confirmed category A disease. Preliminary cleaning and disinfection are the most effective measures to reduce the disease agent load in the affected establishment once the affected animals have been taken off. The competent authority should therefore have the obligation to check the performance of the immediate preliminary cleaning and disinfection and, when necessary, the control of insects and rodents. It is appropriate to detail the cleaning and disinfection procedure, specifying when it must be initiated and the criteria for selecting the biocidal products to be used.

(21) Article 62 of Regulation (EU) 2016/429 requires the competent authority to extend the disease control measures applied in the affected establishments to other establishments, epidemiological units therein, food and feed businesses, or animal by-products establishments or any other location of relevance, including means of transport, where epidemiological evidences give reason to suspect the spread of the category A disease to, from or through them. It is necessary to specify the traceability investigation which the competent authority must perform, under the epidemiological enquiry provided for in Regulation (EU) 2016/429, in order to properly identify those epidemiological links.

(22) It is also appropriate to detail the control measures to apply in identified linked establishments and locations. In order to be effective, those measures should be flexible and proportionate, without imposing unnecessary burdens on operators or competent authorities. The competent authorities should consequently be allowed to derogate from general provisions in exceptional circumstances, after carrying out a risk assessment.

(23) Article 64 of Regulation (EU) 2016/429 requires competent authorities to establish a restricted zone around the affected establishment when an outbreak of a category A disease is confirmed, in order to prevent any further spread of the disease. The restricted zone may include a protection zone and a surveillance zone. It is appropriate to set supplementary rules on how to establish and modify, if necessary, the restricted zone, including details on the protection zone, on the surveillance zone and on the possibility to establish further restricted zones depending on the epidemiology of the disease. It is also appropriate to provide for specific derogations for those cases where the establishment of restricted zones would not contribute to control the spreading of the disease or would impose an unjustified burden on operators and competent authorities.

(24) Article 65 of Regulation (EU) 2016/429 lists the measures that the competent authority may take in the restricted zone to prevent the spreading of the disease. In order to allow competent authorities to take the most proportionate and efficient control measures and ensure a harmonised implementation of the measures in all Member States, it is appropriate to establish detailed decision making criteria based on epidemiological circumstances, type and location of production establishments, species and categories of animals and economic or social conditions of the area affected by the disease.

(25) It is necessary to specify the prohibitions of movements of animals and products within, from or through the protection and surveillance zone and the prohibitions of other activities that can pose a risk of spreading a category A disease. Those prohibitions should be proportional to the risk of spreading the disease linked to each activity and commodity. Consequently, they need to be established taking into account the epidemiological disease profile. This is especially important in respect of prohibitions concerning products since there are certain products that should be exempted, in particular those considered safe commodities in relation to the risk of spreading certain diseases.

(26) The prohibitions of activities in the restricted zone should be limited as far as possible. For that reason, there should be the possibility for the competent authority to grant derogations from the prohibitions when certain risk-mitigating measures are taken and certain procedural conditions are met. Such derogations may be granted, in particular, when the competent authority can check the reinforcement of biosecurity measures and when general and specific conditions, related to the relevant animals, products obtained from those animals, or other substances and materials that may be contaminated, are fulfilled.

(27) Movements of ungulates should be limited to transports to a slaughterhouse. Poultry movements should be limited to the transport to slaughterhouses and to younger animals such as day-old-chicks and ready-to-lay poultry. Movements of products of animal origin should be allowed if the products have been produced before the high-risk period determined for the disease. Movements of products of animal origin and by-products produced within or after the high risk period should be allowed if the products have been subjected to specific treatments that inactivate the disease agent. Those treatments should be in line with existing Union legislation, international standards and new scientific evidence.

(28) The competent authority should be able to visit establishments and to examine animals. To prevent the further spread of the disease, requirements should be set and be met before the measures applying to the protection zone can be lifted. Once those measures are lifted, the measures applying to the surveillance zone should be implemented, for an additional period, in the area previously covered by the protection zone, to ensure that the disease is controlled.

(29) The provisions on control measures applicable within the surveillance zone should include general and specific rules for animals, products obtained from those animals, or other substances and materials that may be contaminated. They should also include derogations to allow a proportional application of the control measures. The intensity of the control measures and the derogations for their proportional application should reflect the lower risk that the surveillance zone poses for the spread of the disease but should ensure that the control measures are sufficient to avoid any risk of a further spread of the disease.

(30) The competent authority should: (i) authorise the repopulation of the affected establishments with animals; (ii) ensure that a final cleaning and disinfection of the establishment is carried out; and, if relevant, (iii) carry out a check for vectors to ensure that diseases do not reappear. The competent authority should have the flexibility needed to decide on the most appropriate repopulation measures taking into account epidemiological circumstances and specific risk mitigation conditions.

(31) Wild animals of listed species could also be affected by category A diseases. Control measures for those wild animals are essential in preventing the spread of the diseases and in ensuring their eradication. As for diseases occurring in kept animals, the competent authority should consider control measures for diseases in wild animals as part of the contingency plans provided for by the Regulation (EU) 2016/429. The control measures should apply to suspected and confirmed cases of a disease affecting wild animals within an infected zone. Measures restricting the movement of kept animals that are listed species from the infected zone should be applied with flexibility in mind, based on the epidemiological situation. This is to ensure robust control measures while avoiding unnecessary burdens for operators and competent authorities.

(32) The collection and safe disposal of dead bodies of wild animals contributes to preventing the spread of category A diseases. It is appropriate to supplement Regulation (EU) 2016/429 with rules ensuring the safe collection and disposal of animal by-products from wild terrestrial and aquatic animals affected by category A diseases or subject to restriction measures imposed in response to those diseases in line with Regulation (EC) No 1069/2009.

(33) Article 43 of Regulation (EU) 2016/429 requires the competent authority to establish an operational expert group as part of the contingency plans. These plans are designed to ensure a high level of disease awareness and preparedness and to provide a rapid response in case of an outbreak of a category A disease. The main task of the operational expert group in the case of an outbreak of diseases in terrestrial animals is to support the competent authority assessing the relevant measures for the control or eradication of the disease. The operational expert group for diseases in wild terrestrial animals should be multidisciplinary and have representatives of relevant government departments such as environmental and forests authorities, as well as stakeholders concerned, local authorities, police or other organisations that can provide advice to the competent authority on possible actions and their implementation to control or eradicate the category A disease.

(34) Council Directive 2006/88/EC ([6]) includes provisions on animal health requirements for aquaculture animals and products and on the prevention and control of certain diseases in aquatic animals. The provisions in this Delegated Regulation should be based on the provisions from previous Union legislation that have worked well and have been revised and aligned, as far as possible, with the knowledge and experience gained in the past, and updated in accordance with new evidence and international standards.

(35) Article 61 of Regulation (EU) 2016/429 provides for the application of disease control measures in establishments and other locations upon confirmation of category A diseases. One of those measures is the killing of animals that may be contaminated or may contribute to the spread of the disease. The possibility to apply such preventive killing should be detailed in this Delegated Regulation as a disease control measure aimed at reducing the infective pressure of a category A disease and to facilitate its control.

(36) Article 62 of Regulation (EU) 2016/429 includes criteria for extending the disease control measures applied in an affected establishment to epidemiologically linked establishments and locations. The analysis of the hydrodynamic and topographic conditions, including data from water catchments, barriers in watercourses or water flow conditions, allows predicting the possible passive spread of a category A disease to other establishments or locations and this prediction may contribute to minimise the impact of a category A disease. The result of such an analysis permits the implementation of better-informed disease control measures, which should avoid or minimise the spread of a category A disease from a high-risk to a disease free area.

([6]) Council Directive 2006/88/EC of 24 October 2006 on animal health requirements for aquaculture animals and products thereof, and on prevention and control of certain diseases in aquatic animals (OJ L 328, 24.11.2006, p. 14).

(37) The competent authority should be able to derogate from restrictions applicable upon confirmation of a category A disease in order to allow the use of aquaculture animals for human consumption, provided they do not show clinical signs of the disease and are processed in a way that reduces the risk of spreading the disease by infective material. The derogation should be aimed at reducing economic losses while minimising the risk of the disease spreading.

(38) Article 37 of Regulation (EU) 2016/429 provides for the recognition of a disease-free status of compartments for listed diseases. Compartments include different establishments with common and efficient biosecurity systems permitting those establishments to have a distinct animal health status. Therefore, if a category A disease is suspected or confirmed in an aquaculture establishment within a compartment, the disease control measures should be extended to other establishments within that compartment resulting in a more efficient control of the disease.

(39) Fallowing for aquatic animals is a disease control measure already included in previous Union legislation on prevention and control of diseases in aquaculture animals and should continue to be applied. The main objective of fallowing is to prevent or minimise the risk of re-infection of establishments with the category A disease, after cleaning and disinfection has been completed, and before introducing a new population of aquatic animals. Synchronous fallowing in areas with multiple infected establishments strengthens the disease control measures and contributes to a higher success rate. Different fallowing periods should be established for different category A diseases to reduce the fallowing time to a minimum while ensuring the effectiveness of this disease control measure.

(40) When an aquaculture establishment has been affected by a category A disease which does not pose a risk to human health, the placing on the marked of products from that establishment should be allowed after risk-mitigating measures have been taken. For fish, those measures should include slaughtering and evisceration. Crustaceans should be processed to non-viable products before they are dispatched. The products should be used for direct human consumption or undergo further processing in an establishment approved under Article 179 of Regulation (EU) 2016/429. Those measures are effective in controlling and avoiding the further spread of the disease while allowing those products to be used for human consumption rather than unnecessarily wasted.

(41) Article 64 of Regulation (EU) 2016/429 provides that, when a category A disease breaks out in aquatic animals, restricted zones be established as an effective measure to control the disease. Restricted zones may include a protection zone around establishments that have an increased risk of being affected by a category A disease. To ensure an effective disease control and to prevent the further spread of the disease, the introduction of aquaculture animals for farming in establishments located in the protection zone should be prohibited. To avoid re-infection, the protection zone should to be maintained until the infected aquaculture establishments are emptied of animals, cleaned and disinfected and the fallowing period has been completed.

(42) Control measures applied in a protection zone established for disease in aquatic animals should be lifted only if a series of conditions are met. Those conditions should include depopulation, cleaning, disinfection and fallowing of the affected establishments. Furthermore, the results of regular visits carried out in all establishments located in the protection zone must be satisfactory. When all those conditions are met, the protection zone should become a surveillance zone. That surveillance zone should be maintained until the surveillance period for the relevant category A disease has elapsed and there are no elements to suspect the presence of the disease.

(43) Article 43 of Regulation (EU) 2016/429 requires the competent authority to establish an operational expert group as part of the contingency plans designed to ensure a high level of disease awareness and preparedness and to provide a rapid response in case of an outbreak of a category A disease. The main task of the operational expert group in the case of an outbreak of diseases in aquatic animals is to support the competent authority in assessing the relevant measures for the control or eradication of the disease. The operational expert group for diseases in wild aquatic animals should be multidisciplinary and include representatives of government departments such as environmental and fisheries authorities, as well as stakeholders concerned, local authorities, police or other organisations that can provide advice to the competent authority on possible actions to control or eradicate the category A disease.

(44) Article 6 of Regulation (EC) No 1069/2009 provides for the implementation of general health restrictions in the case of a serious transmissible disease. When a category A disease is present in aquaculture animals, the competent authority may impose stricter rules for animal by-products originating from certain establishments. Those rules are intended to deal with situations where public health restrictions may not address the animal health risk. It is necessary, in particular, that animal by-products from such establishments must be processed or disposed of as category 2 material in compliance with Article 13 of Regulation (EC) No 1069/2009.

(45) Article 270 of Regulation (EU) 2016/429 repealed Council Directives 92/66/EEC ([7]), 2001/89/EC ([8]), 2002/60/EC ([9]), 2003/85/EC ([10]) and 2005/94/EC ([11]), which contained rules for the control of animal diseases. Article 272 of Regulation (EU) 2016/429 provides that the repealed Directives continue to apply for three years after the date of application of that Regulation or an earlier date to be determined by the Commission in a delegated act. In order to ensure a harmonised and simplified approach across species and diseases, this Regulation should apply from the date of application of Regulation (EU) 2016/429 and the repealed Directives should cease to apply from the same date,

HAS ADOPTED THIS REGULATION:

PART I

GENERAL PROVISIONS

Article 1

Subject matter and scope

This Regulation supplements the rules on disease awareness, preparedness and control to be applied with regard to the listed diseases referred to in Article 9(1)(a), (b) and (c) of Regulation (EU) 2016/429.

Those rules cover the following:

(a) Part II covers kept and wild terrestrial animals, and in particular:

(i) Chapter I lays down supplementing rules on disease control measures in the event of suspicion and official confirmation of a category A disease in kept animals as referred to in Articles 53, 54, 55, 58 and 63 of Regulation (EU) 2016/429;

(ii) Chapter II lays down supplementing rules regarding the establishment of restricted zones in the event of official confirmation of a category A disease in kept animals as referred to in Article 64 and 67 of Regulation (EU) 2016/429;

(iii) Chapter III lays down supplementing rules regarding the repopulation of the restricted zone with kept animals in the event of official confirmation of a category A disease as referred to in Articles 63 and 68 of Regulation (EU) 2016/429;

(iv) Chapter IV lays down supplementing rules regarding disease control measures in the event of suspicion and official confirmation of a category A disease in wild animals as referred to in Article 70 of Regulation (EU) 2016/429;

(v) Chapter V lays down supplementing rules on disease control measures in the event of suspicion and official confirmation of category B and C diseases in terrestrial animals as referred to in Article 74 and 77 of Regulation (EU) 2016/429;

(b) Part III covers kept and wild aquatic animals, and in particular:

(i) Chapter I lays down supplementing rules on disease control measures in the event of suspicion and official confirmation of a category A disease in aquatic animals as referred to in Articles 53, 54, 55, 58 and 63 of Regulation (EU) 2016/429;

([7]) Council Directive 92/66/EEC of 14 July 1992 introducing Community measures for the control of Newcastle disease (OJ L 260, 5.9.1992, p. 1).
([8]) Council Directive 2001/89/EC of 23 October 2001 on Community measures for the control of classical swine fever (OJ L 316, 1.12.2001, p. 5).
([9]) Council Directive 2002/60/EC of 27 June 2002 laying down specific provisions for the control of African swine fever and amending Directive 92/119/EEC as regards Teschen disease and African swine fever (OJ L 192, 20.7.2002, p. 27).
([10]) Council Directive 2003/85/EC of 29 of September 2003 on Community measures for the control of foot-and-mouth disease repealing Directive 85/511/EEC and Decisions 89/531/EEC and 91/665/EEC and amending Directive 92/46/EEC (OJ L 306, 22.11.2003, p. 1).
([11]) Council Directive 2005/94/EC of 20 December 2005 on Community measures for the control of avian influenza and repealing Directive 92/40/EEC (OJ L 10, 14.1.2006, p. 16).

(ii) Chapter II lays down supplementing rules regarding the establishment of restricted zones in the event of official confirmation of a category A disease in aquaculture animals as referred to in Article 64 and 67 of Regulation (EU) 2016/429;

(iii) Chapter III lays down supplementing rules regarding disease control measures in the event of suspicion and official confirmation of a category A disease in wild aquatic animals as referred to in Article 70 of Regulation (EU) 2016/429;

(iv) Chapter IV lays down supplementing rules on disease control measures in the event of suspicion and official confirmation of category B and C diseases in aquatic animals as referred to in Article 74 and 77 of Regulation (EU) 2016/429;

(c) Part IV covers final provisions.

Article 2

Definitions

For the purposes of this Regulation, definitions laid down in Regulation (EU) 2018/1882 and Annex I to Regulation (EC) No 853/2004 of the European Parliament and of the Council ([12]) shall apply, except where those definitions cover terms that are defined in the second paragraph of this Article.

In addition, the following definitions shall also apply:

(1) 'means of transport' means road or rail vehicle, vessels and aircrafts;

(2) 'day-old chicks' means poultry less than 72 hours old;

(3) 'semen' means the ejaculate of an animal or animals, either in the unaltered state or prepared or diluted;

(4) 'oocytes' means the haploid stages of the ootidogenesis including secondary oocytes and ova;

(5) 'embryo' means the initial stage of development of an animal while it is capable of being transferred to a recipient dam;

(6) 'fresh meat' means meat, minced meat and meat preparations, including vacuum-wrapped or wrapped in a controlled atmosphere, which has not undergone any process other than chilling, freezing or quick-freezing;

(7) 'carcass of an ungulate' means the whole body of a slaughtered or killed ungulate after:

— bleeding, in the case of slaughtered animals,

— evisceration,

— removal of the limbs at the carpus and tarsus,

— removal of the tail, the udder, the head and the skin, except in porcine animals;

(8) 'offal' means fresh meat other than that of the carcass as defined in (7), even if it remains naturally connected to the carcass;

(9) 'meat products' means processed products, including treated stomachs, bladders, intestines, rendered fats, meat extracts and blood products, resulting from the processing of meat or from the further processing of such processed products, so that the cut surface shows that the product no longer has the characteristics of fresh meat;

(10) 'casings' means the bladders and intestines that after cleaning have been processed by tissue scraping, defatting and washing and have been dried after salting;

(11) 'colostrum' means the fluid secreted by the mammary glands of kept animals up to five days post parturition that is rich in antibodies and minerals, and precedes the production of raw milk.

(12) 'colostrum-based products' means processed products resulting from the processing of colostrum or from the further processing of such processed products;

(13) 'safe commodity' means a commodity that can be moved without the need for risk mitigation measures specifically directed against a particular listed disease regardless of the status of the Member State or zone of origin for that disease;

([12]) Regulation (EC) No 853/2004 of the European Parliament and of the Council of 29 April 2004 laying down specific hygiene rules for food of animal origin (OJ L 139, 30.4.2004, p. 55).

(14) 'supply chain' means an integrated production chain of a common health status as regards listed diseases consisting of a collaborative network of specialised establishments approved by the competent authority for the purpose of Article 45, between which animals are moved to complete the production cycle;

(15) 'infected zone' means a zone in which restrictions on the movements of kept and wild animals or products and other disease control and biosecurity measures may be applied with the view to preventing the spread of a category A disease in the event of official confirmation of the disease in wild animals.

Article 3

Clinical examinations, sampling procedures and diagnostic methods

1. Where clinical examinations of animals are required pursuant to this Regulation in order to confirm or rule out the presence of a category A disease, the competent authority shall ensure that:

(a) the sampling of animals for clinical examination is carried out in accordance with:

(i) point A.1 of Annex I for terrestrial animals; and

(ii) point 1 of Annex XII for aquatic animals;

(b) the clinical examination comprises:

(i) an initial general evaluation of the animal health status of the establishment which comprises all the animals of listed species kept in the establishment; and

(ii) an individual examination of the animals included in the sample referred to in point (a).

2. Where laboratory examinations are required pursuant to this Regulation in order to confirm or rule out the presence of a category A disease, the competent authority shall ensure that:

(a) the sampling of animals for laboratory examination is carried out in accordance with:

(i) point A.2 of Annex I for terrestrial animals; and

(ii) point 1(b), (c), (d) and (e) of Annex XII for aquatic animals;

(b) the diagnostic methods for laboratory examinations fulfil the requirements set out in:

(i) point B of Annex I for terrestrial animals; and

(ii) point 2 of Annex XII for aquatic animals;

(c) the samples are sent:

(i) without delay to an official laboratory designated in accordance with Article 37 of Regulation (EU) 2017/625 of the European Parliament and of the Council ([13]);

(ii) in accordance with point C of Annex I for terrestrial animals and point 1(f) of Annex XII for aquatic animals; and

(iii) following any other instruction from the competent authority and from the laboratory regarding biosecurity and biosafety conditions to prevent the spread of category A disease agents;

(d) in the case of kept animals:

(i) an inventory of all kept animals on the establishment and their species and categories is compiled; for poultry and aquaculture animals the number of animals may be estimated; and

(ii) an identification mark of each sampled animal of listed species, or in the case of poultry and aquaculture animals the batch number, is recorded.

([13]) Regulation (EU) 2017/625 of the European Parliament and of the Council of 15 March 2017 on official controls and other official activities performed to ensure the application of food and feed law, rules on animal health and welfare, plant health and plant protection products (OJ L 95, 7.4.2017, p. 1).

Article 4

Contingency plans

The competent authority shall implement the measures laid down in this Regulation in accordance with the contingency plan referred to in Article 43 of Regulation (EU) 2016/429.

PART II

TERRESTRIAL ANIMALS

CHAPTER I

Disease control measures for category A diseases in kept terrestrial animals

Section 1

Preliminary disease control measures in the event of suspicion of a category A disease in kept animals

Article 5

Obligations on operators in the event of suspicion of a category A disease in kept animals in an establishment

In the event of suspicion of a category A disease in kept animals, operators shall take the following disease control measures in order to prevent the spread of the category A disease from the affected animals and establishments under their responsibility to other unaffected animals or to humans until the competent authority rules out the presence of the category A disease:

(a) isolate all animals suspected of being infected with the category A disease;

(b) keep the manure, including litter and used bedding, and any product, material or substance likely to be contaminated with and to transmit category A diseases isolated and protected from insects and rodents, kept animals of non-listed species and wild animals to the extent technically and practically feasible;

(c) implement the appropriate additional biosecurity measures to avoid any risk of spread of the category A disease;

(d) cease all movements of kept animals of listed species from or to the establishment;

(e) prevent non-essential movements of animals of non-listed species, products, materials, substances, persons and means of transport from or to the establishment;

(f) ensure that production, health and traceability records of the establishment are updated;

(g) provide the competent authority, on its request, with any relevant information regarding the category A disease; and

(h) follow any instructions given by the competent authority regarding the control of the category A disease, in accordance with Regulation (EU) 2016/429 and this Regulation.

Article 6

Investigation by the competent authority in the event of suspicion of a category A disease in kept animals in an establishment

1. In the event of suspicion of a category A disease in kept animals in an establishment, in accordance with Article 9(1), (3) and (4) of Delegated Regulation (EU) 2020/689, the competent authority shall immediately conduct an investigation to confirm or rule out the presence of the suspected listed disease.

2. In the course of the investigation referred to in paragraph 1 the competent authority shall ensure that official veterinarians perform at least:

(a) clinical examinations of kept animals of listed species at the establishment; and

(b) collection of samples for laboratory examinations.

Article 7

Preliminary restriction and biosecurity measures in the event of suspicion of a category A disease in kept animals in an establishment

1. In the event of suspicion of a category A disease in an establishment, the competent authority shall place the establishment under official surveillance and immediately impose the following preliminary restriction and biosecurity measures, in order to prevent the spread of the category A disease from the affected animals and the establishment to other unaffected animals or to humans:

(a) prohibition of movements of kept animals of listed species into and from the establishment;

(b) prohibition of movements of kept animals of non-listed species into and from the establishment;

(c) prohibition of movements of any product, material or substance likely to be contaminated with or likely to transmit category A diseases from the establishment;

(d) isolation of kept animals of listed species and protection from wild animals, animals of non-listed species and, when necessary, from insects and rodents;

(e) prohibition of killing of animals of listed species, unless authorised by the competent authority; and

(f) prohibition of non-essential movements of products, materials, substances, persons and means of transport into the establishments.

2. By way of derogation from point 1(a), (b) and (c) the competent authority may authorise movements of animals and products from the establishment where a category A disease is suspected, after carrying out a risk assessment and provided that:

(a) the movements of animals and products comply with all conditions and biosecurity measures necessary in order to avoid the spread of the disease;

(b) in the establishment of destination there are not other kept animals of listed species; and

(c) the establishment of destination is not a slaughterhouse.

3. Where derogations provided for in paragraph 2 are granted, the competent authority may impose the disease control measures provided for in paragraph 1 in the establishment of destination.

4. The competent authority may order preventive killing, in accordance with Article 12(1) and (2), of animals of listed species in the establishment where a category A disease is suspected when the epidemiological situation so requires.

5. All animal by-products from dead animals, which have died or have been killed in the establishment where a category A disease is suspected shall be processed or disposed of in accordance with Regulation (EC) No 1069/2009 to ensure that the suspected disease agent is inactivated and to prevent the spread of the disease to unaffected animals or to humans.

Article 8

Inventory and records analysis in the event of suspicion of a category A disease in kept animals in an establishment

1. In the event of suspicion of a category A disease, the competent authority shall order and verify that, without delay, operators of the establishments where a category A disease is suspected compile and maintain an up-to-date inventory of the following:

(a) the species, categories and number of animals kept on the establishment; for poultry, the number of animals may be estimated;

(b) the individual identification number of all the animals of species for which the individual identification is compulsory in accordance with Commission Delegated Regulation (EU) 2019/2035 ([14]);

(c) the species, categories and number of kept animals of listed species which have been born, died, showed clinical signs or are likely to be infected or contaminated with the category A disease in the establishment;

(d) any product, material or substance likely to be contaminated with or likely to transmit the relevant category A disease in the establishment; and

(e) when relevant, all places likely to enable the survival of the vectors of the relevant category A disease in the establishment.

2. Where the establishment consists of several epidemiological units, the information in paragraph 1 shall be specified for each epidemiological unit.

3. In the framework of the epidemiological enquiry, as referred to in Article 57 of Regulation (EU) 2016/429, the competent authority shall analyse at least the following records of the establishment where a category A disease is suspected:

(a) the inventory referred to in paragraph 1;

(b) the records concerning the origin and date of arrival and departure at or from the establishment of kept animals of listed species;

(c) the records concerning the origin and date of arrival and departure at or from the establishment of other relevant transport movements;

(d) the production records; and

(e) the records concerning to visits to the establishment, if available.

4. The records analysis referred to in paragraph 3 shall cover, at least, the monitoring period set out in Annex II for the relevant disease, calculated backwards from the date on which the suspicion was notified.

Article 9

Temporary restricted zones in the event of suspicion of a category A disease in kept terrestrial animals in an establishment

1. In the event of suspicion of a category A disease in kept animals in an establishment, the competent authority may establish a temporary restricted zone taking into account the following circumstances:

(a) the location of the establishment in an area with a high density of kept animals of listed species for which a category A disease is suspected;

(b) the movement of animals or persons in contact with kept animals of listed species for which a category A disease is suspected;

(c) the delay in confirming the category A disease pursuant to Article 11;

(d) the insufficient information on the possible origin and routes of introduction of the suspected category A disease; and

(e) the disease profile, in particular the routes and speed of transmission of the disease and the persistence of the disease in the animal population.

2. In the establishments within the temporary restricted zone the competent authority shall apply at least the measures provided for in Article 7.

3. The competent authority may maintain the temporary restricted zone until the moment that the presence of the category A disease has been ruled out in the establishment where it was suspected or the presence of that disease has been confirmed and a restricted zone is established pursuant to Article 21.

([14]) Commission Delegated Regulation (EU) 2019/2035 of 28 June 2019 supplementing Regulation (EU) 2016/429 of the European Parliament and of the Council as regards rules for establishments keeping terrestrial animals and hatcheries, and the traceability of certain kept terrestrial animals and hatching eggs (OJ L 314, 5.12.2019, p. 115).

4. The competent authority may order preventive killing, in accordance with Article 12(1) and (2), or slaughtering of animals of listed species, in the temporary restricted zones when the epidemiological situation so requires.

Article 10

Measures to apply in the event of suspicion of a category A disease in food and feed businesses, border control posts, animal by-products establishments or any other location of relevance, including means of transport

1. In the event of suspicion of a category A disease in accordance with Article 9(1), (3) and (4) of Delegated Regulation (EU) 2020/689 in food and feed businesses, border control posts, animal by-products establishments or any other location of relevance, including means of transport, the competent authority shall apply:

(a) the relevant provisions laid down in Articles 5 to 9; and

(b) if needed, additional measures adapted to the specific situation in order to prevent the spread of the category A disease to unaffected animals or to humans.

2. The competent authority shall also apply provisions laid down in Articles 5 to 9 in the establishments of origin of the animals or products present in the establishments and locations referred to in paragraph 1 which are suspected to be infected.

Section 2

Disease control measures in the event of the official confirmation of a category A disease in kept animals

Article 11

Official confirmation of a category A disease in kept terrestrial animals

The competent authority shall officially confirm an outbreak of a category A disease in kept terrestrial animals when a case is confirmed in accordance with Article 9(2), (3) and (4) of Delegated Regulation (EU) 2020/689.

Article 12

Disease control measures in the event of official confirmation of an outbreak of a category A disease in kept animals in an establishment

1. Following the official confirmation of an outbreak of a category A disease in an establishment in accordance with Article 11, the competent authority shall order that, in addition to measures provided for in Article 7, the following disease control measures are immediately applied under the supervision of official veterinarians:

(a) all animals of listed species kept in the affected establishment shall be killed as soon as possible on the spot, within the establishment, in such a way as to avoid any risk of spreading the relevant category A disease agent during and after killing;

(b) all appropriate and necessary biosecurity measures shall be taken to avoid any possible spread of the category A disease to unaffected kept or wild animals or to humans;

(c) bodies or parts of kept animals of listed species which have died or which have been killed pursuant to point (a) of this paragraph shall be disposed of in accordance with Regulation (EC) No 1069/2009;

(d) all potentially contaminated products, materials or substances present in the establishment shall be isolated until:

(i) they are disposed of or processed in accordance with Regulation (EC) No 1069/2009, in the case of animal by-products (including those resulting from the killing and products of animal origin and germinal products);

(ii) cleaning and disinfection measures are completed in accordance with the Article 15, in the case of other materials and substances fit for cleaning and disinfection;

(iii) disposal is completed under the supervision of official veterinarians, in the case of feeding stuff and other materials unfit for cleaning and disinfection.

2. The competent authority shall order and supervise that:

(a) the transport from the affected establishment of animal by-products referred to in paragraphs 1(c) and 1(d)(i) complies with the provisions of Regulation (EC) No 1069/2009;

(b) the transport from the affected establishment of materials or substances referred to in paragraph 1(d)(iii) complies with its instructions regarding biosecurity and biosafety conditions to prevent the spread of category A disease agent.

3. The competent authority shall collect samples for laboratory examination from kept animals of listed species, before or when they are killed or dead, for the purposes of the epidemiological enquiry referred to in Article 57 of Regulation (EU) 2016/429.

4. By way of derogation of point (a) of paragraph 1, the competent authority may, after carrying out a risk assessment and taking into account the possibility of applying other risk-mitigating measures, decide:

(a) to order the killing of kept animals of listed species at the nearest suitable place in such a way as to avoid any risk of spreading the category A disease during killing or transport; or

(b) postpone the killing of kept animals of listed species, provided that those animals are subject to emergency vaccination as provided for in Article 69 of Regulation (EU) 2016/429.

Article 13

Specific derogations from Article 12(1)(a)

1. In the event of an outbreak of a category A disease in establishments keeping animals of listed species in two or more epidemiological units, the competent authority may grant derogation from Article 12(1)(a) to the epidemiological units in which the disease has not been confirmed, after carrying out a risk assessment, and, when necessary, after obtaining favourable results in laboratory examinations, and provided that:

(a) the epidemiological enquiry referred to in Article 57 of Regulation (EU) 2016/429 has not revealed any epidemiological link between the epidemiological units in which the category A disease has been confirmed and those in which the disease has not been confirmed, to suspect the spread of the category A disease between them; and

(b) the competent authority has confirmed that, at least during the monitoring period, set out in Annex II for the relevant disease, before the confirmation of the category A disease, the epidemiological units in which the disease has not been confirmed were kept completely separated and handled by different personnel.

2. The competent authority may grant derogation from Article 12(1)(a) to the following categories of animals provided that the conditions in paragraph 3 are fulfilled:

(a) animals kept in a confined establishment;

(b) animals kept for scientific purposes or purposes related to conservation of protected or endangered species;

(c) animals officially registered in advance as rare breeds; and

(d) animals with a duly justified high genetic, cultural or educational value.

3. The competent authority shall ensure that the following conditions are fulfilled when granting the derogation provided for in paragraph 2:

(a) the competent authority has carried out an assessment of the effects of granting such derogation and, in particular, of the effects on the animal health status of the Member State concerned and of the adjacent countries and the outcome of this assessment indicated that the animal health status is not endangered;

(b) appropriate biosecurity measures are applied to prevent the risk of transmission of the category A disease to unaffected kept animals or to wild animals or to humans taking into account:

(i) the disease profile; and

(ii) the affected species of animals;

(c) the animals are subject to appropriate isolation and clinical surveillance, including laboratory examinations, until the competent authority can ensure that the animals do not pose a risk of transmission of the category A disease.

4. The competent authority may grant specific derogations from Article 12(1)(a) to equine animals kept in establishments where an outbreak of the category A diseases referred to in Annex III has been confirmed under the conditions set out in that Annex.

Article 14

Additional disease control measures in the event of an outbreak of a category A disease in kept terrestrial animals in an establishment

1. The competent authority may establish, in addition to the measures provided for in Article 12, sampling procedures for kept animals of non-listed species and wild animals of listed species, based on the information obtained from the epidemiological enquiry referred to in Article 57 of the Regulation (EU) 2016/429.

2. The competent authority may, after carrying out a risk assessment of the further spread of the relevant category A disease and taking into account the possibility of applying other risk-mitigating measures, order the killing of kept animals of non-listed species and wild animals in such a way as to avoid any risk of spreading the category A disease during killing, transport and until disposal of the entire bodies or parts of the dead animals.

Article 15

Preliminary cleaning and disinfection and control of insects and rodents in the affected establishment

1. Immediately after the completion of the measures provided for in Article 12, and when relevant in Article 14, the competent authority shall order and supervise a preliminary cleaning and disinfection and, when relevant, control of insects and rodents, in the affected establishment in order to avoid spreading of the category A disease.

2. The preliminary cleaning, disinfection and control referred to in paragraph 1 shall be:

(a) performed in accordance with the procedures set out in points A and B of Annex IV using the appropriate biocidal products to ensure destruction of the relevant category A disease agent; and

(b) adequately documented.

3. When the competent authority grants one of the derogations provided for in Article 13(2) and (4), it shall order the preliminary cleaning, disinfection and the control referred to in paragraph 1 adapting the procedures referred to in point 2(a) to the specific situation without detriment to the control of spreading of the category A disease from the affected animals and affected establishments and locations to other unaffected animals or to humans.

4. In addition to the measures referred to in paragraphs 1 and 2, the competent authority shall order and supervise that the means of transport used for the transport of animals to and from the affected establishment are properly cleaned and disinfected and, where relevant, subjected to measures ensuring the control of insects and rodents.

Article 16

Derogations and special rules for the preliminary cleaning and disinfection and control of vectors

The competent authority may grant derogation to the requirement regarding cleaning and disinfection and control of insects and rodents set out in Article 15 in the case of:

(a) pastures epidemiologically linked to the affected establishment, under specific procedures to ensure effective inactivation of the relevant category A disease agent taking into account the disease profile, the type of establishment and the climatic conditions; and

(b) manure, including litter and used bedding, from the affected establishment, under specific procedures to ensure effective inactivation of the relevant category A disease agent in accordance with scientific evidence.

Article 17

Identification of epidemiologically linked establishments and other locations of relevance, including means of transport

1. In the frame of the epidemiological enquiry, as referred to in Article 57 of the Regulation (EU) 2016/429, and in order to identify all the epidemiologically linked establishments and other locations of relevance, including means of transport, the competent authority shall trace all kept animals present in the establishment where an outbreak of a category A disease has been confirmed and any products, materials, substances, means of transport or people likely to spread the relevant category A disease including:

(a) those dispatched into and from the establishment; and

(b) those that have entered into contact with the establishment.

2. The tracing referred to in paragraph 1 shall cover at least the monitoring period, set out in Annex II for the relevant disease, calculated backwards from the date the suspicion was notified.

3. After carrying out a risk assessment, the competent authority may exclude from the tracing referred to in paragraph 1 those products considered as safe commodities, as provided for in Annex VII.

Article 18

Measures to be applied in the epidemiologically linked establishments and other locations of relevance, including means of transport

1. When the tracing provided for in Article 17(1) demonstrates that animals of listed species were dispatched from or to the affected establishment during the period referred to in paragraph 2 of that Article, the competent authority shall:

(a) carry out investigations and impose restriction and biosecurity measures in accordance with Article 6, Article 7 and Article 8 in the establishments of destination or origin of the movement; or

(b) immediately extend the measures in Article 12 to the establishment of origin or the establishment of destination of the movement in the case that there is epidemiological evidence of spreading of the disease to, from or through that establishment.

2. The competent authority shall apply the measures referred to in paragraph 1 in other establishments and locations of relevance, including means of transport, likely to be contaminated as a result of contact with animals, products, materials, substances, persons or means of transport from the affected establishment identified in the frame of the tracing referred to in Article 17 or based on any other relevant information from the epidemiological enquiry, as referred to in Article 57 of the Regulation (EU) 2016/429.

Article 19

Measures to be applied to the products identified by the tracing

1. The competent authority shall order and supervise that semen, oocytes and embryos identified as contaminated by the tracing referred to in Article 17 are disposed of in accordance with Regulation (EU) No 1069/2009.

2. The competent authority shall order and supervise the treatment, processing or disposing of the products identified by the tracing referred to in Article 17, at least up to:

(a) the first food processing establishment in the case of products of animal origin;

(b) the hatchery or the establishment where eggs were sent for hatching, in the case of hatching eggs which did not yet hatch; and

(c) the first establishment of processing in the case of animal by products, except manure; or

(d) the location where it is stored, in the case of manure, including litter and used bedding.

3. The competent authority shall establish official surveillance on poultry hatched during the tracing period referred to in Article 17(2) from hatching eggs originating from the affected establishment; this surveillance shall be established in all the establishments of destination of the hatching eggs and shall be maintained for a period of time of 21 days after hatching.

4. The competent authority shall order and supervise that the transport from the establishments of animal by-products is subject to the provisions laid down in Regulation (EC) No 1069/2009.

5. The competent authority shall order and supervise that materials or substances likely to be contaminated or likely to transmit the relevant category A disease comply with its instructions regarding biosecurity and biosafety conditions to prevent the spread of category A disease agent.

Article 20

Measures to be applied in the event of official confirmation of an outbreak of a category A disease in food and feed businesses, border control posts, animal by-products establishments and any other location of relevance, including means of transport

1. In the event of official confirmation of an outbreak in accordance with Article 11 in food and feed businesses, border control posts, animal by-products establishments or any other locations of relevance, including means of transport, the competent authority shall apply:

(a) the relevant provisions laid down in Articles 12 to 19; and

(b) if needed, additional measures adapted to the specific situation in order to prevent the spread of the category A disease from the affected animals and affected establishments and locations to other unaffected animals or to humans.

2. The competent authority shall apply provisions laid down in Articles 12 to 19 also in the establishments of origin of the affected animals or products present in the establishments and locations referred to in paragraph 1.

CHAPTER II

Disease control measures for category A diseases of kept terrestrial animals in the restricted zones

Section 1

General disease control measures in the restricted zone

Article 21

Establishment of a restricted zone

1. In the event of an outbreak of a category A disease in an establishment, food and feed business, animal by–products establishment or other locations, including means of transport, the competent authority shall immediately establish around the affected establishment or location a restricted zone, which comprises:

(a) a protection zone based on the minimum radius from the outbreak set out for the relevant category A disease in Annex V;

(b) a surveillance zone based on the minimum radius from the outbreak set out for the relevant category A disease in Annex V; and

(c) if necessary, on the basis of the criteria set out in paragraph 1 of Article 64 of Regulation (EU) 2016/429, further restricted zones around or adjacent to the protection and surveillance zones, where the competent authority shall apply the same measures as those provided for in Section 3 of this Chapter for the surveillance zone.

2. The competent authority shall adapt the boundaries of the initial restricted zone, including the boundaries of the protection, surveillance and the further restricted zones, in the case of the overlapping of two or more restricted zones due to further outbreaks of the category A disease.

3. By way of derogation of paragraph 1, and after carrying out a risk assessment taking into account the disease profile, the competent authority may not establish a restricted zone when an outbreak of a category A disease occurs in the following locations:

(a) establishments keeping animals referred to Article 13(2);

(b) hatcheries;

(c) food and feed businesses, border control posts, animal by-products establishments;

(d) means of transport;

(e) locations where assembly operations or temporal exhibition or veterinary assistance of animals take place; and

(f) any other location which is not an establishment.

Article 22

Measures to be applied in the restricted zone

1. The competent authority shall without delay compile and keep up to date an inventory of all establishments keeping animals of listed species located in the restricted zone including the species, categories and number of animals in each establishment; for poultry, the number of animals may be estimated.

2. The competent authority may, in order to prevent the spreading of the disease and based on epidemiological information or other evidence, implement preventive killing, in accordance with Article 12(1) and (2), or slaughtering of kept animals of listed species in the establishments located in the restricted zone.

3. The competent authority shall order and supervise that all movements of entire bodies or parts of dead wild and kept animals of listed species from the restricted zone are destined for processing or disposal in accordance with Regulation (EC) No 1069/2009 in a plant approved for those purposes:

(a) within the territory of the Member State; or

(b) in another Member State in accordance with Article 48(1) and (3) of Regulation (EC) No 1069/2009, where it is not feasible to process or dispose the entire bodies or parts of dead animals in an approved plant in the territory of the Member State where the outbreak occurred.

4. The competent authority shall impose specific conditions for the transport of animals and products through the restricted zone in order to ensure that they are performed:

(a) without stopping or unloading in the restricted zone;

(b) prioritising major highways or mainline railways; and

(c) avoiding the vicinity of establishments keeping animals of listed species.

5. Animal by-products originating from and moved outside the restricted zone shall be accompanied by an animal health certificate issued by an official veterinarian stating that they are allowed to be moved from the restricted zone under the conditions established by the competent authority in accordance with this Chapter.

6. The competent authority may decide that the certificate referred to in paragraph 5 shall not be issued for movements of animal by-products within the Member State concerned when that authority considers that an alternative system is in place ensuring that consignments of such products are traceable and that products fulfil the animal health requirements for such movements.

7. Any collection of samples in the establishments in the restricted zone keeping animals of listed species for purposes other than to confirm or rule out the presence of the relevant category A diseases must be authorised by the competent authority.

Article 23

Derogations from measures to be applied in the restricted zone

The competent authority may grant derogations from the provisions set out in this Chapter concerning the measures to be applied in restricted zones, to the extent necessary and after carrying out a risk assessment:

(a) in the further restricted zones referred to in Article 21(1)(c);

(b) in the case that the competent authority decides to establish a restricted zone when an outbreak of a category A disease occurs in establishments and locations referred to in Article 21(3);

(c) in the case that the outbreak occurs in an establishment keeping up to 50 captive birds; or

(d) in establishments and locations referred to in Article 21(3) located in a restricted zone.

Article 24

Requirements for the means of transport of kept animals of listed species and products thereof

1. The competent authority shall ensure that the means of transport used for movements of kept animals of listed species and products thereof within, from, to and through the restricted zone have been:

(a) constructed and maintained in such a way to avoid any leakage or escape of animals, products or any item representing an animal health risk;

(b) cleaned and disinfected immediately after every transport of animals, products or any item representing an animal health risk and, if necessary, subsequently disinfected again, and in any case dried or allowed to dry, before any new loading of animals or products; and

(c) where relevant, subjected to measures for the control of insects and rodents before the transport.

2. The cleaning and disinfection of the means of transport referred to in paragraph 1 shall be performed:

(a) in accordance with the instructions or procedures provided for by the competent authority using the appropriate biocidal products to ensure the destruction of the relevant category A disease agent; and

(b) adequately documented.

Section 2

Disease control measures in the protection zone

Article 25

Measures to be applied in establishments keeping animals of listed species in the protection zone

1. The competent authority shall order without delay the application of the following measures in establishments in the protection zone keeping animals of listed species, other than the establishment in which the category A disease has been confirmed:

(a) to keep animals of listed species separate from wild animals and animals of non-listed species;

(b) to implement additional surveillance in order to identify any further spread of the category A disease to the establishments, including any increased morbidity or mortality or significant drop in production data; any such increase or drop shall be immediately notified to the competent authority;

(c) when appropriate, to implement adequate means of controlling insects and rodents and other disease vectors in and around the establishment;

(d) to use appropriate means of disinfection at the entrances and exits of the establishment;

(e) to apply appropriate biosecurity measures to all persons in contact with kept animals of listed species or entering or leaving the establishment as well as to means of transport in order to avoid any risk of spread of the relevant category A disease;

(f) to keep records of all persons visiting the establishment, maintain them up to date in order to facilitate disease surveillance and control and made them available to the competent authority upon request;

(g) to dispose entire bodies or parts of dead or killed kept animals of listed species according to Article 22(3).

2. By way of derogation of point (f) of paragraph 1 the records on visitors are not required in establishments where animals referred to in Article 13(2) are kept, if visitors have no access to the areas where the animals are kept.

Article 26

Visits by official veterinarians in establishments in the protection zone

1. The competent authority shall ensure that official veterinarians carry out at least one visit to all the establishments referred to in Article 25, as soon as possible and without unjustified delay, after the official confirmation of an outbreak of a category A disease.

2. When carrying out the visits referred to in paragraph 1, official veterinarians shall perform at least the following activities:

(a) documentary checks, including production, health and traceability records analysis;

(b) verification of the implementation of the measures applied to prevent the introduction or spread of the relevant category A disease in accordance with Article 25;

(c) clinical examination of kept animals of listed species; and

(d) if necessary, collection of samples of animals for laboratory examination in order to confirm or rule out the presence of the relevant category A disease.

3. The competent authority may require further veterinary visits to the establishments in the protection zone to follow up on the situation.

4. The competent authority shall keep a record of activities and visits referred to in paragraph 1, 2 and 3 and the findings thereof.

5. By way of derogation from paragraph 1, where the radius of the protection zone set in Annex V is larger than 3 km, the competent authority may decide to require not the visit to all the establishments referred to in Article 25 but the visit of a representative number of those establishments in accordance with point A.3 of Annex I.

Article 27

Prohibitions in relation to activities, including movements, concerning animals, products and other material within, from or to the protection zone

1. The competent authority shall prohibit the activities, including movements, concerning animals of listed species and their products and other materials within, from and to the protection zone in accordance with the table in Annex VI.

2. The competent authority may extend the prohibitions provided for in paragraph 1 to:

(a) animals of non-listed species and products from such animals; and

(b) activities, including movements, other than those set out in Annex VI.

3. The following products are exempted from prohibitions provided for in paragraphs 1 and 2:

(a) products of animal origin considered as safe commodities, in accordance with Annex VII, as regards the relevant disease;

(b) products of animal origin which have undergone the relevant treatment in accordance with Annex VII;

(c) products or other materials likely to spread the disease obtained or produced before the monitoring period set out in Annex II for the relevant disease calculated backwards from the date on which the suspicion was notified;

(d) products produced in the protection zone which have been obtained from kept animals of listed species:

(i) kept outside the protection zone;

(ii) kept and slaughtered outside the protection zone; or

(iii) kept outside the protection zone and slaughtered in the protection zone;

(e) derived products.

4. Prohibitions provided for in paragraph 1 and 2 shall apply to products referred to in paragraph 3 if:

(a) the products were not clearly separated, during the production process, storage and transport, from products not eligible for dispatch outside the restricted zone pursuant to this Regulation; or

(b) the competent authority has epidemiological evidences of spreading of the disease to, from or through those products.

Article 28

General conditions to grant derogations from prohibitions in the protection zone

1. By way of derogation from prohibitions provided for in Article 27, the competent authority may authorise movements of animals and products in the cases covered by Articles 29 to 38 and under the specific conditions provided for in those Articles and the general conditions laid down in paragraphs 2 to 7 of this Article.

Prior to granting the authorisation, the competent authority shall assess the risks deriving from that authorisation and the assessment must indicate that the risk of spreading the category A disease is negligible.

2. All authorised movements must be performed:

(a) exclusively via designated routes,

(b) prioritising major highways or mainline railways,

(c) avoiding the vicinity of establishments keeping animals of listed species; and

(d) without unloading or stopping, until the unloading in the establishment of destination.

3. The competent authority of the establishment of origin shall designate the establishment of destination for movements from or to the protection zone. If the competent authority of the establishment of origin is different from the competent authority of the establishment of destination, it shall inform the competent authority of the establishment of destination about such designation.

4. The competent authority of the establishment of origin shall verify that the establishment of destination agrees to be designated and to receive each consignment of animals or products.

5. When authorising movements of animals from the protection zone, the competent authority shall ensure that such movements do not pose a risk of spreading of the category A disease based on:

(a) a clinical examination, with favourable results, of animals kept in the establishment, including those animals to be moved;

(b) if necessary, a laboratory examination, with favourable results, of animals kept in the establishment, including those animals to be moved; and

(c) the outcome of the visits referred to in Article 26.

6. When authorising the transport of products from the protection zone, the competent authority shall order and supervise that:

(a) during the whole production process and their storage, products were clearly separated from products not eligible for dispatch outside the restricted zone in accordance with this Regulation; and

(b) products will not be transported with products not eligible for dispatch outside the restricted zone pursuant to this Regulation.

7. When granting an authorisation pursuant to paragraph 1, the competent authority shall ensure that supplementary biosecurity measures are applied from the moment of loading, during all transport operations and until the unloading in the designated establishment of destination in accordance with its instructions.

Article 29

Specific conditions for authorising movements for slaughter of kept animals of listed species in the protection zone

1. The competent authority may authorise movements of kept animals of listed species from establishments located in the protection zone to a slaughterhouse located:

(a) as near as possible to the establishment of origin, within the protection zone;

(b) in the surveillance zone, when it is not possible to slaughter the animals in the protection zone; or

(c) as near as possible to the surveillance zone when it is not possible to slaughter the animals in the restricted zone.

2. The competent authority shall only grant authorisations provided for in paragraph 1 under the following conditions:

(a) the means of transport must be sealed at the moment of loading by the competent authority of dispatch or under its supervision;

(b) the competent authority of the slaughterhouse shall:

(i) be informed in advance by the slaughterhouse operator of the intention to receive kept animals of listed species;

(ii) confirm the absence of any signs indicative of the category A disease during the *ante* and *post mortem* inspections;

(iii) supervise the slaughterhouse operator having effective procedures in place to ensure that kept animals of listed species originating in the protection zone are kept separately and slaughtered separately from such animals or at different times, preferably at the end of the working day of arrival;

(iv) confirm the slaughter of the animals to the competent authority of the establishment of origin of the animals;

(v) supervise the slaughterhouse operator cleaning and disinfecting the premises where the animals have been kept and slaughtered and the completion of the cleaning and disinfection is completed before other kept animals of listed species are kept or slaughtered in those premises; and

(vi) supervise the obtaining of meat from such animals complying with the conditions laid down in Article 33.

3. The competent authority may authorise movements of kept animals of listed species from establishments located outside the protection zone to a slaughterhouse located in the protection zone if:

(a) the animals are kept separately from other animals originating from the protection zone and are slaughtered separately from those animals or at a different time;

(b) the fresh meat obtained is cut, transported and stored separately from fresh meat obtained from animals originating in the protection zone; and

(c) the cleaning and disinfection of the means of transport referred to in Article 24 takes place under official supervision after unloading the animals.

4. By way of derogation of Article 9 of Regulation (EC) No 1069/2009 the competent authority may authorise the processing and use of animal by-products, obtained from animals slaughtered in accordance with paragraphs 1, 2 and 3 as category 3 material in accordance with Regulation (EC) No 1069/2009 in a plant approved for processing or disposal of animal by-products, located on its territory, or in another Member State, where it is not feasible to process or dispose them in an approved plant in the territory of the Member State where the outbreak occurred.

In case the animal by-products referred to in the first subparagraph are moved to a plant located in another Member State, the Member State of destination and the Member States of passage shall authorise such dispatch and the competent authority of destination shall authorise the processing and use of those animal by-products as category 3 material in accordance with Regulation (EC) No 1069/2009.

Article 30

Specific conditions for authorising certain movements of poultry from establishments located in the protection zone

1. The competent authority may authorise movements of day-old-chicks from an establishment located in the protection zone to an establishment located in the same Member State but, if possible, outside the restricted zone, provided that:

(a) in the case of day-old-chicks hatched from eggs originating in the restricted zone:

(i) the means of transport is sealed at the moment of loading by the competent authority or under its supervision;

(ii) the establishment of destination is placed under official surveillance by the official veterinarians following the arrival of the animals; and

(iii) if moved outside the restricted zone, the poultry remain in the establishment of destination at least for a period of 21 days.

(b) in the case of day-old-chicks hatched from eggs originating outside the restricted zone, the hatchery of dispatch can ensure that no contact has occurred between those eggs and any other hatching eggs or day-old chicks originating in the restricted zone.

2. The competent authority may authorise movements of ready-to-lay poultry from establishments located in the protection zone to establishments located in the same Member State and, if possible, within the restricted zone, provided that:

(a) in the establishment of destination there is no other kept animal of listed species;

(b) the means of transport is sealed at the moment of loading by the competent authority or under its supervision;

(c) the establishment of destination is placed under official surveillance by the official veterinarians following the arrival of the animals; and

(d) if moved outside the restricted zone, the animals remain on the establishment of destination at least for a period of 21 days.

Article 31

Specific conditions for authorising certain movements of hatching eggs in the protection zone

1. The competent authority may authorise movements of hatching eggs either:

(a) from an establishment located in the protection zone to a hatchery located in the same Member State; or

(b) from an establishment located in the same member State to a hatchery located in the protection zone.

2. The authorisation provided for in paragraph 1(a) shall be subject to the following conditions:

(a) the parent flocks from which the hatching eggs are derived have undergone a clinical examination and have been sampled for laboratory examination with favourable results;

(b) the hatching eggs and their packaging are disinfected before dispatch and the tracing back of the hatching eggs can be ensured; and

(c) the hatching eggs must be transported in means of transport sealed by the competent authority.

3. The competent authority may authorise movements of hatching eggs from an establishment located in the protection zone to an establishment for in-house hatching located in the same Member State, if:

(a) the parent flocks from which the hatching eggs are derived have undergone a clinical examination and have been sampled for laboratory examination with favourable results;

(b) the establishment of destination is placed under official supervision until 21 days following hatching of the eggs;

(c) the poultry must remain on the establishment of destination during the period referred to in (b); and

(d) the requirements referred to in paragraph 2(b) and (c) are complied with.

Article 32

Specific conditions for authorising movements of semen from approved germinal product establishments in the protection zone

The competent authority may authorise movements of semen collected from animals of listed species kept in approved germinal product establishments, excluding hatcheries, located in the protection zone after the estimated date of earliest infection of the affected establishment subject to the following conditions:

(a) all the disease control measures relating to the category A disease have been lifted in the protection zone in accordance with Article 39;

(b) all kept animals of listed species in the semen collection centre have undergone a clinical examination and have been sampled for laboratory examination in order to rule out the presence of the category A disease in the semen collection centre; and

(c) the donor animal has been subjected with favourable result to a laboratory examination on a sample taken not earlier than seven days after the monitoring period set out in Annex II for the relevant disease, calculated forwards from the date on which the semen was collected.

Article 33

Specific conditions for authorising movements of fresh meat and raw milk obtained from kept animals of listed species from establishments in the protection zone

1. The competent authority may authorise movements of fresh meat and raw milk obtained from animals of listed species kept in establishments located in the protection zone if:

(a) they are moved to a processing establishment to undergo one of the relevant risk-mitigating treatments set out in Annex VII; or

(b) in the case of fresh meat of poultry:

(i) it has been marked in accordance with paragraph 1 of Annex IX from the moment it was obtained in the slaughterhouse; and

(ii) it is not intended to another Member State.

2. The competent authority shall ensure that movements to a processing establishment referred to in paragraph 1(a) comply with the following conditions:

(a) fresh meat must be marked in accordance with point 2 of Annex IX in the slaughterhouse after the post-mortem inspection and must bear such mark until it is treated;

(b) the movement of fresh meat and raw milk from the establishment of origin to the processing establishment must be carried out in sealed containers; and

(c) the processing establishment must be located in the same restricted zone or as near as possible to the restricted zone and must operate under the supervision of official veterinarians.

Article 34

Specific conditions for authorising movements of eggs for human consumption from establishments located in the protection zone

The competent authority may authorise the movement of eggs for human consumption from establishments located in the protection zone to the following destinations within the same Member State:

(a) to a packing centre, provided that they are packed in:

(i) a disposable packaging; or

(ii) a packaging which can be cleaned and disinfected in such way as to destroy the relevant category A disease agent;

(b) to an establishment for the manufacture of egg products as set out in Chapter II of Section X of Annex III to Regulation (EC) No 853/2004, in order to be handled and treated in accordance with Chapter XI of Annex II to Regulation (EC) No 852/2004 of the European Parliament and of the Council ([15]).

Article 35

Specific conditions for authorising movements of manure, including litter and used bedding from establishments located in the protection zone to a landfill

The competent authority may authorise movements of manure, including litter and used bedding, from establishments located in the protection zone for the purpose of their disposal in a designated landfill located within the same Member State only after processing in accordance with Article 13(c) of Regulation (EU) No 1069/2009.

Article 36

Specific conditions for authorising the movement of feed materials of plant origin and straw from the protection zone

The competent authority may authorise movements of feed materials of plant origin and straw produced in the protection zone provided that:

(a) they were produced in locations not keeping animals of listed species;

(b) they were produced in feed processing establishments not keeping animals of listed species and the raw plant material originates:

(i) from locations referred to in point (a); or

(ii) from outside the protection zone;

(c) they are intended for use within the protection zone; or

(d) they have undergone at least one of the risk-mitigating treatments in accordance with Annex VIII.

Article 37

Specific conditions for authorising movements of kept animals of listed species and products to an animal by-products approved plant

1. The competent authority may authorise movements of kept animals of listed species from establishments located in the protection zone to a plant approved for processing or disposal of animal by-products in which:

(a) the kept animals are immediately killed; and

(b) the resulting animal by-products are disposed of in accordance with Regulation (EC) No 1069/2009.

([15]) Regulation (EC) No 852/2004 of the European Parliament and of the Council of 29 April 2004 on the hygiene of foodstuffs (OJ L 139, 30.4.2004, p. 1).

2. The competent authority may authorise movements of products from establishments and locations in the protection zone to a plant approved for processing or disposal of animal by-products, in which the products are disposed of or processed in accordance with Regulation (EC) No 1069/2009.

Article 38

Measures to be applied in food and feed businesses, border control posts, animal by-products establishments or any other location of relevance in the protection zone, including means of transport

1. The competent authority shall apply the relevant measures referred to in Article 25, and Articles 27 to 38 in food and feed businesses, border control posts, animal by-products establishments or any other location of relevance in the protection zone, including means of transport.

2. In the establishments and locations referred to in paragraph 1, the competent authority may apply additional measures adapted to the specific situation in order to prevent the spread of the category A disease within and from the protection zone.

Article 39

Duration of the disease control measures in the protection zone

1. The competent authority may lift the measures provided for in Section 1 and 2 of this Chapter only if the minimum period set out in Annex X has elapsed and the following conditions are fulfilled:

(a) the preliminary cleaning and disinfection and, where relevant, control of insects and rodents, has been performed in accordance with Article 15 in the affected establishment; and

(b) in all establishments keeping animals of listed species in the protection zone, animals of listed species have undergone, with favourable results, clinical and when necessary laboratory examinations in accordance with Article 26.

2. Where the relevant category A disease is transmitted by a listed vector, as referred to in Regulation (EU) 2018/1882, the competent authority may:

(a) establish the duration of the measures in the protection zone on a case by case basis, taking into account any factor influencing the risk of the disease spreading; and

(b) provide for the introduction of sentinel animals.

3. After the lifting of the measures referred to in paragraph 1, the measures provided for in Section 3 of this Chapter shall apply in the protection zone for at least the additional period set out in Annex X.

Section 3

Disease control measures in the surveillance zone

Article 40

Measures to be applied in establishments in the surveillance zone

The competent authority shall order the application, without delay, of the measures provided for in Article 25 in all the establishments in the surveillance zone keeping animals of listed species.

Article 41

Visits by the official veterinarians in establishments in the surveillance zone

The competent authority shall ensure that official veterinarians carry out visits to a sample of establishments keeping animals of listed species in the surveillance zone in accordance with Article 26 and point A.3 of Annex I.

Article 42

Prohibitions in relation to activities, including movements, concerning animals, products and other material within, from or to the surveillance zone

The competent authority shall apply prohibitions, exemptions and derogations to activities, including movements concerning animals of listed species, the products thereof and other material, from and to the surveillance zone in accordance with Article 27.

Article 43

General conditions for granting derogations from prohibitions provided for in Article 42

1. By way of derogation from Article 42, the competent authority may authorise movements of animals and products only in the cases covered by Articles 44 to 52, under the specific conditions provided for in those Articles and the general conditions laid down in paragraphs 2 to 7 of this Article.

Prior to granting the authorisation, the competent authority shall assess the risks deriving from that authorisation. The assessment must indicate that the risk of spreading the category A disease is negligible.

2. All authorised movements shall be performed:

(a) prioritising major highways or mainline railways;

(b) avoiding the vicinity of establishments keeping animals of listed species; and

(c) without unloading or stopping, until the unloading in the establishment of destination.

3. The competent authority of the establishment of origin shall designate the establishment of destination for movements from or to the surveillance zone. If the competent authority is not the same as in the establishment of destination, it shall inform the competent authority of the establishment of destination about such designation.

4. The competent authority of the establishment of origin shall verify that the establishment of destination agrees to be designated and to receive each consignment of animals or products.

5. When authorising movements of animals from the surveillance zone, the competent authority shall ensure that such movements do not pose a risk of spreading the category A disease based on:

(a) a clinical examination with favourable results of animals kept in the establishment, including those animals to be moved;

(b) if necessary, a laboratory examination with favourable results of animals kept in the establishment, including those animals to be moved; and

(c) the outcome of the visits referred to in Article 41, if available.

6. When authorising the transport of products from the surveillance zone, the competent authority must ensure that:

(a) during the whole production process and storage, products were clearly separated from products not eligible for dispatch outside the restricted zone pursuant this Regulation;

(b) products will not be transported with products not eligible for dispatch outside the restricted zone pursuant this Regulation.

7. When granting derogations provided for in paragraph 1, the competent authority shall ensure that supplementary biosecurity measures are applied from the moment of loading, during all transport operations and until the unloading in the designated establishment of destination in accordance with its instructions.

Article 44

Specific conditions for authorising movements for slaughter of kept animals of listed species within, from and to the surveillance zone

1. The competent authority may authorise movements of kept animals of listed species originating in the surveillance zone to a slaughterhouse located:

(a) as near as possible to the establishment of origin, within the restricted zone; or

(b) outside the restricted zone, as near as possible to the surveillance zone, when it is not possible to slaughter the animals in the restricted zone, and after carrying out a risk assessment.

2. The meat obtained from animals referred to in paragraph 1 shall be subject to the measures provided for in Article 49.

3. The competent authority may authorise movements of kept animals of listed species originating outside the surveillance zone to a slaughterhouse situated in the surveillance zone.

4. The competent authority may authorise the processing and use of animal by-products, obtained from animals slaughtered in accordance with paragraphs 1, 2 and 3 as category 3 material in accordance with Regulation (EC) No 1069/2009 in a plant approved for processing or disposal of animal by-products, located on their territory, or in another Member State, where it is not feasible to process or dispose them in an approved plant in the territory of the Member State where the outbreak occurred.

In case the animal by-products referred to in the first subparagraph are moved to a plant located in another Member State, the Member State of destination and the Member States of passage shall authorise such dispatch and the competent authority of destination shall authorise the processing and use of those animal by-products as category 3 material in accordance with Regulation (EC) No 1069/2009.

Article 45

Specific conditions for authorising certain movements of kept ungulates of listed species from establishments in the surveillance zone

1. The competent authority may authorise the movement of kept ungulates of listed species to pastures situated within the surveillance zone, provided that:

(a) a period of 15 days has elapsed after the preliminary cleaning and disinfection referred to in Article 15 has been completed and approved; and

(b) the animals do not come into contact with animals of listed species from other establishments.

2. The competent authority may, after carrying out a risk assessment, authorise the movement of kept animals of listed species of ungulates to an establishment belonging to the same supply chain, located in or outside the surveillance zone, to complete the production cycle before slaughter. If the establishment of destination is located outside the surveillance zone, the competent authority shall apply in that establishment the measures provided for in Articles 40, Article 41 and Article 42 as long as the disease control measures in the surveillance zone of origin are maintained as provided for in Article 55.

Article 46

Specific conditions for authorising certain movements of poultry from establishments located in the surveillance zone

1. The competent authority may authorise movements of day-old chicks originating in the surveillance zone:

(a) to establishments in the same Member State where they were hatched from eggs originating from establishments within the surveillance zone, if:

  (i) the establishment of destination is placed under official surveillance following the arrival of the animals; and

  (ii) if moved outside the restricted zone, the animals remain in the establishments of destination for at least 21 days;

(b) to establishments in the same Member State where they were hatched from eggs originating outside the restricted zone, if the hatchery of dispatch can ensure that no contact has occurred between those eggs and any other hatching eggs or day-old chicks obtained from animals kept within the restricted zone.

2. The competent authority may authorise movements of ready-to-lay poultry from establishments in the surveillance zone to establishments in the same Member State, if:

(a) in the establishment of destination there is no other kept animal of listed species;

(b) the establishment of destination is placed under official surveillance following the arrival of the ready-to-lay poultry; and

(c) the poultry remain on the establishment of destination for at least 21 days.

Article 47

Specific conditions for authorising certain movements of hatching eggs to and from establishments in the surveillance zone

1. The competent authority may authorise movements of hatching eggs from an establishment located in the same Member State to:

(a) a hatchery located in the surveillance zone; or

(b) an establishment for in-house hatching located in the surveillance zone.

2. The competent authority may authorise movements of hatching eggs from an establishment located in the surveillance zone to a hatchery in the same Member State or to an establishment for in-house hatching located in the same Member State, only if the hatching eggs and their packaging are disinfected before dispatch and the tracing back of these eggs can be ensured.

Article 48

Specific conditions for authorising movements of semen from approved germinal product establishments in the surveillance zone

The competent authority may authorise movements of semen collected from animals of listed species kept in approved germinal product establishments, excluding hatcheries, located in the surveillance zone after the estimated date of earliest infection of the affected establishment provided that:

(a) all the disease control measures relating to the relevant category A disease have been lifted in the surveillance zone in accordance with Article 55;

(b) all the kept animals of listed species in the semen collection centre have undergone a clinical examination and have been sampled for laboratory examinations in order to rule out the presence of the category A disease in the semen collection centre;

(c) the donor animal has been subjected with favourable results to a laboratory examination on a sample taken not earlier than seven days after the monitoring period set out in Annex II for the relevant disease, calculated forwards from the date on which the semen was collected.

Article 49

Specific conditions for authorising movements of fresh meat and raw milk obtained from kept animals of listed species from establishments located in the surveillance zone

1. The competent authority may authorise movements of fresh meat and raw milk obtained from animals of listed species kept in establishments located in the surveillance zone if, either:

(a) the fresh meat or the raw milk is moved to a processing establishment to undergo one of the risk-mitigating treatments set out in Annex VII; or

(b) the fresh meat is obtained from poultry.

2. The competent authority shall ensure that fresh meat and the raw milk moved pursuant paragraph 1(a), comply with the following:

(a) fresh meat is marked in accordance with Annex IX when it is obtained in the slaughterhouse and keeps such mark until it is treated; and

(b) the treatment is applied in an establishment situated in the same restricted zone or as near as possible of the restricted zone, which operates under the supervision of official veterinarians.

Article 50

Specific conditions for authorising movements of eggs for human consumption from establishments in the surveillance zone

1. The competent authority may authorise movements of eggs for human consumption from establishments in the surveillance zone to a packing centre located in the same Member State provided that they are packed in:

(a) a disposable packaging; or

(b) a packaging which can be cleaned and disinfected in such way as to destroy the category A disease agent.

2. The competent authority may authorise movements of eggs for human consumption from establishments located in the surveillance zone to an establishment for the manufacture of egg products located in the same Member State if:

(a) the establishment for the manufacture of egg products complies with Chapter II of Section X of Annex III to Regulation (EC) No 853/2004; and

(b) the eggs are moved to the establishment for the manufacture of egg products in order to be handled and treated in accordance with Chapter XI of Annex II to Regulation (EC) No 852/2004.

Article 51

Specific conditions for authorising movements of manure, including litter and used bedding, from establishments in the surveillance zone

The competent authority may authorise the movement of manure, including litter and used bedding, from establishments located in the surveillance zone:

(a) without processing, to a landfill, previously authorised for that purpose by the competent authority, located in the same surveillance zone; or

(b) following processing, to a landfill, previously authorised for that purpose by the competent authority, located in the territory in the Member State.

Article 52

Specific conditions for authorising the movement of feed materials of plant origin and straw from the surveillance zone

The competent authority may authorise movements of feed materials of plant origin or straw produced in the surveillance zone provided that the feed materials or the straw:

(a) were produced in locations not keeping animals of listed species, other than feed processing establishments;

(b) were produced in feed processing establishments not keeping animals of listed species and the raw plant material originates:

(i) from locations referred to in paragraph (a); or

(ii) from outside the surveillance zone;

(c) are intended for use within the surveillance zone;

(d) have undergone at least one of the risk-mitigating treatments set out in Annex VIII.

Article 53

Specific conditions for authorising movements of kept animals of listed species and products to an approved plant

1. The competent authority may authorise movements of kept animals of listed species from establishments located in the surveillance zone to a plant approved for processing or disposal of animal by-products where:

(a) the kept animals are immediately killed; and

(b) the resulting animal by-products are disposed of in accordance with Regulation (EC) No 1069/2009.

2. The competent authority may authorise movements of products from establishments and other locations in the surveillance zone to a plant approved for processing or disposal of animal by-products where they are disposed of or processed in accordance with Regulation (EC) No 1069/2009.

Article 54

Measures to be applied in food and feed businesses, border control posts, animal by-products establishments or any other location of relevance in the surveillance zone, including means of transport

1. The competent authority shall apply the relevant measures referred to in Article 40, and Articles 42 to 53 in food and feed businesses, border control posts, animal by-products establishments or any other location of relevance in the surveillance zone, including means of transport.

2. In the establishments and locations referred to in paragraph 1, the competent authority may apply additional measures adapted to the specific situation in order to prevent the spread of the category A disease within and from the surveillance zone.

Article 55

Duration of the disease control measures in the surveillance zone

1. The competent authority may lift the disease control measures applied in the surveillance zone pursuant to Sections 1 and 3 of this Chapter only if the period set out in Annex XI has elapsed and the following conditions are fulfilled:

(a) the requirements provided for in Article 39 have been met in the protection zone; and

(b) a representative number of establishments keeping animals of listed species have undergone, with favourable results, visits carried out by official veterinarians, in accordance with Article 41.

2. Where the relevant category A disease is transmitted by a listed vector, in accordance with Regulation (EU) 2018/1882, the competent authority may:

(a) set the duration of the measures in the surveillance zone on a case by case basis taking into account factors influencing the risk of spreading the disease; and

(b) provide for the introduction of sentinel animals.

Section 4

Derogations applicable in the restricted zone in the case of further disease outbreaks

Article 56

Derogations from prohibitions of movements of animals within the restricted zones when restriction measures are maintained

1. Where prohibitions of movement of animals provided for in Articles 27 and Article 42 are maintained beyond the period set out in Annex XI because of the official confirmation of further outbreaks of the category A disease, the competent authority may, under exceptional circumstances, authorise the movement of kept animals of listed species from an establishment within the restricted zone in cases not covered by derogations provided for in Articles 27 and Article 42, if:

(a) the operator has submitted a reasoned application for that authorisation;

(b) the risks derived from authorising such movements have been assessed prior to the authorisation and the assessment indicates that the risk of spreading of the category A disease is negligible;

(c) official veterinarians have carried out clinical examinations and have collect samples for laboratory examinations from animals of listed species, including those to be moved, which have yielded favourable results.

2. Where movements of animals are authorised pursuant paragraph 1, the competent authority shall ensure that the transport complies with the requirements laid down in Article 24.

CHAPTER III

Repopulation with terrestrial animals of establishments in restricted zones

Article 57

Conditions to authorise the repopulation of the affected establishment

1. The competent authority shall only authorise the repopulation of the affected establishment if the following requirements are met:

(a) a final cleaning and disinfection and, when relevant, control of insects and rodents has been:

  (i) carried out, in accordance with the procedures set out in points A and C of Annex IV, using the appropriate biocidal products to ensure destruction of the relevant category A disease agent; and

  (ii) adequately documented;

(b) the monitoring period set out in Annex II for the relevant disease, calculated forwards from the date on which the final cleaning and disinfection provided for in point (a) was carried out, has elapsed.

2. The competent authority shall supervise that the final cleaning and disinfection and, when relevant, control of insects and rodents in the affected establishment is carried out in compliance with the requirements in paragraph 1(a).

3. The competent authority shall not allow access to a pasture of kept animals of listed species during the period of time during which it is considered contaminated; this period of time shall be established after carrying out a risk assessment.

4. Where for duly justified reasons the final cleaning and disinfection and, when relevant, the control of insects and rodents referred to in paragraph 1, have not been entirely accomplished in the affected establishment, the competent authority may authorise the repopulation by way of derogation from paragraph 1, provided that:

(a) a period of at least 3 months has elapsed since the preliminary cleaning and disinfection, as referred to in Article 15, was performed; and

(b) prior to granting the authorisation, the competent authority has assessed the risks deriving from that authorisation and the assessment indicates that the risk of spreading the category A disease is negligible.

Article 58

Derogation from the requirement provided for in Article 55(1)(b)

In the event of the official confirmation of an outbreak of a category A disease in food and feed businesses, assembly centres, border control posts, animal by-products establishments or any other location of relevance, including means of transport, the competent authority may authorise the reintroduction of kept animals of listed species for slaughter, assembly operations, inspection or transport, 24 hours after completion of:

(a) the measures referred to in Articles 12, Article 14, Article 15, Article 17, Article 18 and Article 57(1)(a); and

(b) any additional measure applied by the competent authority adapted to the specific situation.

Article 59

Requirements for the repopulation of the affected establishment with kept animals of listed species

1. The competent authority shall supervise the repopulation with kept animals of listed species of the affected establishment complying with the provisions of this Article.

2. Kept animals of listed species intended for repopulation shall:

(a) not originate from an establishment subject to the restrictions provided for in Chapter III; and

(b) be sampled for laboratory examination to rule out the presence of the disease with favourable results prior to their introduction into the establishment.

3. For the purposes of paragraph 2(b), samples shall be collected from:

(a) a representative number of all the animals to be introduced in the establishment, if they are all introduced at the same time and from the same establishment of origin; or

(b) a representative number of animals of each consignment, if animals are all to be introduced at different times or from different establishments of origin.

In the case of day-old-chicks, the competent authority may decide not to perform the sampling for laboratory examination referred to in paragraph 2(b).

4. Kept animals of listed species intended for repopulation shall be introduced in the establishments as follows:

(a) in all the epidemiological units and buildings of the affected establishment;

(b) preferably at the same time or within the monitoring period set out in Annex II for the relevant disease, calculated forwards from the date on which the first animal was introduced; or

(c) in case of open-air farming establishments or when the requirement set out in point (a) is impractical, by using sentinel animals which have been sampled for laboratory examinations with favourable results for the relevant category A disease before being introduced in the establishment.

5. Official veterinarians shall carry out at least a visit to the affected establishment on the last day of the monitoring period set out in Annex II for the relevant disease, calculated forwards from the date on which the animals were placed in the establishment, and in any case before 30 days have elapsed since that day, performing at least:

(a) documentary checks, including production, health and traceability records analysis;

(b) clinical examination of kept animals of listed species; and

(c) collection of samples of animals for laboratory examination in order to confirm or rule out the presence of the relevant category A disease.

6. Any person entering or leaving the establishment shall comply with appropriate biosecurity measures aimed at preventing the spread of the relevant category A disease.

7. Kept animals of listed species shall only leave the establishment under the authorisation of the competent authority and only after obtaining favourable results from the laboratory examination referred to in paragraph 5(c).

8. From the date that the animals were placed in the establishment until the end of the repopulation, in accordance with Article 61, the operator shall:

(a) keep up to date the records of health and production data for kept animals of listed species; and

(b) immediately notify to the competent authority any significant change in production data and any other abnormalities.

9. If unusual mortalities or clinical signs of the relevant category A disease are notified to the competent authority during the period referred to in paragraph 8, the official veterinarians shall without delay collect samples for laboratory examination to rule out the presence of the relevant category A disease.

10. The competent authority may exempt confined establishments from one or more of the provisions laid down in paragraphs 1 to 9 after assessing the risks deriving from that exemption and the assessment indicates that the risk of spreading the category A disease is negligible.

Article 60

Additional requirements for the repopulation of the affected establishment

1. The competent authority shall authorise the repopulation of the affected establishment with animals other than kept listed species taking into account the risk of spreading the relevant category A disease and the risk of vector persistence.

2. The competent authority may extend some or all the provisions provided for in Articles 57 and 59 if preventive killing as provided for in paragraph 4 of Articles 7 and 9 is applied.

Article 61

End of the repopulation of the affected establishment and lifting of disease control measures in the affected establishment

1. The repopulation of the affected establishment shall be considered finalised when the measures provided in Articles 57 and 59, and when relevant in Article 60, have been successfully completed.

2. The competent authority shall lift all the disease control measures applied in the affected establishment in accordance with this Regulation when the repopulation is considered finalised as provided for in paragraph 1.

CHAPTER IV

Disease control measures in wild animals of listed species

Article 62

Measures in the event of suspicion of a category A disease in wild animals of listed species

1. In the event of suspicion of a category A disease in wild animals of listed species in accordance with Article 9(1), (3), and (4) of Delegated Regulation (EU) 2020/689, the competent authority shall immediately conduct an investigation to confirm or rule out the presence of the suspected listed disease.

2. In the course of the investigation referred to in paragraph 1 the competent authority shall at least organise post-mortem examinations and the collection of samples for laboratory examination of wild animals of listed species shot dead or found dead to confirm or rule out the presence of the category A disease.

3. As regards the bodies of dead wild animals in which the relevant category A disease is suspected, whether the wild animals were killed or found dead, the competent authority shall ensure that:

(a) the entire bodies of the dead wild animals or parts thereof are disposed of or processed in accordance with Regulation (EC) No 1069/2009; and

(b) where feasible, any material or substance likely to be contaminated by contact with the bodies of dead wild animals or animal by-products obtained therefrom undergoes cleaning and disinfection or is disposed of following the instructions and under the supervision of official veterinarians.

Article 63

Measures in the event of an outbreak of a category A disease in wild animals of listed species

1. In the event of an official confirmation of an outbreak of a category A disease in wild animals of listed species in accordance with Article 9(2), (3) and (4) of Delegated Regulation (EU) 2020/689, the competent authority may determine an infected zone in order to prevent the further spread of the disease based on:

(a) the disease profile;

(b) the estimated population of wild animals of listed species;

(c) the risk factors contributing to the spread of the relevant category A disease, in particular, the risk of the introduction of a category A disease into establishments keeping animals of listed species;

(d) sampling results; and

(e) other relevant factors.

2. As regards the bodies of wild animals in which the relevant category A disease has been confirmed, whether the wild animals were killed or found dead, the competent authority shall ensure that:

(a) their entire bodies of the dead wild animals or parts thereof are disposed of or processed in accordance with Regulation (EC) No 1069/2009; and

(b) where feasible, any material or substance likely to be contaminated by contact with the bodies of dead wild animals or animal by-products therefrom undergoes cleaning and disinfection or is disposed of following the instructions and under the supervision of official veterinarians.

3. The competent authority may adapt the boundaries of the initial infected zone:

(a) in order to control the further spread of the relevant category A disease; and

(b) in the case of confirmation of further outbreaks of the category A disease in wild animals.

4. The competent authority shall immediately inform operators, clinical veterinarians, hunters, other relevant competent authorities and any other natural or legal person concerned about the outbreak of the disease and the control measures adopted.

Article 64

Measures to be applied in the infected zone

1. In the infected zone determined in accordance with Article 63, the competent authority shall organise post-mortem examinations of wild animals of listed species shot dead or found dead, including when necessary sampling for laboratory examination.

2. In the infected zone the competent authority shall at least:

(a) implement risk mitigation and reinforced biosecurity measures in order to prevent the spread of the category A disease from the affected animals and infected zone to unaffected animals or to humans;

(b) prohibit movements of wild animals of listed species and products of animal origin thereof as provided for to in Commission Delegated Regulation (EU) 2020/688 ([16]); and

(c) ensure that all bodies of dead wild animals of listed species, whether the animals were killed or found dead, or parts thereof, are disposed of or processed in accordance with in Regulation (EC) No 1069/2009.

Article 65

Additional measures to apply in the infected zone

In order to avoid the spreading of the category A disease, in the infected zone the competent authority may:

(a) regulate movements of kept animals of listed species;

(b) regulate hunting activities and other outdoors activities;

(c) restrict the feeding of wild animals of listed species; and

(d) develop and implement an eradication plan for the category A disease in wild animals of listed species if the epidemiological situation so requires.

Article 66

Operational expert group

In the event of an officially confirmed outbreak of a category A disease in wild animals of listed species and in the case that the competent authority determines an infected zone in accordance with Article 63, the competent authority shall establish an operational expert group as referred to in Article 43 of Regulation (EU) 2016/429 to assist the competent authority in:

(a) assessing the epidemiological situation and its evolution;

(b) defining the infected zone;

(c) establishing the appropriate measures to be applied in the infected zone in accordance with this Chapter and their duration; and

(d) developing an eradication plan, when relevant.

Article 67

Duration of measures in the infected zone

The competent authority shall maintain the measures applied in the infected zone in accordance with this Chapter until the epidemiological information indicates that the relevant wild population no longer poses a risk of introduction of a category A disease into establishments keeping animals of listed species and the operational group recommends lifting of the measures.

CHAPTER V

Disease control measures for category B and C diseases of terrestrial animals

Article 68

Preliminary disease control measures to be applied when a category B or C disease is suspected by the competent authority in Member States or zones that have been granted with the disease free status

In the event of suspicion of a category B or C disease in accordance with Article 9(1), (3) or (4) of Delegated Regulation (EU) 2020/689, in Member States or zones that have been granted the disease free status pursuant to Article 36(4) of Regulation (EU) 2016/429 or Article 84(1) of Delegated Regulation (EU) 2020/689, the competent authority shall apply the measures laid down in:

([16]) Commission Delegated Regulation (EU) 2020/688 of 17 December 2019 supplementing Regulation (EU) 2016/429 of the European Parliament and of the Council, as regards animal health requirements for movements within the Union of terrestrial animals and hatching eggs (see page 140 of this Official Journal).

(a) Articles 21, 22, 23 of Delegated Regulation (EU) 2020/689 for infection with *Brucella abortus, B. melitensis, B. suis,* infection with *Mycobacterium tuberculosis complex,* enzootic bovine leucosis, infectious bovine rhinotracheitis/infectious pustular vulvovaginitis, infection with Aujeszky's disease virus and bovine viral diarrhoea;

(b) Article 35 of Delegated Regulation (EU) 2020/689 for infection with rabies virus; and

(c) Article 41 of Delegated Regulation (EU) 2020/689 for infection with bluetongue virus (serotype 1-24).

Article 69

Disease control measures to be applied when a category B or C disease is confirmed

In the event of confirmation of a category B or C disease in accordance with point (2) of Article 9 of of Delegated Regulation (EU) 2020/689 in Member States or zones that have been granted the disease free status in with paragraph 4 of Article 36 of Regulation (EU) 2016/429 or paragraph 1 Article 84 of Delegated Regulation (EU) 2020/689, the competent authority shall apply the measures laid down in:

(a) Articles 24 to 31 of Delegated Regulation (EU) 2020/689 for infection with *Brucella abortus, B. melitensis, B. suis,* infection with *Mycobacterium tuberculosis complex,* enzootic bovine leucosis, infectious bovine rhinotracheitis/infectious pustular vulvovaginitis, infection with Aujeszky's disease virus and bovine viral diarrhoea;

(b) Article 36 of Delegated Regulation (EU) 2020/689 for infection with rabies virus; and

(c) Article 42 of Delegated Regulation (EU) 2020/689 for infection with bluetongue virus (serotype 1-24).

PART III

AQUATIC ANIMALS

CHAPTER I

Disease control measures for category A diseases in aquaculture animals

Section 1

Preliminary disease control measures in the event of suspicion of a category A disease in aquaculture animals

Article 70

Obligations on operators in the event of suspicion of category A disease in aquaculture animals in establishments

In the event of suspicion of a category A disease in aquaculture animals of listed species, operators shall take the following disease control measures in order to prevent the spread of the category A disease from the affected animals and aquaculture establishments under their responsibility to other unaffected aquatic animals until the competent authority rules out the presence of the category A disease:

(a) isolate, where technically possible, all aquaculture animals in the establishment suspected of being infected with the category A disease;

(b) prevent movements of aquaculture animals into and from the establishment;

(c) keep records of all visits and movements from and to the establishment;

(d) keep any product, piece of equipment, material or substance likely to be contaminated with and to transmit category A diseases isolated and as far as practicable protected from vectors and other aquatic animals;;

(e) implement the appropriate biosecurity measures to avoid spread of the category A disease;

(f) provide the competent authority, on its request, with any relevant information regarding the category A disease; and

(g) follow any instructions given by the competent authority regarding the control of category A disease, in accordance with Regulation (EU) 2016/429 and this Regulation.

Article 71

Investigation by the competent authority of the suspicion of a category A disease in aquaculture animals in an establishment

1. In the event of the suspicion of a category A disease in aquaculture animals in an establishment in accordance with Article 9(1), (3) and (4) of Delegated Regulation (EU) 2020/689, the competent authority shall immediately conduct an investigation to confirm or rule out the presence of the suspected listed disease.

2. In the course of the investigation referred to in paragraph 1 the competent authority shall ensure that the official veterinarians perform at least:

(a) clinical examinations of aquaculture animals; and

(b) the collection of samples for laboratory examination.

Article 72

Preliminary restriction and biosecurity measures to be applied in the event of the suspicion of a category A disease in aquaculture animals

1. In the event of suspicion of a category A disease in an establishment, the competent authority shall place the establishment under official surveillance and immediately impose the following preliminary restriction and biosecurity measures, in order to prevent the spread of the category A disease from the affected aquaculture animals and the establishment to unaffected aquatic animals:

(a) prohibition of movements of aquaculture animals into and from the establishment;

(b) prohibition of non-essential movements from the establishment of means of transport and equipment;

(c) prohibition of slaughter of aquaculture animals for human consumption;

(d) where technically feasible and regarded necessary, order the isolation of all aquaculture animals; and

(e) when practicable, implement adequate means and measures to control birds and other predators.

2. The competent authority may order preventive killing of listed species at the affected establishment where a category A disease is suspected provided that all necessary biosecurity and other risk-mitigating measures are applied to prevent the spread of the category A disease from the establishment.

3. The competent authority shall by way of derogation from Article 10(i) of Regulation (EC) No 1069/2009 and after carrying out a risk assessment, authorise movements of aquaculture animals for the sole purpose of immediate killing in a disease control aquatic food establishment or a plant approved for processing or disposal of as animal-by-products of category 1 or category 2 in accordance with that Regulation. The authorisation may only be granted when the necessary biosecurity and other risk-mitigating measures are applied to prevent the spread of the category A disease.

4. All animal by-products from dead aquaculture animals which have died or have been killed in accordance with this Article, including molluscs shells with meat, shall by way of derogation from Article 10(i) of Regulation (EC) No 1069/2009 be processed or disposed of as category 1 or category 2 material in accordance with that Regulation to ensure that the relevant disease agent is inactivated and to prevent the transmission of the disease to other aquatic animals.

Article 73

Inventory and record analysis in the event of the suspicion of a category A disease in aquaculture animals

1. In the event of suspicion of a category A disease, the competent authority shall order and verify that, without delay, operators of the establishments where a category A disease is suspected compile and maintain an up-to-date inventory of the following:

(a) the species, categories and quantities (numbers, volume or weight) of all aquaculture animals kept in the establishment;

(b) any product, material or substance likely to be contaminated with or likely to transmit the category A disease; and

(c) the mortality in each epidemiological unit within the establishment, recorded on a daily basis.

2. In the framework of the epidemiological enquiry, as referred to in Article 57 of Regulation (EU) 2016/429 and carried out in establishments where the disease is suspected, the official veterinarians shall analyse at least the records listed in paragraph 1 of Article 186 of Regulation (EU) 2016/429.

Article 74

Extension of disease control measures in the event of the suspicion of a category A disease to other establishments

In order to prevent the spread of a category A disease the competent authority shall conduct an investigation as provided for in Article 71 and, after carrying out a risk assessment, extend the relevant measures provided for in Articles 72 and 73 to:

(a) establishments situated in the same compartment as the establishment where the disease is suspected, or which, due to distance, hydrodynamic conditions or topographic conditions, have an increased risk for contracting the relevant disease agent from the establishment where the disease is suspected;

(b) any establishment other than those referred to in point (a) which has a direct epidemiological link with the establishment where the disease is suspected.

Article 75

Temporary restricted zones around the establishment

The competent authority may establish a temporary restricted zone around the establishment where there is a suspicion of category A disease and where preliminary disease control measures are applied as referred to in Article 72 and Article 73 taking into account the following circumstances:

(a) the location of the establishment in an area with other establishments keeping aquaculture animals of listed species for which a category A disease is suspected;

(b) the movement of animals in the vicinity of the suspected establishment;

(c) the delay in confirming the category A disease pursuant to Article 77;

(d) the insufficient information on the possible origin and routes of introduction of the suspected category A disease; and

(e) the disease profile, in particular the routes and speed of transmission of the disease and the persistence of the disease in the relevant population of aquaculture animals of listed species.

Article 76

Measures to apply in the event of suspicion of a category A disease in food and feed businesses, purification centre, dispatch centre, border control posts, animal by-products establishments or any other location of relevance, including means of transport

1. In the event of suspicion of a category A disease in accordance with Article 9(1), (3) and (4) of Delegated Regulation (EU) 2020/689 in food and feed businesses, purification centres, dispatch centres, border control posts, animal by-products establishments or any other location of relevance, including means of transport, the competent authority shall apply:

(a) the measures provided for in Articles 71 to 75; and

(b) if needed, additional measures adapted to the specific situation in order to prevent the spread of the category A disease from the animals and establishments or locations under suspicion to unaffected animals.

2. The competent authority shall apply provisions laid down in Articles 71 to 75 also in the establishments of origin of the animals or products present in the establishments and locations referred to in paragraph 1.

Section 2

Disease control measures in the event of official confirmation of A category A disease in aquaculture animals

Article 77

Official confirmation of a category A disease in aquaculture animals

The competent authority shall officially confirm an outbreak of a category A disease in aquaculture animals when the conditions set out in Article 9(2), (3) and (4) of Delegated Regulation (EU) 2020/689 are met.

Article 78

Disease control measures in the event of official confirmation of an outbreak of category A disease in an establishment

1. Following the official confirmation of an outbreak of a category A disease in accordance with Article 77, the competent authority shall in addition to the measures provided for Article 72 and Article 73, order that the following disease control measures are immediately applied under the supervision of the official veterinarians, to the establishment where the official confirmation of an outbreak of a category A disease has occurred:

(a) fish and crustaceans of listed species shall be killed as soon as possible and molluscs of listed species shall be removed from water as soon as possible;

(b) animals referred to in (a) shall by way of derogation from Article 10(i) of Regulation (EC) No 1069/2009 be disposed of as category 1 or category 2 material in accordance with that Regulation;

(c) the measures provided for in point (a) and (b) shall be carried out either:

(i) in the establishment where the official confirmation of an outbreak of a category A disease has occurred with subsequent processing on site; or

(ii) in a disease control aquatic food establishment, or in a plant approved in accordance with Regulation (EC) No 1069/2009 for processing or disposal in a way that prevents risk of spreading the category A disease;

(d) aquaculture animals of non-listed species shall, as soon as possible, be killed or slaughtered for human consumption or, in case of molluscs, removed from water in accordance with paragraph 1(b);

(e) appropriate measures shall be applied to limit any possible spread of the category A disease to and from any wild aquatic animals that might be in epidemiological contact with the establishment;

(f) all potentially contaminated products, materials or substances shall be isolated until:

(i) they are disposed of in accordance with Regulation (EC) No 1069/2009, in the case of animal by-products;

(ii) by way of derogation from Article 10(i) of Regulation (EC) No 1069/2009 they are disposed of or processed as category 1 or category 2 material in accordance with that Regulation, in the case of products of animal origin;

(iii) cleaning and disinfection measures have been completed in accordance with the provisions in Article 80, in the case of materials and substances which are fit for cleaning and disinfection; and

(iv) they are removed from the establishment and disposed of under the supervision of official veterinarians, in the case of feeding stuff and other materials unfit for cleaning and disinfection.

2. The competent authority shall order and supervise:

(a) the transport from the affected establishment of animal by-products referred to in paragraph 1(f)(i) and of the products of animal origin referred to in paragraph 1(f)(ii) being in compliance with the provisions of Regulation (EC) No 1069/2009; and

(b) the transport from the affected establishment of materials or substances referred to in paragraph 1(f)(iv) being in compliance with its instructions regarding biosecurity and biosafety conditions to prevent the spread of category A disease agent.

3. By way of derogation from paragraph 1(a), the competent authority may, after carrying out a risk assessment, allow slaughter of fish or crustaceans or in case of molluscs removal from water, for human consumption, at the establishment or in a disease aquatic control food establishment, provided that appropriate biosecurity and other necessary risk-mitigating measures to prevent the spread of the category A disease are taken. All animal by-products resulting from that derogation shall, by way of derogation from Article 10(i) of Regulation (EC) No 1069/2009, be processed or disposed of as category 1 or category 2 material in accordance with that Regulation.

4. By way of derogation from paragraph 1(d), the competent authority may, after carrying out a risk assessment, decide not to kill, slaughter or remove from water aquaculture animals of non-listed species provided that appropriate risk-mitigating measures are applied to prevent any risk of spreading of the relevant category A disease from the establishment.

5. By way of derogation from paragraph 1(f)(ii), the competent authority may, after carrying out a risk assessment, allow the placing on the market of products of animal origin in accordance with Article 83.

Article 79

Specific derogations from control measures in establishments where listed species are kept for scientific purposes or purposes related to conservation of endangered species

1. The competent authority may grant derogations from the measures provided for in Article 78(1)(a) and (c) in the event of an official confirmation of a category A disease in establishments where listed species are kept for scientific purposes or purposes related to conservation of endangered species, provided that:

(a) the animal health status of the concerned Member State, or of other Member States, is not jeopardised; and

(b) all appropriate biosecurity measures as listed in Article 78 are taken to prevent any risk of spreading of the category A disease agent.

2. Where a derogation is granted pursuant to paragraph 1, the competent authority shall ensure that aquaculture animals of listed species covered by the derogation are:

(a) kept in premises where appropriate biosecurity measures to avoid spread of the relevant category A disease are implemented; and

(b) subjected to further surveillance and laboratory examination and are not moved from the establishment until the laboratory tests have indicated that they do not pose a risk of further spread of the relevant category A disease.

Article 80

Cleaning and disinfection

1. The competent authority shall order the operators to carry out, immediately after the completion of the disease control measures provided for in Article 78, the cleaning and disinfection of:

(a) the establishment, as far as the competent authority considers it is technically possible;

(b) any husbandry-related equipment including but not limited to feeding, grading, treatment, vaccination and workboats;

(c) any production-related equipment including but not limited to cages, netting, trestles, bags and long-lines;

(d) any protective clothing or safety equipment used by operators and visitors; and

(e) all means of transport including tanks and other equipment used to move infected animals or personnel who have been in contact with infected animals.

2. The cleaning and disinfection as provided for in paragraph 1 shall be carried out:

(a) in accordance to a protocol previously agreed between the competent authority and the operator; and

(b) under the supervision of official veterinarians.

Article 81

Fallowing of the affected establishment

The competent authority shall order operators to carry out, after the completion of the cleaning and disinfection provided for in in Article 80, the fallowing of the affected establishment for the period of time laid down in Annex XIII.

Article 82

Extension of disease control measures in the event of confirmation of a category A disease

In order to prevent the spread of a category A disease the competent authority shall conduct an investigation provided for in Article 71 and after carrying out a risk assessment, extend some or all of the measures provided for in Articles 78, 80 and 81 to:

(a) establishments of the same compartment or which due to distance, hydrodynamic conditions or topographic conditions, have an increased risk for contracting the relevant disease agent from the suspected establishment where the disease is confirmed;

(b) any establishment which as a result of the enquiry provided for in Article 57 of Regulation (EU) 2016/429, has shown a direct epidemiological link with the establishment where the disease is confirmed.

Article 83

Placing on the market of products of animal origin from aquaculture animals of listed species produced in infected establishments

1. When granting a derogation pursuant Article 78(5), the competent authority may allow the placing on the market of products of animal origin only if the following conditions are fulfilled:

(a) fish must be slaughtered and eviscerated before dispatch;

(b) molluscs and crustaceans must be fully traceable and processed to non-viable products unable to survive if returned to the water, before dispatch.

When purification is required before processing and placing on the market, it shall be conducted at a disease control aquatic food establishment or in a bio-secure purification centre.

2. The products of animal origin referred to in paragraph 1 shall be intended for:

(a) to the final consumer directly; or

(b) for further processing in a disease control aquatic food establishment.

Article 84

Measures to be applied in the event of confirmation of category A diseases in, food and feed businesses, purification centre, dispatch centre, border control posts or any other location of relevance, including means of transport

1. In the event of confirmation of a category A disease in food and feed businesses, purification centre, dispatch centre, border control posts or any other location of relevance, including means of transport, in accordance with Article 77, the competent authority shall apply:

(a) the measures provided for in Articles 78, Article 80 and Article 81; and

(b) if needed, additional measures adapted to the specific situation in order to prevent the spread of the category A disease from the affected animals and establishments or locations to unaffected animals.

2. The competent authority shall apply provisions laid down in Articles 78, Article 80 and Article 81 also in the establishments of origin of the animals or products present in the establishments and locations referred to in paragraph 1.

CHAPTER II

Disease control measures for category A diseases of aquaculture animals in the restricted zone

Section 1

General disease control measures in the restricted zone

Article 85

Establishment of a restricted zone

1. In the event of the official confirmation of an outbreak of a category A disease in an establishment, food and feed business, animal by–products establishment or any other location of relevance, including means of transport, the competent authority shall immediately establish a restricted zone around the affected establishment or location, including:

(a) a protection zone around the establishment or location where the category A disease is confirmed;

(b) a surveillance zone around the protection zone; and

(c) if necessary, on the basis of the criteria set out in Article 64(1) of Regulation (EU) 2016/429, further restricted zones around or adjacent to the protection and surveillance zones.

2. The extent of the zones shall be set on a case-to-case basis, taking into account factors influencing the risk of spreading the disease. To that end, the the competent authority shall consider the following data and criteria:

(a) data from the epidemiological enquiry in accordance with Article 57 in Regulation (EU) 2016/429;

(b) relevant hydrodynamic data;

(c) criteria listed in Article 64(1) of Regulation (EU) 2016/429; and

(d) criteria provided for in Annex XIV to this Regulation.

3. The competent authority shall adapt the boundaries of the initial restricted zone, including the boundaries of the protection, surveillance and the further restricted zones, in the case of the overlapping of two or more restricted zones due to further outbreaks of the category A disease.

4. By way of derogation from paragraph 1, the competent authority may due to specific geographical, hydrodynamic and epidemiological circumstances, and after carrying out a risk assessment taking into account the disease profile:

(a) not establish the restricted zone as provided for in paragraph 1 around the infected establishment or location;

(b) establish a restricted zone consisting of a protection zone without any adjacent surveillance zone; and

(c) not establish a restricted zone when a category A disease is confirmed in food and feed businesses, purification centre, dispatch centre, border control posts, animal by-products establishments or any other location of relevance, including means of transport.

5. The competent authority may derogate, to the extent necessary and after carrying out a risk assessment taking into account geographical, hydrodynamic, epidemiological circumstances and the disease profile, from the provisions of this Chapter:

(a) in the further restricted zones; and

(b) in the case that the competent authority decides to establish the restricted zone when an outbreak of a category A disease occurs in establishments or any other locations of relevance referred to in paragraph 4(c).

Article 86

Measures to be applied in the restricted zone

1. The competent authority shall without delay compile and keep an up-to-date inventory of all establishments keeping aquaculture animals of listed species located in the restricted zone, including the species, categories and the estimated number of animals in each establishment.

2. In the establishments located within the restricted zone, the competent authority may, on the basis of epidemiological information or other relevant evidence and after carrying out a risk assessment, implement preventive killing or, slaughtering for human consumption or, in the case of molluscs, removal from water, of aquaculture animals of listed species pursuant to Article 78(1)(a) and (2).

3. Any collection of samples, in establishments in the restricted zone keeping aquaculture animals of listed species, for purposes other than to confirm or rule out the presence of the relevant category A disease, shall be authorised by the competent authority.

Section 2

Disease control measures in the protection zone

Article 87

Measures to be applied in establishments keeping aquaculture animals in the protection zone

1. The competent authority shall order operators of establishments keeping aquaculture animals of any species in the protection zone, other than the establishment in which the category A disease has been confirmed, to carry out at least the following measures in order to prevent and control the spread of the disease:

(a) without delay update the records of the inventory provided for in Article 73(1);

(b) when practicable, implement appropriate measures to limit any possible spread of the category A disease to and from any wild aquatic animals that might be in epidemiological contact with the establishment;

(c) prevent aquaculture animals from being removed from the establishment in which they are kept unless authorised by the competent authority;

(d) implement appropriate biosecurity measures to any product, piece of equipment, material or substance likely to spread the relevant category A disease;

(e) reduce the number of visitors to those which are strictly necessary to operate the establishment in a proper manner; and

(f) where practicable, implement appropriate means of cleaning and disinfection at the entry and exit of the establishment.

2. The competent authority shall order and supervise that the operator has processed or disposed of as the relevant category material in accordance with Regulation (EC) No 1069/2009 animal by-products from aquaculture animals of listed species that have died or have been killed, including molluscs shells with meat, in establishments keeping listed species within the protection zone.

3. The competent authority may decide after carrying out a risk assessment that Articles 87 and 88 only apply to aquaculture animals of listed species.

Article 88

Visits by official veterinarians in establishments in the protection zone

1. The competent authority shall ensure that official veterinarians carry out at least one visit to all the establishments referred to in Article 87 as soon as possible and without delay after the official confirmation of an outbreak of category A disease, with priority directed to establishments that the competent authority has assessed as posing a high risk as regards contracting or spreading disease.

2. When carrying out the visits referred to in paragraph 1, official veterinarians shall perform at least the following activities:

(a) documentary checks and record analysis;

(b) verification of the implementation of the measures intended to prevent the introduction or spread of the relevant category A disease in accordance with to Article 87;

(c) clinical examination of aquaculture animals of listed species; and

(d) if necessary, collection of samples for laboratory examination in order to confirm or rule out the presence of the relevant category A disease.

3. The competent authority may require further veterinary visits to the establishments to follow up on the situation.

4. The competent authority shall keep a record of activities and visits referred to in paragraph 1, 2 and 3, and the findings thereof.

Article 89

Prohibitions in relation to movements of aquaculture animals, products from aquaculture animals, other substances and material within, from or to the protection zone

1. The competent authority shall prohibit the following movements within the protection zone:

(a) movement of aquaculture animals of listed species between establishments in the protection zone;

(b) movement of aquaculture animals of listed species from or to the protection zone;

(c) any movements from the establishments within the protection zone of means of transport and any equipment, product, material or substance likely to transmit the relevant category A disease;

(d) transport of aquaculture animals by well-boats through the protection zone; and

(e) dispatch of unprocessed animal by-products from aquaculture animals of any species from establishments in the protection zone.

2. The competent authority may, after carrying out a risk assessment, extend the prohibitions provided for in paragraph 1(a) to 1(d) to animals of non-listed species and their products.

Article 90

General conditions to grant derogations from prohibitions of movement and transport concerning aquatic animals and products in the protection zone

1. By way of derogation from prohibitions provided for in Article 89(1), the competent authority may authorise the movement and transport of aquatic animals and products in the cases covered by Articles 91 to 94 under the specific conditions provided for in those Articles and the general conditions laid down in paragraph 2 of this Article.

2. When granting the authorisations provided for in pargraph 1, the competent authority shall ensure that the following conditions are met:

(a) all movements must be carried out exclusively via designated routes, agreed with the competent authority, without unloading or stopping;

(b) any exchange of water and discharges of water during the transportation must be carried out in areas, establishments or water exchange points approved by the competent authority;

(c) the means of transport must be constructed and maintained in such a way that they can undergo proper cleaning and disinfection;

(d) the means of transport are cleaned and disinfected:

(i) prior to the transport operations; and

(ii) after transport operations under the supervision of the official veterinarian;

(e) any other supplementary biosecurity measure considered necessary by the competent authority must be taken in relation to transport operations.

Article 91

Specific conditions for slaughter, and movements for slaughter or processing of aquaculture animals from listed species from establishments in the protection zone

1. Aquaculture animals from establishments keeping listed species in the protection zone may be:

(a) slaughtered within the establishment in compliance with biosecurity measures provided for by the competent authority; or

(b) moved for immediate slaughter for human consumption in a disease control aquatic food establishment; or

(c) in the case of molluscs, removed from water and moved to a disease control aquatic food establishment for purification if necessary and further processing.

2. The competent authority may, after carrying out a risk assessment based on relevant epidemiological data, limit the application of the measures provided for in paragraph 1 to establishments keeping solely aquaculture animals of species listed in the third column of the Annex to Commission Implementing Regulation (EU) 2018/1882.

3. When authorising the movements of aquaculture animals referred to in paragraph 1(b), the competent authority responsible for the disease control aquatic food establishment shall:

(a) be informed of the intention to send aquaculture animals of listed species to the disease control aquatic food establishment;

(b) agree to receive the aquaculture animals in question;

(c) supervise and confirm the slaughter of the animals to the competent authority of dispatch;

(d) ensure that the aquaculture animals of listed species originating from the protection zone are kept separately from aquaculture animals of listed species originating from outside the protection zone, and slaughtered or processed separately from those animals;

(e) monitor the slaughtering or processing;

(f) ensure that the cleaning and disinfection of the premises is completed before aquaculture animals from establishments outside the protection zone are slaughtered or processed;

(g) ensure that products of animal origin obtained from the aquaculture animals comply with the specific conditions for placing on the market provided for in Article 92; and

(h) ensure that animal by-products from slaughter or other processes referred to in paragraph 1, are processed or disposed of in accordance with Regulation (EC) No 1069/2009.

Article 92

Specific conditions for placing on the market of products of animal origin from aquaculture animals of listed species produced in non-affected establishments in the protection zone

1. The competent authority may authorise placing on the market of products of animal origin obtained from aquaculture animals of listed species in non-affected establishments in the protection zone, provided that the following conditions are fulfilled:

(a) fish must be slaughtered and eviscerated before dispatch; and

(b) molluscs and crustaceans must be fully traceable and processed to non viable products unable to survive if returned to the water, before dispatch.

2. The products of animal origin referred to in paragraph 1 shall be intended:

(a) for direct supply to the final consumer; or

(b) for further processing in a disease control aquatic food establishment.

Article 93

Special conditions for authorising transport of unprocessed animal by-products from establishments located in the protection zone

The competent authority may authorise the transport of unprocessed animal by-products of aquaculture animals of listed species from establishments in the protection zone to a plant for further processing in accordance with Regulation (EC) No 1069/2009.

Article 94

Risk-mitigating measures concerning certain activities related to aquatic animals within the protection zone

1. The competent authority may, after carrying out a risk assessment, implement risk- mitigating measures as regards:

(a) commercial and recreational fishing activities in the protection zone;

(b) other activities that are related to aquatic animals in the protection zone and that might pose a risk of spreading the disease; and

(c) transport of service boats used for maintenance activities and treatment of aquatic animals in the protection zone.

2. In the framework of the measures provided for in paragraph 1, the competent authority may, as relevant, order the cleaning and disinfection of equipment, which has been used in waters covered by the protection zone.

Article 95

Measures to be applied in food and feed businesses, purification centre, dispatch centres, border control posts, animal by-products establishments or any other location of relevance in the protection zone, including means of transport

1. The competent authority shall apply the measures provided for in Articles 87 to 93 in food and feed businesses, purification centre, dispatch centres, border control posts, animal by-products establishments or any other location of relevance in the protection zone, including means of transport.

2. In the establishments and locations referred to in paragraph 1, the competent authority may apply additional measures adapted to the specific situation in order to prevent the spread of the category A disease within and from the protection zone.

Article 96

Removal of aquaculture animals from affected establishments and subsequent risk- mitigating measures

1. The competent authority shall determine a point in time by which aquaculture animals in all infected establishments shall be removed.

2. The competent authority may decide, after carrying out a risk assessment, that paragraph 1 also applies to establishments in the protection zone in which the category A disease has not been confirmed in order to control and prevent the possible spread of the diseases.

3. After the removal of aquaculture animals as provided for in paragraph 1, cleaning, disinfection and fallowing shall be carried out in accordance with Articles 80 and 81.

4. The competent authority shall order synchronous fallowing of the affected establishments and the establishments selected in accordance with paragraph 2.

5. The synchronous fallowing referred to in paragraph 4 shall last for the period of time laid down in Annex XIII.

Article 97

Duration of disease control measures in the protection zone, repopulation of establishments covered by the protection zone

1. The competent authority shall maintain the disease control measures in the protection zone provided for in Section 2 of this Chapter until:

(a) the measures in Article 96 are carried out and completed; and

(b) the competent authority has, based on the outcome of the investigations conducted in accordance with Article 88, ruled out any occurrence of the relevant category A disease in the other establishments within the protection zone.

2. When the conditions set out in paragraph 1 are met:

(a) the competent authority shall apply the measures provided for in Section 3 of this Chapter in the protection zone for the period of time set out in Article 101; and

(b) the establishments referred to in Article 96(1) and (2) and previously covered by the protection zone may be repopulated.

Section 3

Disease control measures in the surveillance zone

Article 98

Measures to be applied in establishments in the surveillance zone

1. In the surveillance zone, the competent authority shall order that the measures provided for in Article 87 are applied in all establishments keeping aquaculture animals of listed species.

2. Official veterinarians shall visit the establishments referred to in paragraph 1 and carry out the activities provided for in Article 88(2) as appropriate.

3. The establishments within the surveillance zone shall undergo surveillance comprising visits and samplings as described in point 1 of Annex XV.

4. The surveillance provided for in paragraph 3 shall be carried out by the competent authority.

Article 99

Measures in relation to the movement and transport of aquaculture animals within from or to the surveillance zone

1. The competent authority shall prohibit any movements of aquaculture animals from establishments within the surveillance zone for slaughter, further farming or release into the wild outside the surveillance zone.

2. The competent authority shall ensure that any transport of aquaculture animals of listed species within or into the surveillance zone shall be conducted under conditions as set out in Article 90(a) to (e) and in Article 91.

3. The competent authority may order appropriate supplementary biosecurity measures to be applied to transport operations, including the unloading in the designated establishment of destination in order to control and prevent the possible spread of the diseases.

4. By way of derogation from paragraph 1, and in agreement with the competent authority of the place of destination, the competent authority may authorise movements of aquaculture animals provided that appropriate biosecurity measures to prevent the spreading of the category A disease are applied.

Article 100

Measures to be applied in food and feed businesses, purification centre, dispatch centres, border control posts, animal by-products establishments or any other location of relevance in the surveillance zone, including means of transport

1. The competent authority shall order without delay that the measures provided for in Articles 98 and 99 be applied in food and feed businesses, purification centre, dispatch centres, border control posts, animal by-products establishments or any other location of relevance in the surveillance zone, including means of transport.

2. In the locations referred to in paragraph 1, the competent authority may apply additional measures adapted to the specific situation in order to prevent the spread of the category A disease within and from the surveillance zone.

Article 101

Duration of disease control measures in the surveillance zone

The competent authority shall lift the disease control measures provided for in this Section when the period of surveillance, set out in point 2 of Annex XV, for the relevant category A disease has elapsed with favourable results.

CHAPTER III

Disease control measures in wild aquatic animals

Article 102

Measures in the event of a suspect case of a category A disease in wild aquatic animals of listed species

In the event of a suspect case of a category A disease in wild aquatic animals of listed species in accordance with Article 9(1), (3) and (4) in Delegated Regulation (EU) 2020/689, the competent authority shall:

(a) immediately conduct an investigation of wild aquatic animals of listed species fished, caught, collected or found dead to confirm or rule out the presence of the category A disease in accordance with Article 71(2);

(b) ensure that all animal by-products obtained from the wild aquatic animals of listed species suspected to be infected, including molluscs shells with meat, are processed or disposed of as category 1 or category 2 material in accordance with Regulation (EC) No 1069/2009;

(c) ensure that, where practicable any material or substance likely to be contaminated by animals suspected to be affected or by the animal by-products obtained from those animals undergoes cleaning and disinfection or is disposed of following the instructions and under the supervision of official veterinarians; and

(d) provide relevant information to the operators or authorities in charge of the management of the relevant animal population.

Article 103

Measures in the event of an outbreak of a category A disease in wild aquatic animals of listed species

1. In the event of an officially confirmed case of a category A disease in wild aquatic animals of listed species, the competent authority shall determine an infected zone on the basis of:

(a) relevant hydrodynamic, topographic and epidemiological conditions;

(b) the disease profile and the estimated population of aquatic animals of listed species; and

(c) the risk factors contributing to the spread of the relevant category A disease, in particular those associated with the risk of introducing the disease into establishments keeping aquatic animals of listed species.

2. The competent authority may adapt the boundaries of the initial infected zone:

(a) in order to control the further spread of the relevant category A disease; and

(b) in the case of confirmation of further outbreaks of the category A disease in wild animals.

3. The competent authority shall immediately inform operators, other relevant competent authorities, relevant veterinarians, and any other natural or legal person concerned, about the outbreak of the diseases and the control measures adopted.

Article 104

Measures to be applied in the infected zone

1. In the infected zone established in accordance with Article 103 the competent authority shall:

(a) implement risk mitigation and reinforced biosecurity measures, in order to prevent the spread of the category A disease from the affected animals and infected zone to unaffected animals and areas;

(b) prohibit any movement by humans of wild aquatic animals of listed species and products of animal origin obtained from those animals from the infected zone;

(c) by way of derogation from Article 10(i) of Regulation (EC) No 1069/2009 ensure that all animal by-products obtained from the wild aquatic animals of listed species in the infected zone including molluscs shells, with meat are processed or disposed of as category 1 or category 2 material in accordance with that Regulation;

(d) ensure, where practicable, that any material or substance likely to be contaminated by wild aquatic animals of listed species in the infected zone or animal by-products obtained from those animals undergoes cleaning and disinfection or is disposed of following the instructions and under the supervision of official veterinarians; and

(e) prohibit bringing into establishments keeping aquaculture animals of listed species both within and outside the infected zone or to water catchment or coastal areas outside the infected zone any parts of aquatic animals of listed species whether, fished, caught, collected or found dead in the infected zone as well as any product, material or substance which is likely to be contaminated with a category A disease in the infected zone.

2. By way of derogation from paragraph 1(b) and for the purpose of preserving valuable genetic material, the competent authority may authorise movements of wild aquatic animals of listed species from the infected zone to an establishment authorised by the competent authority for that purpose, provided that appropriate biosecurity measures to prevent the spread of the category A disease are applied. The establishment of destination shall be considered as an establishment located in the infected zone for the purposes of Article 108.

Article 105

Additional measures to be applied in the infected zone

1. After carrying out a risk assessment, the competent authority shall determine the additional measures necessary to control or eradicate the relevant category A disease.

2. As part of the control or eradication of the relevant category A disease the competent authority may:

(a) suspend restocking, fishing, collecting and catching activities;

(b) order mandatory cleaning and disinfection of fishing equipment and boats and other equipment likely to be contaminated; and

(c) increase fishing, collecting and catching activities or implement other relevant measures to eradicate the disease.

3. The measures provided for in paragraph 1 shall be implemented after consultations and in cooperation with the operational expert group referred to in Article 107 and other authorities and stakeholders.

Article 106

Extension of measures

The competent authority may decide that relevant measures in Articles 102 to 105 also apply to aquatic animals of non-listed species.

Article 107

Operational expert group

1. In the event of a confirmed case of a category A disease in wild aquatic animals of listed species, the competent authority shall establish an operational expert group as referred to in Article 43(2)(d)(iii) of Regulation (EU) 2016/429.

2. The operational expert group shall assist the competent authority in:

(a) assessing the epidemiological situation and its evolution;

(b) determining the infected zone; and

(c) establishing the appropriate measures to be applied in the infected zone and their duration.

Article 108

Measures in the establishments within the infected zone

1. In the establishments keeping aquaculture animals of listed species within the infected zone, the competent authority shall apply the measures provided for in Article 87.

2. In addition to the measures provided for in Article 87, the competent authority shall prohibit the movement of aquaculture animals kept in establishments within the infected zone:

(a) out of the infected zone; or

(b) to other establishments in the infected zone.

3. The competent authority may, after carrying out a risk assessment, limit the prohibition in paragraph 2 to aquaculture animals of listed species.

4. By way of derogation from paragraph 2, the competent authority may authorise after carrying out a risk assessment and in agreement with the competent authority of the place of destination, the movement of animals of of listed species out of the infected zone or to other establishments in the infected zone.

Article 109

Duration of the measures in the infected zone

The competent authority shall maintain the measures provided for in this Chapter until the epidemiological information indicates that the relevant wild population no longer poses a risk of spreading the disease and the operational group recommends lifting the measures.

CHAPTER IV

Disease control measures for category B and C diseases of aquatic animals

Article 110

Preliminary disease control measures to be applied when a category B or C disease is suspected by the competent authority in Member States, zones or compartments that have been granted a disease free status

The competent authority shall apply the measures laid down in Articles 55, Article 56 and Article 57 of Delegated Regulation (EU) 2020/689 in the event of suspicion of a category B or C disease in accordance with Article 9(1), (3) or (4) of Delegated Regulation (EU) 2020/689, in Member States, zones or compartments that have been granted a disease free status as provided for in Article 36(4) and Article 37(4) of Regulation (EU) 2016/429, or Article 83, Article 84(1)(h) to (m) or Article 84(2)(b) to (g) of Delegated Regulation (EU) 2020/689.

Article 111

Disease control measures to be applied when a category B or C disease is confirmed

The competent authority shall apply the measures laid down in the Articles 58 to 65 of Delegated Regulation (EU) 2020/689 in the event of confirmation of a category B or C disease in accordance with Article 9(2), (3) or (4) of Delegated Regulation (EU) 2020/689 in Member States or zones or compartments that have been granted the disease free status as provided for in Article 36(4) and Article 37(4) of Regulation (EU) 2016/429, or Article 83, Article 84(1)(h) to (m) or Article 84(2)(b) to (g) of Delegated Regulation (EU) 2020/689:

PART IV

FINAL PROVISIONS

Article 112

Repeals

Directive 92/66/EEC, Directive 2001/89/EC, Directive 2003/85/EC and Directive 2005/94/EC as well as the acts adopted on the basis thereof, shall cease to apply with effect from 21 April 2021.

Article 113

Entry into force and application

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

It shall apply from 21 April 2021.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 17 December 2019.

For the Commission

The President

Ursula VON DER LEYEN

ANNEX I

CLINICAL EXAMINATIONS, SAMPLING PROCEDURES, DIAGNOSTIC METHODS OF CATEGORY A DISEASES AND TRANSPORT OF SAMPLES

(as referred to in Article 3 of this Regulation)

A. **Sampling procedures**

A.1 SAMPLING OF ANIMALS FOR CLINICAL EXAMINATIONS

1. Clinical examinations must include, if possible:
   (a) animals showing clinical signs of category A diseases;
   (b) animals likely to have recently died from the suspected/confirmed disease;
   (c) animals with epidemiological link to a suspected or confirmed case; and
   (d) animals that obtained positive or non-conclusive results in previous laboratory examinations.
2. Animals to examine must be selected at random, in a number large enough to allow the detection of the disease, if present, where there are no obvious signs of disease or post-mortem lesions suggesting category A diseases.
3. The animals to examine and the sampling method must be chosen in accordance with the instructions of the competent authority and with the relevant contingency plan as referred to in Article 43 of Regulation (EU) 2016/429. The animals to examine and the sampling method must take into account the disease profile and:
   (a) the purpose of the sampling;
   (b) the listed species kept in the establishment;
   (c) the number of animals of listed species kept in the establishment;
   (d) the category of the kept animals;
   (e) the available production, health and traceability records of the kept animals relevant for the investigation;
   (f) the type of establishment and the husbandry practices;
   (g) the level of exposure risk:
      (i) likelihood of exposure to the disease agent or to the vector;
      (ii) absence of immunisation of the animals due to vaccination or maternal immunity; and
      (iii) history of residence in the establishment;
   (h) other relevant epidemiological factors.
4. The minimum number of animals to examine must be in accordance with the instructions of the competent authority and with the relevant contingency plan as referred to in Article 43 of Regulation (EU) 2016/429. The minimum number of animals to examine must take into account the disease profile and in particular:
   (a) the expected prevalence in the establishment;
   (b) the level of confidence desired of the survey results, which in any case must not be lower than 95 %; and
   (c) international standards and available scientific evidence.

A.2 SAMPLING OF ANIMALS FOR LABORATORY EXAMINATIONS

1. Sampling for laboratory examinations must take into account the outcome of the clinical examinations referred to in point A.1 and, if possible, must include animals referred to in paragraph 1 of point A.1.

2. If there are no obvious signs of disease or post-mortem lesions suggesting category A diseases, samples must be collected at random in each epidemiological unit of the establishment and must allow the detection of the disease, if present.

3. The animals to sample, the nature of the samples to collect and the sampling method must be in accordance with the instructions of the competent authority and with the relevant contingency plan as referred to in Article 43 of the Regulation (EU) 2016/429. The animals to sample, the nature of the samples to collect and the sampling method must take into account the disease profile and the criteria set out in paragraph 3 of point A.1.

4. The minimum number of animals to sample must be in accordance with the instructions of the competent authority and the relevant contingency plan as referred to in Article 43 of the Regulation (EU) 2016/429. The minimum number of animals to sample must take into account the criteria set out in paragraph 4 of point A.1 and the performance of the tests used.

5. In the case of wild animals, samples must be collected from animals shot, found dead or purposely trapped or must be obtained on the basis of non-invasive methods such as salt licks and chewing ropes or baits. The minimum number and the nature of the samples must take into account the estimated size of the wild population and the relevant criteria set out in paragraph 3 and 4 of point A.1.

A.3 SAMPLING OF ESTABLISHMENTS FOR VISITS

1. The choice of establishments to sample and the sampling method must be in accordance with the instructions of the competent authority and with the relevant contingency plan as referred to in Article 43 of the Regulation (EU) 2016/429. The choice of establishments to sample and the sampling method must take into account the disease profile and the criteria set out in paragraph 3 of point A1.

2. The minimum number of establishments to visit must be in accordance with the instructions of the competent authority and with the relevant contingency plan, as referred to in Article 43 of the Regulation (EU) 2016/429.

B. **Diagnostic methods**

The techniques, reference materials, their standardisation and the interpretation of the results of tests carried out using the relevant diagnostic methods for category A diseases must comply with Article 6 and Part III of Annex VI to Delegated Regulation (EU) 2020/689.

The diagnostic methodology must aim to maximise the sensitivity of the surveillance. In certain circumstances this surveillance may include the use of laboratory examinations in order to assess previous exposure to disease.

C. **Transport of samples**

1. All samples taken to confirm or rule out the presence of a category A disease must be sent, with a proper labelling and identification, to an official laboratory which has been informed of their arrival. These samples must be accompanied by the appropriate forms, in accordance with the requirements established by the competent authority and the laboratory receiving the samples. These forms must include at least:

   (a) the establishment of origin of the sampled animals;

   (b) information on the species, age and category of the sampled animals;

   (c) the clinical history of the animals, if available and relevant;

   (d) the clinical signs and post-mortem findings; and

   (e) any other relevant information.

2. All samples must be:

   (a) stored in watertight and unbreakable containers and packages and in accordance with applicable international standards;

   (b) kept at the most appropriate temperature and other conditions during transport taking into account the factors that may affect the sample quality.

3. The exterior of the package must be labelled with the address of the recipient laboratory and the following message must be prominently displayed:

   '*Animal pathological material; perishable; fragile; do not open outside the laboratory of destination*.'

4. The person responsible in the official laboratory receiving the samples must be informed in due time of the arrival of the samples.

ANNEX II

MONITORING PERIOD

(as referred to in Articles 8, 17, 27, 32, 48, 57 and 59 of this Regulation)

Category A diseases	Monitoring period
Foot and mouth disease (FMD)	21 days
Infection with rinderpest virus (RP)	21 days
Infection with Rift Valley fever virus (RVFV)	30 days
Infection with lumpy skin disease virus (LSD)	28 days
Infection with *Mycoplasma mycoides subsp. mycoides SC* (Contagious bovine pleuropneumonia) (CBPP)	45 days
Sheep pox and goat pox (SPGP)	21 days
Infection with peste des petits ruminants virus (PPR)	21 days
Contagious caprine pleuropneumonia (CCPP)	45 days
African horse sickness (AHS)	14 days
Infection with *Burkholderia mallei* (Glanders)	6 months
Classical swine fever (CSF)	15 days
African swine fever (ASF)	15 days
Highly pathogenic avian influenza (HPAI)	21 days
Infection with Newcastle disease virus (NCD)	21 days

ANNEX III

CONDITIONS FOR CERTAIN DEROGATIONS FROM ARTICLE 12(1)(a) IN EQUINE ANIMALS

(as referred to in Article 13(4))

1. In the event of an outbreak of African horse sickness the competent authority may derogate from Article 12(1)(a) the affected and the unaffected animals, provided that:

   (a) the affected animals subject to the derogation are isolated in vector-protected premises which avoid any transmission of the disease agent from the animals to the relevant vectors until 40 days, corresponding to the infective period established in the relevant Chapter of the Terrestrial Animal Health Code of the World Organisation for Animal Health (OIE), have elapsed after the entry of the animals into the vector protected premises; and

   (b) surveillance, including if needed laboratory examinations, carried out by the competent authority, indicates that none of the animals in the vector protected premises poses a risk of virus transmission.

2. In the event of an outbreak of infection with *Burkholderia mallei* (Glanders) the competent authority may derogate from Article 12(1)(a) the unaffected animals, provided that the animals subject to the derogation are quarantined until:

   (a) the affected animals have been killed and destroyed;

   (b) after the killing, the cleaning and disinfection of the establishment has been completed as provided for in Article 15; and

   (c) the remaining animals have been subjected to a complement fixation test carried with negative result at a serum dilution of 1 in 5 on samples taken at least 6 months after the cleaning and disinfection referred to in point (b).

ANNEX IV

PROCEDURES FOR CLEANING, DISINFECTION AND WHEN NECESSARY CONTROL OF INSECTS AND RODENTS

(as referred to in Articles 12, 15, 16, 39, 45 and 57 of this Regulation)

A. **General requirements**

1. The choice of biocidal products and procedures for cleaning and disinfection operations must take into account:

   (a) the causal agent of infection;

   (b) the nature of the establishments, vehicles, objects and materials which are to be treated; and

   (c) the applicable legislation.

2. The conditions under which biocidal products are used must ensure that their efficacy is not impaired. In particular technical parameters provided by the manufacturer, such as pressure, temperature, required contact time or storage must be observed. The activity of the disinfectant must not be compromised by interaction with other substances.

3. Re-contamination of the previously cleaned parts must be avoided, in particular where washing is carried out with liquids applied under pressure.

4. The water used for cleaning operations must be contained and disposed of in a way that avoids any risk of spreading category A disease agents.

5. Biocidal products must be used in a way that reduces as much as possible any adverse impact on the environment and on public health that may arise from their use.

B. **Preliminary cleaning and disinfection**

For preliminary cleaning and disinfection under Article 15, to avoid spreading the category A disease:

(a) entire bodies or parts of dead kept animals of listed species must be sprayed with disinfectant and removed from the establishment, in closed and leak-proof vehicles or containers for processing and disposal;

(b) any tissue or blood which may have been spilled during killing, slaughter or post-mortem examination must be carefully collected and disposed of;

(c) as soon as the entire bodies or parts of dead kept animals of listed species have been removed for processing or disposal, the parts of the establishment in which these animals were kept and any parts of other buildings, surfaces or equipment contaminated during killing or post-mortem examination must be sprayed with disinfectant;

(d) manure, including litter and used bedding, must be thoroughly soaked with disinfectant;

(e) the disinfectant must remain on the treated surface for at least 24 hours;

(f) equipment, containers, consumption utensils, surfaces or any material likely to be contaminated after the washing and disinfecting must be destroyed.

C. **Final cleaning and disinfection:**

For final cleaning and disinfection for the purpose of Article 57:

1. Manure, including litter and used bedding, must be removed and treated as follows:

   (a) the solid phase of manure, including litter and used bedding, must either:

      (i) undergo a steam treatment at a temperature of at least 70 °C;

      (ii) be destroyed by burning;

(iii) be buried deep enough to prevent access by animals; or

(iv) be stacked to heat, sprayed with disinfectant and left for at least 42 days, during which the stack must be either covered or re-stacked to ensure thermic treatment of all layers;

(b) the liquid phase of manure must be stored for at least 42 days, and in the case of highly pathogenic avian influenza 60 days, after the last addition of infective material.

2. Buildings, surfaces and equipment must be thoroughly washed and cleaned by removing the remaining grease and dirt and sprayed with disinfectants.

3. After 7 days the establishments must be cleaned and disinfected again.

ANNEX V

MINIMUM RADIUS OF PROTECTION AND SURVEILLANCE ZONES

(as referred to in Article 21 of this Regulation)

Indicated as radius of a circle centred on the establishment

Category A diseases	Protection Zone	Surveillance Zone
Foot and mouth disease	3 km	10 km
Infection with rinderpest virus	3 km	10 km
Infection with Rift Valley fever virus	20 km	50 km
Infection with lumpy skin disease virus	20 km	50 km
Infection with *Mycoplasma mycoides subsp. mycoides SC* (Contagious bovine pleuropneumonia)	Establishment	3 km
Sheep pox and goat pox	3 km	10 km
Infection with peste des petits ruminants virus	3 km	10 km
Contagious caprine pleuropneumonia	Establishment	3 km
African horse sickness	100 km	150 km
Infection with *Burkholderia mallei* (Glanders)	Establishment	Establishment
Classical swine fever	3 km	10 km
African swine fever	3 km	10 km
Highly pathogenic avian influenza	3 km	10 km
Infection with Newcastle disease virus	3 km	10 km

ANNEX VI

PROHIBITIONS IN THE RESTRICTED ZONE

(as referred to in Article 27 of this Regulation)

Table: Prohibitions of activities concerning animals of listed species and products from those animals

PROHIBITIONS OF ACTIVITIES CONCERNING ANIMALS AND PRODUCTS	FMD (1)	RP	RVFV	LSD	CBPP	SPGP	PPR	CCPP	CSF	ASF	AHS	GLAND	HPAI	NCD
Movements of kept animals of listed species from establishments in the restricted zone	X	X	X	X	X	X	X	X	X	X	X	NA	X	X
Movements of kept animals of listed species to establishments in the restricted zone	X	X	X	X	X	X	X	X	X	X	X	NA	X	X
Restocking of game animals of listed species	X	X	X	X	X	X	X	X	X	X	X	NA	X	X
Fairs, markets, shows and other gatherings of kept animals of listed species including collection and dispersion of those species	X	X	X	X	X	X	X	X	X	X	X	NA	X	X
Movements of semen, oocytes and embryos obtained from kept animals of listed species from establishments in the restricted zone	X	X	X	X (*)	X	X	X	X	X	X	X	NA	NA	NA
Collection of semen, oocytes and embryo from kept animals of listed species	X	X	X	X	X	X	X	X	X	X	NP	NA	NA	NA
Itinerant artificial insemination of kept animals of listed species	X	X	X	X	X	X	X	X	X	X	X	NA	NA	NA
Itinerant natural service of kept animals of listed species	X	X	X	X	X	X	X	X	X	X	X	NA	NA	NA
Movements of hatching eggs from establishments in the restricted zone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	X	X
Movements of fresh meat excluding offal from kept and wild animals of listed species from slaughterhouses or game handling establishments in the restricted zone	X	X	X	NP	NP	X	X	NP	X	X	NP	NA	X	X

(1) Disease abbreviations in accordance with Annex II.
NA = Not applicable.
X = prohibition.
NP = Not prohibited.
(*) only oocytes and embryo.

PROHIBITIONS OF ACTIVITIES CONCERNING ANIMALS AND PRODUCTS	FMD (1)	RP	RVFV	LSD	CBPP	SPGP	PPR	CCPP	CSF	ASF	AHS	GLAND	HPAI	NCD
Movements of offal from kept and wild animals of listed species from slaughterhouses or game handling establishments in the restricted zone	X	X	X	X	X	X	X	X	X	X	NP	NA	X	X
Movements of meat products obtained from fresh meat of listed species from establishments in the restricted zone	X	X	X	NP	NP	NP	X	NP	X	X	NP	NA	X	X
Movement of raw milk and colostrum obtained from kept animals of listed species from establishments in the restricted zone	X	X	X	X	NP	X	X	NP	NA	NA	NP	NA	NA	NA
Movement of dairy products and colostrum based products from establishments in the restricted zone	X	X	X	X	NP	X	X	NP	NA	NA	NP	NA	NA	NA
Movement of eggs for human consumption from establishments in the restricted zone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	X	X
Movement of manure, including litter and used bedding from kept animals of listed species from establishments in the restricted zone	X	X	X	X	NP	X	X	NP	X	X	NP	NA	X	X
Movement of hides, skins, wool, bristles and feathers from kept animals of listed species from establishments in the restricted zone	X	X	X	X	NP	X	X	NP	X	X	NP	NA	X	X
Movement of feed material of plant origin and straw obtained in the protection zone (*)	X	X	NP	NP	NP	NP	NP	NP	NP	NP	NP	NA	NP	NP

(*) only oocytes and embryo.

ANNEX VII

RISK-MITIGATING TREATMENTS FOR PRODUCTS OF ANIMAL ORIGIN FROM THE RESTRICTED ZONE

(as referred to in Articles 27, 33 and 49 of this Regulation)

Treatment	FMD [1]	RP	RVFV	LSD	CBPP	SPGP	PPR	CCPP	CSF	ASF	AHS	HPAI	NCD
MEAT													
Heat treatment in an hermetically sealed container, to achieve a minimum F_0 [2] value of 3	x						X		X	X		X	X
Heat treatment to achieve a core temperature of 80 °C	X						X		X	X		X	X
Heat treatment to achieve a core temperature of 70 °C	X						X		X			X	X
Heat treatment (to meat previously de-boned and defatted) to achieve a core temperature of 70 °C for a minimum of 30 minutes	X						X		X				
In an hermetically sealed container, applying 60 °C for a minimum of 4 hours	X						X		X	X			
Core temperature of 73,9 °C for a minimum of 0,51 seconds [3]	X											X	X
Core temperature of 70,0 °C for a minimum of 3,5 seconds [3]												X	X
Core temperature of 65,0 °C for a minimum of 42 seconds [3]												X	X
Core temperature of 60 °C for a minimum of 507 seconds [3]												X	X
Heat treatment to achieve desiccation to maximum values of Aw of 0,93 and pH of 6													
Heat treatment to achieve a core temperature of 65 °C for a period of time to achieve a minimum pasteurisation value of 40							X						

[1] Disease abbreviations in accordance with Annex II.

[2] F_0 is the calculated killing effect on bacterial spores. An F_0 value of 3 means that the coldest point in the product has been heated sufficiently to achieve the same killing effect as 121 °C (250 °F) in three minutes with instantaneous heating and chilling.

[3] Only for poultry meat.

Treatment	FMD [1]	RP	RVFV	LSD	CBPP	SPGP	PPR	CCPP	CSF	ASF	AHS	HPAI	NCD
Natural fermentation and maturation for bone-in meat: minimum 9 months, to achieve maximum values of Aw of 0,93 and pH of 6	X								X				
Natural fermentation and maturation for de-boned meat: minimum 9 months, to achieve maximum values of Aw of 0,93 and pH of 6	X								X	X			
Natural fermentation for loins: minimum 140 days to achieve maximum values of Aw of 0,93 and pH of 6 [4]									X	X			
Natural fermentation for hams: minimum 190 days to achieve maximum values of Aw of 0,93 and pH of 6 [4]									X	X			
Drying after salting Italian style bone-in hams: minimum 313 days [4]									X				
Drying after salting Spanish style bone-in hams and loins [4]: — Iberian hams: minimum 252 days — Iberian shoulders: minimum 140 days — Iberian loins: minimum 126 days — Serrano hams: minimum 140 days	X								X	X			
Maturation of carcasses at a minimum temperature of 2 °C for a minimum of 24 hours following slaughter			X										
Removal of offal				X	X			X					
CASINGS													
Salting with sodium chloride (NaCl) either dry or as saturated brine (Aw < 0,80), for a continuous period of 30 days or longer at an ambient temperature of 20 °C or above	X			SC [5]			X		X	X			
Salting with phosphate supplemented salt 86,5 % NaCl, 10,7 % Na_2HPO_4 and 2,8 % Na_3PO_4 either dry or as saturated brine (Aw < 0,80) for a continuous period of 30 days or longer at an ambient temperature of 20 °C or above	X						X		X	X			
Salting with sodium chloride (NaCl) minimum 30 days [6]													

[4] Only for porcine animals.
[5] Safe commodity.
[6] Not for bovine, ovine, caprine and porcine casings.

Treatment	FMD [1]	RP	RVFV	LSD	CBPP	SPGP	PPR	CCPP	CSF	ASF	AHS	HPAI	NCD
Bleaching [7]													
Drying [7]													
MILK													
Heat treatment (sterilization process) to achieve a minimum F_0 value of 3	X				SC [8]			SC [8]					
Heat treatment UHT (Ultra high temperature): Minimum 132 °C for a minimum of 1 second	X						X						
Heat treatment UHT (Ultra high temperature): Minimum 135 °C for a suitable holding time	X												
Heat treatment HTST (High temperature short time pasteurisation) if milk pH is lower than 7, minimum 72 °C for a minimum of 15 seconds	X						X						
Heat treatment HTST (High temperature short time pasteurisation) if milk pH is 7 or higher, minimum 72 °C for a minimum of 15 seconds, applied twice	X						X						
Heat treatment HTST (High temperature short time pasteurisation) combined with a physical treatment to achieve pH value below 6 for a minimum of 1 hour or to achieve a minimum of 72 °C, combined with desiccation	X												
Pasteurisation consisting in a single heat treatment with an effect at least equivalent to that achieved by applying 72 °C for 15 seconds	X		X	X									

[7] Not for bovine, ovine, caprine and porcine casings.
[8] Safe commodity.

Treatment	HPAI	NCD
EGGS		
Heat treatment: — Whole egg: — 60,0 °C – 188 sec. — completely cooked — Whole egg blends: — 60 °C – 188 sec. — completely cooked — 61,1 °C – 94 sec. — Liquid egg white: — 55,6 °C – 870 sec. — 56,7 °C – 232 sec. — Plain or pure egg yolk: — 60 °C – 288 sec. — 10 % salted yolk: — 62,2 °C – 138 sec. — Dried egg white: — 67 °C – 20 hours — 54,4 °C – 50,4 hours — 51,7 °C – 73,2 hours	X	
Heat treatment: — Whole egg: — 55 °C – 2 521 sec. — 57 °C – 1 596 sec. — 59 °C – 674 sec. — completely cooked — Liquid egg white: — 55 °C – 2 278 sec. — 57 °C – 986 sec. — 59 °C – 301 sec. — 10 % salted egg yolk: — 55 °C – 176 sec. — Dried egg white: — 57 °C – 54,0 hours		X

ANNEX VIII

RISK-MITIGATING TREATMENTS FOR PRODUCTS NOT OF ANIMAL ORIGIN FROM THE PROTECTION ZONE

(as referred to in Articles 36 and 52 of this Regulation)

Treatment	FMD [1]	RP
Heat treatment, minimum temperature of 80 °C and for a minimum of 10 minutes, steam in a closed chamber	X	X
Storage in package or bales under shelter at premises situated not closer than 2 km to the nearest outbreak and releasing from the premises do not take place before at least three months have elapsed following the completion of cleaning and disinfection according to Article 15	X	X

[1] Disease abbreviations in accordance with Annex II.

ANNEX IX

MARKING OF FRESH MEAT FROM THE PROTECTION ZONE

(as referred to in Articles 33 and 49 of this Regulation)

1. The mark to be applied to fresh meat of poultry originating in the protection zone and not intended to another Member State pursuant to Article 33(1)(b) must comply with the following:

   (a) shape and content:

   Where 'XY' means the relevant country code provided for in point 6 of Part B of Section I of Annex II of Regulation (EC) No 853/2004 and '1234' means the approval number of the establishment referred to in point 7 of Part B of Section I of Annex II of Regulation (EC) No 853/2004;

   (b) dimensions:

   — 'XY' width of 8 mm,

   — '1234' width of 11 mm,

   — width outer diameter of not less than 30 mm,

   — line thickness of square of 3 mm.

2. The mark to be applied to fresh meat intended for treatment in a processing plant pursuant to Article 33(2)(a) shall consist in, either:

   (a) the identification mark provided for in Regulation (EC) No 853/2004 with an additional diagonal cross consisting of two straight lines intersecting at the centre of the stamp and enabling the information thereon to remain legible; or

   (b) a single oval stamp, 6,5 cm wide by 4,5 cm high, in which the following information must appear in perfectly legible characters:

   — on the upper part, the full name or ISO code of the Member State in capitals,

   — in the centre, the approval number of the slaughterhouse,

   — on the lower part, one of the following sets of initials CE, EC, EF, EG, EK, EY, EO, ES, EU, EB, WE or EZ,

   — two straight lines crossing at the centre of the stamp in such a way that the information is not obscured,

   — the letters must be at least 0,8 cm high and the figures at least 1 cm high.

ANNEX X

DURATION OF THE MEASURES IN THE PROTECTION ZONE

(as referred to in Article 39 of this Regulation)

Category A diseases	Minimum period of duration of measures in the protection zone (Article 39(1))	Additional period of duration of surveillance measures in the protection zone (Article 39(3))
Foot and mouth disease	15 days	15 days
Infection with rinderpest virus	21 days	9 days
Infection with Rift Valley fever virus	30 days	15 days
Infection with lumpy skin disease virus	28 days	17 days
Infection with *Mycoplasma mycoides subsp. mycoides SC* (Contagious bovine pleuropneumonia)	45 days	Not applicable
Sheep pox and goat pox	21 days	9 days
Infection with peste des petits ruminants virus	21 days	9 days
Contagious caprine pleuropneumonia	45 days	Not applicable
African horse sickness	12 months	Not applicable
Infection with *Burkholderia mallei* (Glanders)	6 months	Not applicable
Classical swine fever	15 days	15 days
African swine fever	15 days	15 days
Highly pathogenic avian influenza	21 days	9 days
Infection with Newcastle disease virus	21 days	9 days

ANNEX XI

DURATION OF THE MEASURES IN THE SURVEILLANCE ZONE

(as referred to in Articles 55 and 56 of this Regulation)

Category A diseases	Minimum period of duration of measures in the surveillance zone
Foot and mouth disease	30 days
Infection with rinderpest virus	30 days
Infection with Rift Valley fever virus	45 days
Infection with lumpy skin disease virus	45 days
Infection with *Mycoplasma mycoides subsp. mycoides SC* (Contagious bovine pleuropneumonia)	45 days
Sheep pox and goat pox	30 days
Infection with peste des petits ruminants virus	30 days
Contagious caprine pleuropneumonia	45 days
African horse sickness	12 months
Infection with *Burkholderia mallei* (Glanders)	Not applicable
Classical swine fever	30 days
African swine fever	30 days
Highly pathogenic avian influenza	30 days
Infection with Newcastle disease virus	30 days

ANNEX XII

SAMPLING PROCEDURES AND DIAGNOSTIC METHODS FOR CATEGORY A DISEASES IN AQUATIC ANIMALS

1. The following procedures apply to the clinical examination and collection of samples:

(a) the clinical examination and the sampling for laboratory examinations must include:

(i) aquaculture animals of listed species showing clinical signs of the relevant category A disease; and

(ii) aquaculture animals likely to have recently died from the suspected/confirmed category A disease; and

(iii) aquaculture animals with an epidemiological link to a suspected or confirmed case of a category A disease;

(b) the minimum number of samples to be collected is:

	Scenario			
Type of animals	Report of increased mortality	Introduction of infected animals	Post-mortem or clinical signs observed	Suspicion based on other circumstances
Molluscs (the whole animal)	30	30	—	150
Crustaceans	10		10	150
Fish	—	—	10	30

(c) the following additional criteria apply to the sampling of molluscs:

(i) animals suspected to be infected must be selected for sampling. If listed species are present in the population of animals concerned by the suspicion, those must be selected for sampling;

(ii) if weak, gaping or freshly dead but not decomposed molluscs are present, those must be selected first. If such molluscs are not present, the molluscs selected must include the oldest healthy molluscs;

(iii) if the establishment uses more than one water source for mollusc production, molluscs representing all water sources must be included for sampling to ensure that all parts of the establishment are proportionally represented in the sample;

(iv) when sampling from a group of mollusc farming establishments which apparently have identical epidemiological status, molluscs from a representative number of sampling points must be included in the sample.

The main factors to be considered when selecting those sampling points must be stocking density, water currents, the presence of listed species, both susceptible and vector species, bathymetry and management practices. Natural beds within or adjacent to the mollusc farming establishment(s) must be included in the sample;

(d) the following additional criteria apply when sampling crustaceans:

(i) if weak or moribund crustaceans of listed species are present in the production units, those crustaceans must be selected first. If such animals are not present, the crustaceans selected must include crustaceans of different year classes, proportionally represented in the sample;

(ii) if more than one water source is used for crustacean production, crustaceans of listed species representing all water sources must be included in the sample to ensure that all parts of the establishment are proportionally represented in the sample;

(iii) when collection of samples from wild populations of listed species is required under Article 102(a) of this Regulation, the number and geographical distribution of the sampling points must be determined in a way that ensures a reasonable coverage of the area suspected to be infected.

The sampling points must be representative for the different ecosystems where the wild populations of susceptible species are located such as marine, estuary, river and lake systems;

(e) the following additional criteria apply for sampling fish:

(i) if weak, abnormally behaving or freshly dead but not decomposed fish are present, those fish must be selected. If such animals are not present, the fish selected must include fish of listed species, belonging to different year classes, proportionally represented in the sample;

(ii) if more than one water source is used for fish production, listed species representing all water sources must be included for sampling to ensure that all parts of the establishment are proportionally represented in the sample;

(iii) if rainbow trout (*Onchorynchus mykiss*) or European perch (*Perca fluviatilis*) are present, only fish of those species may be selected for sampling. If neither rainbow trout nor European perch are present, the sample must be representative of all other listed species present, following the criteria in points (a) to (d);

(iv) when collection of samples from wild populations of listed species is required under Article 102(a) of this Regulation, the number and geographical distribution of the sampling points must be determined in a way that ensures a reasonable coverage of the area suspected to be infected.

The sampling points must also be representative of the different ecosystems where the wild populations of susceptible species are located such as marine, estuary, river and lake systems;

(f) the selection of organs to be sampled, preparation, storage and shipment of the samples to the laboratory must be carried out in compliance with recommendations from the European Union reference laboratory for the relevant disease.

2. Samples must be examined in the laboratory using the diagnostic methods and procedures approved by the European Union reference laboratory for the relevant disease.

ANNEX XIII

MINIMUM PERIODS OF FALLOWING OF AFFECTED AQUACULTURE ESTABLISHMENTS

Periods for the fallowing provided for in Article 81 and for the synchronous fallowing provided for in Article 96(4) and (5) of this Regulation

Category A disease	Minimum period of fallowing of the affected establishment	Minimum period of synchronised fallowing of affected establishments in the same protection zone	Supplementary requirements
Infection with *Mikrocytos mackini*	6 months	4 weeks	Must include the coldest period of the year
Infection with *Perkinsus marinus*	6 months	4 weeks	Must include the warmest period of the year
Infection with *Taura syndrome virus*	6 weeks	4 weeks	Must include the warmest period of the year
Infection with *Yellow head syndrome virus*	6 weeks	3 weeks	Must include the warmest period of the year
Epizootic haematopoietic necrosis	8 weeks	4 weeks	Must include the warmest period of the year

ANNEX XIV

CRITERIA FOR ESTABLISHING RESTRICTED ZONES AS REGARDS CATEGORY A DISEASES IN AQUATIC ANIMALS

1. Restricted zones as referred to in Article 85 must be defined on a case-by-case basis taking into account at least the following factors:

   (a) the accumulated number, the accumulated percentage and the distribution of the mortalities of molluscs/crustaceans/fish in the establishment or group of farming establishments infected with category A diseases;

   (b) relevant information regarding movements to and from the infected establishment(s);

   (c) the distance to and density of neighbouring establishments;

   (d) the presence of wild aquatic animals;

   (e) any knowledge concerning mortalities, suspected cases or outbreaks in wild aquatic animals which are, or could be related to the specific category A disease;

   (f) the proximity to processing establishments, and the species present at those establishments, especially as regards listed species;

   (g) farming practices applied in the affected and neighbouring establishments;

   (h) hydrodynamic conditions and other identified factors of epidemiological significance.

2. For the geographical demarcation of the protection and surveillance zones for category A diseases affecting molluscs and crustaceans, the following minimum requirements apply:

   (a) the protection zone must be established in the immediate vicinity of an establishment or group of farming establishments officially confirmed as infected with a category A disease and must correspond to an area determined according to appropriate hydrodynamic and epidemiological data;

   (b) the surveillance zone must be established outside the protection zone and must correspond to an area surrounding the protection zone, determined according to appropriate hydrodynamic or epidemiological data.

3. For the geographical demarcation of the protection and surveillance zones for category A diseases affecting fish, the following minimum requirements must apply:

   (a) the protection zone must be established around an establishment where *Epizootic hematopoietic necrosis* (EHN) has been confirmed. This zone shall correspond:

      (i) in coastal areas: to an area included in a circle with a radius of at least one tidal excursion or at least 5 km, whichever is larger, centred on the establishment in which EHN has been officially confirmed, or an equivalent area determined according to appropriate hydrodynamic or epidemiological data;

      (ii) in inland areas: to the entire water catchment area of the establishment in which EHN has been officially confirmed. The competent authority may limit the extension of the zone to parts of the water catchment area, or the area of the establishment, provided this does not compromise prevention of the spread of the disease;

   (b) the surveillance zone must be established by the competent authority outside the protection zone and must:

      (i) in coastal areas: correspond to an area, surrounding the protection zone, of overlapping tidal excursion; or an area, surrounding the protection zone, and included in a circle of radius 10 km from the centre of the protection zone; or an equivalent area determined according to appropriate hydrodynamic or epidemiological data;

      (ii) in inland areas: be an extended area outside the established protection zone.

ANNEX XV

SURVEILLANCE SCHEME AND DURATION OF CONTROL MEASURES IN THE SURVEILLANCE ZONE FOR CATEGORY ADISEASES IN AQUACULTURE ANIMALS

(as referred to in Articles 98 and 101 of this Regulation)

1. **Surveillance scheme**

The establishments and groups of aquaculture establishments keeping listed species within a surveillance zone must undergo surveillance as provided for in Article 98 to check for infection with the relevant category A disease. The surveillance must include health visits, including sampling from production units. Those visits must be carried out by the competent authority in accordance with Tables 1 and 2.

The criteria set out in point 1 of Annex XII, as appropriate for the species, apply to sampling.

Table 1

Scheme for surveillance comprising health visits and samplings in establishments and groups of establishments for category A diseases in aquatic animals, except epizootic hematopoietic necrosis

Category A disease	Number of health visits per year	Number of laboratory examinations per year	Number of animals in the sample	Period of the year for sampling	Residency period of the sampled animals in the establishment
Infection with *Mikrocytos mackini*	1	1	150	When the prevalence of infection is known to be maximal or April–May, after 3–4 months period when seawater temperatures are less than 10 °C	4 months
Infection with *Perkinsus marinus*	1	1	150	When the prevalence of infection is known to be maximal or in the month of September, October or November	4 months
Infection with *Taura syndrome virus*	2	2	150	In the period of the year when water temperature is likely to reach its highest annual level	2 months
Infection with *Yellow head syndrome virus*	2	2	150	In the period of the year when water temperature is likely to reach its highest annual level	2 months

Table 2

Specific scheme for surveillance comprising health visits and samplings in establishments for epizootic haematopoietic necrosis (EHN) in aquatic animals ([1])

Type of establishment	Number of health inspections per year (2 years)	Number of samplings per year (2 years)	Number of fish in the sample	
			Number of growing fish	Number of brood stock fish ([2])
(a) Establishments with broodstock	2	2	150 (first and second inspection)	150 (first or second inspection)
(b) Establishments with broodstock only	2	1	0	150 ([2]) (first or second inspection)
(c) Establishments without broodstock	2	2	150 (first and second inspection)	0
Maximum number of fish per pool: 10				

([1]) The sampling of fish for laboratory examination must be carried out whenever the water temperature is between 11 and 20 °C. The water temperature requirement must also apply to health inspections. In establishments where the water temperature does not reach 11 °C during the year, sampling and health visits must be carried out when the water temperature is at its highest level.

([2]) Samples from broodstock must not include gonadal fluids, milt or ova as there is no evidence of EHN causing reproductive tract infection.

2. **Duration of the control measures in the surveillance zone**

Category A disease	Minimum periods of surveillance
Infection with *Mikrocytos mackini*	3 years
Infection with *Perkinsus marinus*	3 years
Infection with *Taura syndrome virus*	2 years
Infection with *Yellow head syndrome virus*	2 years
Epizootic haematopoietic necrosis	2 years

When the period of surveillance has elapsed and there has been no new detection of infection with the relevant category A disease, the measures in the surveillance zone must be lifted as provided for in Article 101 of this Regulation.

DelReg2020/687 2404W

Proposed amendment to Commission Implementing Regulation (EU) 2020/687 as regards rules for the prevention and control of certain listed diseases.

Date : April 24th 2024

The Poultry Veterinary Study Group Europe (PVSGE) welcomes the opportunity to comment on the above topic.

The PVSGE is a formally constituted group of about 90 European specialised poultry veterinarians, with practical responsibility for the health, welfare, production and food safety aspects of most European poultry production. PVSGE has existed for over 50 years and the members are mostly working as private practitioners or are sometimes working for a company (breeding companies, integrations, hatcheries, pharmaceutical companies). Full-time government veterinarians are not eligible for membership. The following 23 countries are currently represented in the PVSGE: Austria, Belgium, Bulgaria, Cyprus, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Ireland, Italy, Latvia, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland. This document has been prepared by the PVSGE Legislation Working Group.

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Background

From 2006 to April 2021 measures for the control of avian influenza were laid down in Council Directive 2005/94[1]. Detailed measures were laid down for protection zones and surveillance zones. Articles 29 and 31 laid down the duration of actions in zones as respectively 21 days (protection) and 30 days (surveillance), timing of the lifting of these zones from completion of preliminary cleaning and disinfection of infected holdings. This directive was replaced on 21/04/2021 by the general Animal Health Law[2], and a supplemental commission delegated regulation 2020/687[3] (DR687) dealing with rules for the prevention and control of the listed animal diseases. The rules are not specific to avian diseases but lay down general principles which affect control measures. Both Avian Influenza and Newcastle disease are included as listed diseases to which this regulation applies. The existing legislation is clear, in articles 39 and 55, that the intention was that zonal restrictions around cases would be lifted at 30 days after 'preliminary cleaning and disinfection' of the final case assuming no further cases were identified in the zones as a result of the required surveillance. The purpose of preliminary C&D is to avoid the spread of the Category A disease (DR687 Annexe IV para B) and thus should be equivalent to completion of the stamping out process as required by WOAH. It is equally clear that restocking on affected sites under EU regulations requires the enhanced 'secondary cleaning and disinfection' which requires the removal of litter or manure, and 2 process of disinfection separated by 7 days. Here we focus on the specific proposal made but we must recognise that decisions made in relation to this are very likely to impact the area of trade with third countries if they constrain the ability of EU countries in the closure of disease events for WOAH purposes. Reports to WOAH and notifications of country freedom have no impact on intra-EU trade and so should continue to be governed by the principle of subsidiarity[4]. Inconsistencies may arise between countries in relation to such reporting but this is a matter for discussion between stakeholders and their respective competent authorities and within WOAH.

Proposal

Amendment proposed by the EU Commission in December 2023

Change of Article 55(1) of DR687:

To introduce new point (d) adding the condition to complete final cleaning and disinfection before lifting disease control measures.

The justification given is " *Add clarity and ensure consistency with Article 68 of AHL*[3]. This article deals with "Maintaining disease control measures in restricted zones and delegated acts" and states in sub-para 1(b)

"the **final** cleaning, disinfection, control of insects and rodents, or other necessary biosecurity measures has been carried out as appropriate for:

(i) the listed disease referred to in point (a) of Article 9(1) for which the disease control measures have been applied;

(ii) the affected species of kept animals;

(iii) the type of production "

Our Position

The PVSG **strongly *opposes*** *the proposed change in Art 55 of DR687****,*** *given the success, over many years, of lifting zonal restrictions based on* ***preliminary C&D*** .

This proposal would, in fact, be inconsistent with article 39(1) of the same regulation. The real problem, we believe, lies with the inclusion of 'final' in relation to cleaning and disinfection in Article 68 of the AHL[2] sub-para 1(b)

We would like to emphasize that affected sites after preliminary C&D are not producing significant disease risk, since viruses do not grow in the absence of a host. In relation to the listed poultry diseases the affected sites are fully depopulated and so cannot contribute to any risk of spread (intra-EU or to 3rd country) of disease via products. It should also be noted that if EU-mandated control zones remain in place longer than necessary this sends a message to trading partners that the disease has not been effectively controlled, as well as making it difficult for member state competent authorities to properly comply with their obligations under the WOAH Terrestrial Code to ensure "the safety of international trade in animals and animal products, <u>while avoiding unjustified sanitary barriers</u>"[5].

Our members would like, as an alternative to the Commission proposal, to ***call on the Commission to add a sub-paragraph to article 55, as follows :*** **"d. Completion of preliminary cleaning and disinfection is regarded as the completion of the stamping out process, but movement restrictions must continue to be applied to the affected property, and any susceptible animals and type of production on it, until completion of final cleaning and disinfection."** Furthermore we propose the **deletion of 'final' from Article 68, sub-para's 1(b) and 2(a**) of the AHL to remove the current inconsistency. Poultry farmers around the EU have experienced serious implications for several years due to HPAI, in part as a result of the control mechanisms implemented under EU law. Where there is a complete ban for placing of day old chicks or hatching eggs for on farm hatching within 3 km, an outbreak does indeed cause serious economic damage to the farms/farmers situated within a zone. The current 21/30 days restrictions after preliminary C&D are more than sufficient for disease control purposes. This Commission proposal could easily extend zonal restrictions for 1-3 months, and sometimes much longer (depending on the type of farm and difficulty of achieving secondary C&D to the satisfaction of the competent authority), exacerbating the economic damage of the disease, for negligible benefit.

Eva Berndtson	President	_____
Matthias Voss	Senior Vice President	_____
Pia Gustavsson	Chair Legislation Working Group	_____
Gerard Leveque	Secretary, Legislation Working Group	_____

Appendix 1 - Relevant legislation Extracts

Regulation (EU) 2016/429 of the European Parliament and of the Council of 9 March 2016 on transmissible animal diseases and amending and repealing certain acts in the area of animal health ('Animal Health Law')

Article 68

Maintaining disease control measures in restricted zones and delegated acts

1. The competent authority shall continue to apply the disease control measures provided for in this Section until the following conditions are met:

(b) "the **final** cleaning, disinfection, control of insects and rodents, or other necessary biosecurity measures has been carried out as appropriate for:

(i) the listed disease referred to in point (a) of Article 9(1) for

which the disease control measures have been applied;

(ii) the affected species of kept animals;

(iii) the type of production "

2. The Commission shall adopt delegated acts in accordance with Article 264 concerning detailed rules for the disease control measures to be taken by the competent authority, as provided for in paragraph 1, in relation to:

(a) the **final** procedures for cleaning, disinfection, control of insects and rodents, or other necessary biosecurity measures and, where appropriate, the use of biocidal products for those purposes;

COMMISSION DELEGATED REGULATION (EU) 2020/687 - supplementing Regulation (EU) 2016/429 of the European Parliament and the Council, as regards rules for the prevention and control of certain listed diseases[2]

Section 2

Disease control measures in the event of the official confirmation of a category A disease in kept animals

Article 15

Preliminary cleaning and disinfection and control of insects and rodents in the affected establishment

1. Immediately after the completion of the measures provided for in Article 12, and when relevant in Article 14, the competent authority shall order and supervise a preliminary cleaning and disinfection and, when relevant, control of insects and rodents, in the affected establishment in order to avoid spreading of the category A disease.

2. The preliminary cleaning, disinfection and control referred to in paragraph 1 shall be:

(a) performed in accordance with the procedures set out in points A and B of Annex IV using the appropriate biocidal products to ensure destruction of the relevant category A disease agent; and

(b) adequately documented.

3. When the competent authority grants one of the derogations provided for in Article 13(2) and (4), it shall order the preliminary cleaning, disinfection and the control referred to in paragraph 1 adapting the procedures referred to in point 2(a) to the specific situation without detriment to the control of spreading of the category A disease from the affected animals and affected establishments and locations to other unaffected animals or to humans.

4. In addition to the measures referred to in paragraphs 1 and 2, the competent authority shall order and supervise that the means of transport used for the transport of animals to and from the affected establishment are properly cleaned and disinfected and, where relevant, subjected to measures ensuring the control of insects and rodents

Article 16

Derogations and special rules for the preliminary cleaning and disinfection and control of vectors

The competent authority may grant derogation to the requirement regarding cleaning and disinfection and control of insects and rodents set out in Article 15 in the case of:

(a) pastures epidemiologically linked to the affected establishment, under specific procedures to ensure effective inactivation of the relevant category A disease agent taking into account the disease profile, the type of establishment and the climatic conditions; and

(b) manure, including litter and used bedding, from the affected establishment, under specific procedures to ensure effective inactivation of the relevant category A disease agent in accordance with scientific evidence.

Section 1

General disease control measures in the restricted zone

Section 2

Disease control measures in the protection zone

Article 39

Duration of the disease control measures in the protection zone

1. The competent authority may lift the measures provided for in Section 1 and 2 of this Chapter only if the minimum

period set out in Annex X has elapsed and the following conditions are fulfilled:

(a) the preliminary cleaning and disinfection and, where relevant, control of insects and rodents, has been performed in

accordance with Article 15 in the affected establishment; and

(b) in all establishments keeping animals of listed species in the protection zone, animals of listed species have undergone,

with favourable results, clinical and when necessary laboratory examinations in accordance with Article 26.

2. Where the relevant category A disease is transmitted by a listed vector, as referred to in Regulation (EU) 2018/1882,

the competent authority may:

(a) establish the duration of the measures in the protection zone on a case by case basis, taking into account any factor

influencing the risk of the disease spreading; and

(b) provide for the introduction of sentinel animals.

3. After the lifting of the measures referred to in paragraph 1, the measures provided for in Section 3 of this Chapter shall

apply in the protection zone for at least the additional period set out in Annex X.

CHAPTER III

Repopulation with terrestrial animals of establishments in restricted zones

Article 57

Conditions to authorise the repopulation of the affected establishment

1.

The competent authority shall only authorise the repopulation of the affected establishment if the following requirements are met:

(a) a final cleaning and disinfection and, when relevant, control of insects and rodents has been:

(i) carried out, in accordance with the procedures set out in points A and C of Annex IV, using the appropriate biocidal products to ensure destruction of the relevant category A disease agent; and

(ii) adequately documented;

(b) the monitoring period set out in Annex II for the relevant disease, calculated forwards from the date on which the final cleaning and disinfection provided for in point (a) was carried out, has elapsed.

2. The competent authority shall supervise that the final cleaning and disinfection and, when relevant, control of insects and rodents in the affected establishment is carried out in compliance with the requirements in paragraph 1(a).

3. The competent authority shall not allow access to a pasture of kept animals of listed species during the period of time during which it is considered contaminated; this period of time shall be established after carrying out a risk assessment.

4. Where for duly justified reasons the final cleaning and disinfection and, when relevant, the control of insects and rodents referred to in paragraph 1, have not been entirely accomplished in the affected establishment, the competent authority may authorise the repopulation by way of derogation from paragraph 1, provided that:

(a) a period of at least 3 months has elapsed since the preliminary cleaning and disinfection, as referred to in Article 15, was performed; and

(b) prior to granting the authorisation, the competent authority has assessed the risks deriving from that authorisation and the assessment indicates that the risk of spreading the category A disease is negligible.

Annex IV para B

Preliminary cleaning and disinfection

For preliminary cleaning and disinfection under Article 15, to avoid spreading the category A disease:

(a) entire bodies or parts of dead kept animals of listed species must be sprayed with disinfectant and removed from the establishment, in closed and leak-proof vehicles or containers for processing and disposal;

(b) any tissue or blood which may have been spilled during killing, slaughter or post-mortem examination must be carefully collected and disposed of;

(c) as soon as the entire bodies or parts of dead kept animals of listed species have been removed for processing or disposal, the parts of the establishment in which these animals were kept and any parts of other buildings, surfaces or equipment contaminated during killing or post-mortem examination must be sprayed with disinfectant;

(**d) manure, including litter and used bedding, must be thoroughly soaked with disinfectant;**

(e) the disinfectant must remain on the treated surface for at least 24 hours;

(f) equipment, containers, consumption utensils, surfaces or any material likely to be contaminated after the washing and disinfecting must be destroyed.

ANNEX IV

PROCEDURES FOR CLEANING, DISINFECTION AND WHEN NECESSARY CONTROL OF INSECTS AND RODENTS

(as referred to in Articles 12, 15, 16, 39, 45 and 57 of this Regulation)

A. General requirements

1. The choice of biocidal products and procedures for cleaning and disinfection operations must take into account:

(a) the causal agent of infection;

(b) the nature of the establishments, vehicles, objects and materials which are to be treated; and

(c) the applicable legislation.

2. The conditions under which biocidal products are used must ensure that their efficacy is not impaired. In particular technical parameters provided by the manufacturer, such as pressure, temperature, required contact time or storage must be observed. The activity of the disinfectant must not be compromised by interaction with other substances.

3. Re-contamination of the previously cleaned parts must be avoided, in particular where washing is carried out with liquids applied under pressure.

4. The water used for cleaning operations must be contained and disposed of in a way that avoids any risk of spreading category A disease agents.

5. Biocidal products must be used in a way that reduces as much as possible any adverse impact on the environment and on public health that may arise from their use.

B. Preliminary cleaning and disinfection

For preliminary cleaning and disinfection under Article 15, to avoid spreading the category A disease:

(a) entire bodies or parts of dead kept animals of listed species must be sprayed with disinfectant and removed from the establishment, in closed and leak-proof vehicles or containers for processing and disposal;

(b) any tissue or blood which may have been spilled during killing, slaughter or post-mortem examination must be carefully collected and disposed of;

(c) as soon as the entire bodies or parts of dead kept animals of listed species have been removed for processing or disposal, the parts of the establishment in which these animals were kept and any parts of other buildings, surfaces or equipment contaminated during killing or post-mortem examination must be sprayed with disinfectant;

(d) manure, including litter and used bedding, must be thoroughly soaked with disinfectant;

(e) the disinfectant must remain on the treated surface for at least 24 hours;

(f) equipment, containers, consumption utensils, surfaces or any material likely to be contaminated after the washing and disinfecting must be destroyed.

C. Final cleaning and disinfection:

For final cleaning and disinfection for the purpose of Article 57:

1. Manure, including litter and used bedding, must be removed and treated as follows:

(a) the solid phase of manure, including litter and used bedding, must either:

(i) undergo a steam treatment at a temperature of at least 70 °C;

(ii) be destroyed by burning;

(iii) be buried deep enough to prevent access by animals; or

(iv) be stacked to heat, sprayed with disinfectant and left for at least 42 days, during which the stack must be either covered or re-stacked to ensure thermic treatment of all layers;

(b) the liquid phase of manure must be stored for at least 42 days, and in the case of highly pathogenic avian influenza 60 days, after the last addition of infective material.

2. Buildings, surfaces and equipment must be thoroughly washed and cleaned by removing the remaining grease and dirt and sprayed with disinfectants.

3. After 7 days the establishments must be cleaned and disinfected again.

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This page was last edited on 30 April 2024, at 08:50.

A PROFILE OF THE SOUTH AFRICAN OSTRICH MARKET VALUE CHAIN

2021

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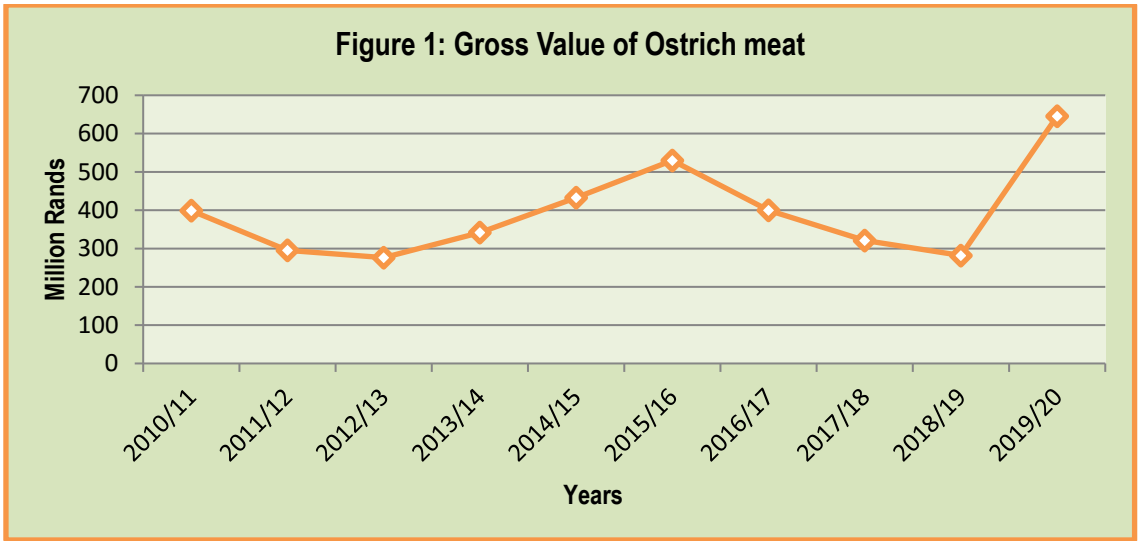
1. DESCRIPTION OF THE INDUSTRY

South Africa dominated the ostrich industry worldwide with 75% of global market share. Ostrich is characterized by three product phases, *i.e.* meat, leather and feathers and the current main source of income is meat and leather. The value of a slaughtered ostrich is broken down into 45% skin, 45% meat and 10% feather. This contrasts with Europe, where the breakdown is 75% meat and 25% skin. This is because of the popular healthy aspects that ostrich meat contains the lowest fat and cholesterol and is rich in protein and iron. South Africa has a unique ability with ostriches. A few decades ago, the country was the sole producer of farmed ostriches in the world and this monopoly was guarded by a law that made it illegal to export live birds. However, with the liberalisation of agriculture, the legal restriction was lifted and many other countries imported South African ostriches to start their own industries.

In South Africa, ostriches require dry climate, especially for breeding. Therefore, ostrich farming is more suitable in the western drier parts of the country or in winter rainfall regions. The industry dominates in the Western Cape in the Klein Karoo and Southern Cape regions. Oudsthoorn district in the Western Cape is called the ostrich capital due to the number of ostriches slaughtered and the value added products from this area.

The gross value of production of ostrich products is dependent on the quantity produced and the prices received by producers. Figure 1 below show the gross value of ostrich production over the past ten years.



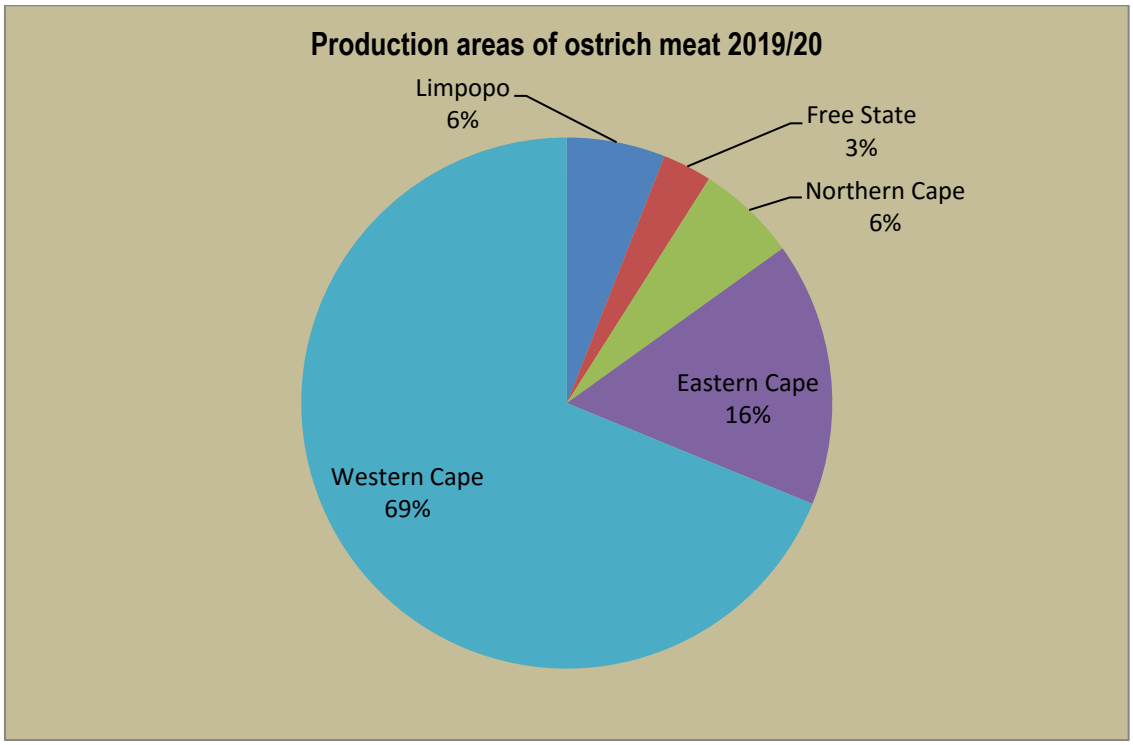
Source: Statistics and Economic Analysis, DALRRD

The average gross value of ostrich production amounted to R392.3 million per annum over the past ten years. The gross value of ostrich production was on first peak in 2015/16 at approximately R529.8 million and a second peak in 2019/20 at R645.5 million. The drastic decreases experienced from 2010/11 to 2012/13 were due to the outbreak of Avian Influenza (also known as bird flu) (AI) in April 2011 that caused the producers to lose main markets. The figure shows that the gross value of production reached its minimum in 2012/13 at approximately R276 million. In 2014, the gross value of ostrich production started to recover. South Africa experienced another AI outbreak in 2017 that led the gross value to drop from 2015/16 to 2018/19. In 2019, the ban imposed by the main markets (European Union) were lifted hence the 129% increase in gross value in 2019/20.

1.1. PRODUCTION AREAS

At least 70% of the world ostriches are found in South Africa while 90% of the produced products (feathers, meat and leather) is exported. Ostriches are produced in few provinces of South Africa.

Figure 2 below show the production areas of ostriches in South Africa.



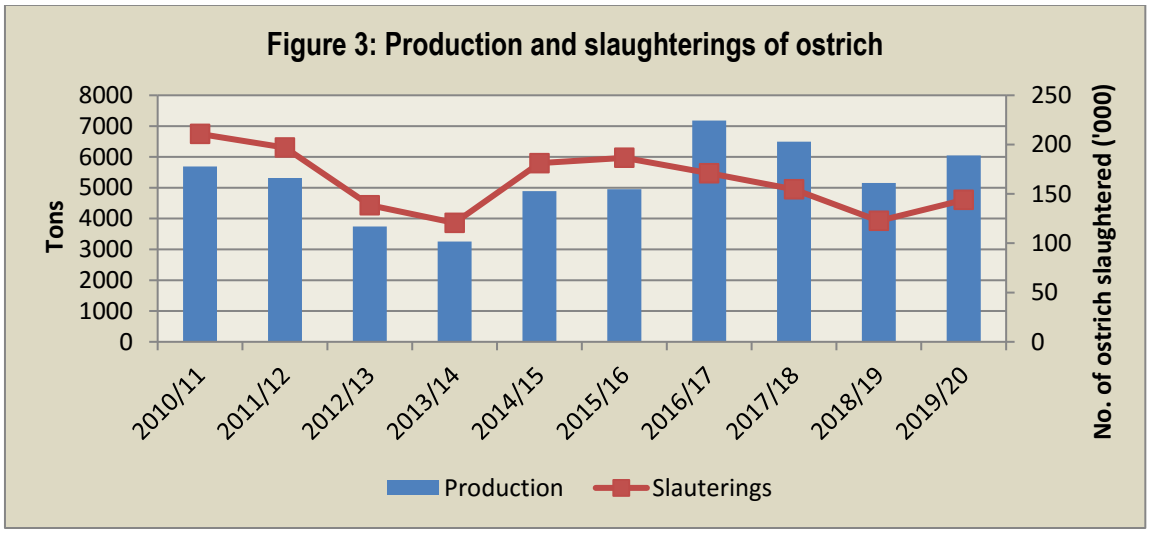
Source: SAOBC

According to Figure 2 above, 69% of the ostriches are found in the Western Cape, with the Klein Karoo dominating the production. Eastern Cape Province followed with a share of 16%. Limpopo, Northern Cape and Free State presented a production share of about 6%, 6% and 3% respectively in 2019/20. Oudtshoorn in the Klein Karoo of the Western Cape is regarded as the ostrich capital of the world.

1.2. PRODUCTION TRENDS

Local ostrich activities have spread from the Klein Karoo region (which maintains its prominent role) into the Eastern Cape, as well as to the Limpopo and Northern Cape. South Africa has about 588 registered export farms of which 453 farms are in the Western Cape, 102 in the Eastern Cape and 33 farms in the rest of the country. There are 8 European Union approved export abattoirs. Out of the 10 tanneries for exotic leather like crocodile, snake, game and ostrich, two are dedicated to ostrich. Most ostriches go to slaughter at 10 –14 months of age, produce about 27 kg of meat, 4.2 m^2 of leather and 1 kg of feathers.

Figure 3 below indicate production of ostrich meat in South Africa from 2010/11 to 2019/20.

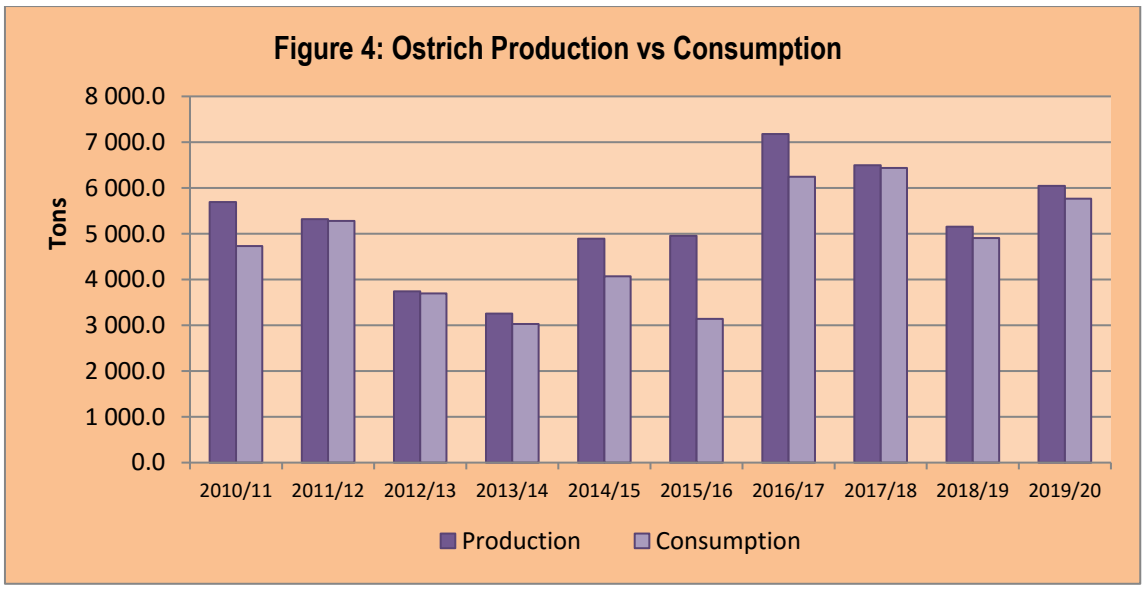


Source: Statistics and Economic Analysis, DALRRD and SAOBC

The production and slaughtering of ostrich has been fluctuating over the past decade. The production and slaughtering of ostrich meat was high in 2010/11 until it start dropping from 2011/12 to 2013/14 production season. The decline was due to the outbreak of Avian Influenza in 2011, which led to the culling of 50 000 ostriches. The number of ostrich slaughtered declined and observably affected production. From 2014/15, production increased following the lifted export ban however remained constant in 2015/16 due to severe drought in South Africa. The figure indicate that the maximum (peak) production of ostrich meat was reached in 2016/17 at approximately 7 179 tons. As the industry recover in 2016/17 with an increase in production, there was another AI outbreak in 2017 which led production and slaughtering of ostrich decline until 2018/19. During 2019, the import ban was lifted which reflect in the increased production in 2019/20.

1.3. LOCAL CONSUMPTION

Figure 4 below depicts local consumption of ostrich meat compared to the total production for each year to determine if the country is self–sufficient.



Source: Statistics and Economic Analysis and Quantec

Production and consumption of ostrich meat has been fluctuating over the past decade. Figure 4 indicates that South Africa produces more than local demand of ostrich meat which makes the country self-sufficient and net exporter of ostrich products. The drastic increase experienced during 2011/12 and 2016/17 to 2017/18 on local consumption was due to the fact that ostrich producers decided to explore the local market because of the ban of ostrich meat to the EU. Local consumption comes in all sorts of forms, with wors (sausage) and biltong (dried and spiced meat) being among the favourites. Production of ostrich meat constituted 65% of income derived from an ostrich. From 2015/16 to 2017/18, the production shows a declining trend while consumption is increasing. In 2019/20, both production and consumption experienced an increase of 17% each.

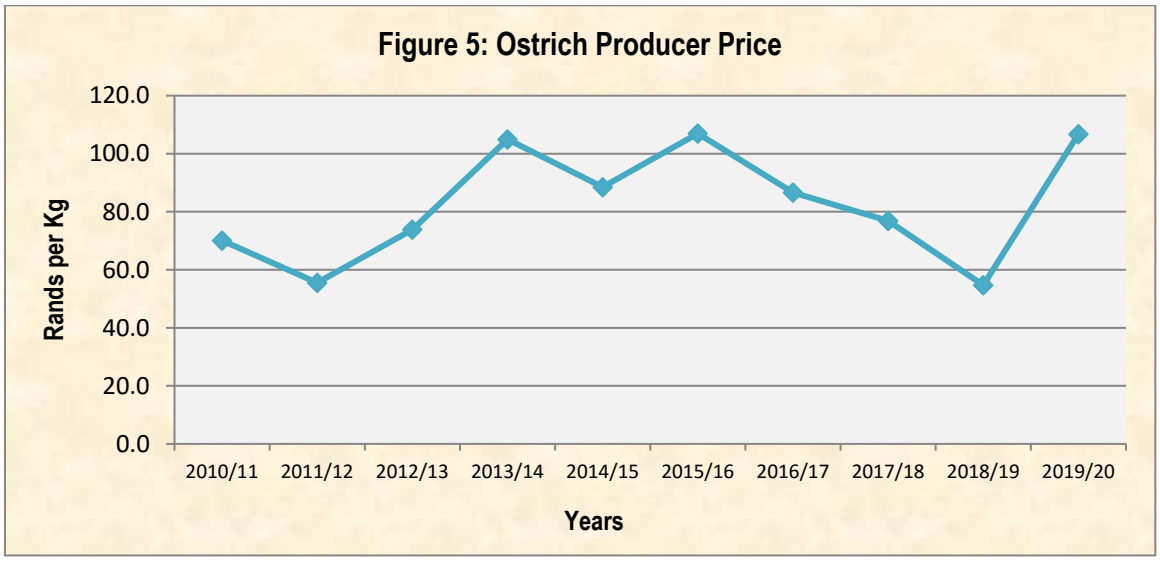
1.4. EMPLOYMENT

Resuming the exports of ostrich to South African main market (European Union) due to ending of a four-year ban will contribute in increasing of jobs. The jobs will increase mainly in Western Cape as the province produce about 75% of ostrich. Currently, the industry creates approximately 20 000 direct jobs in South Africa's rural areas.

2. MARKET STRUCTURE

2.1. DOMESTIC MARKET

Ostrich products were sold through the Klein Karoo Co-operative in "one channel marketing system" until November 1993. The farmers promoted this system to ensure protection and a satisfactory income since the industry was not governed by a Control Board. In November 1997, the "one channel marketing system" was replaced by a free market system. The prices are determined by forces of demand and supply. Since deregulation 9 new abattoirs were built, namely; Mosstrich, Grahamstown Ostrich Abattoir, Swartland Ostriches, Camdeboo Meat Processors Ltd, Exon, Marowe (Pty) Ltd, Philippe Genuine Ostrich Products and Camexo. Figure 5 below show the average ostrich meat prices by abattoirs.

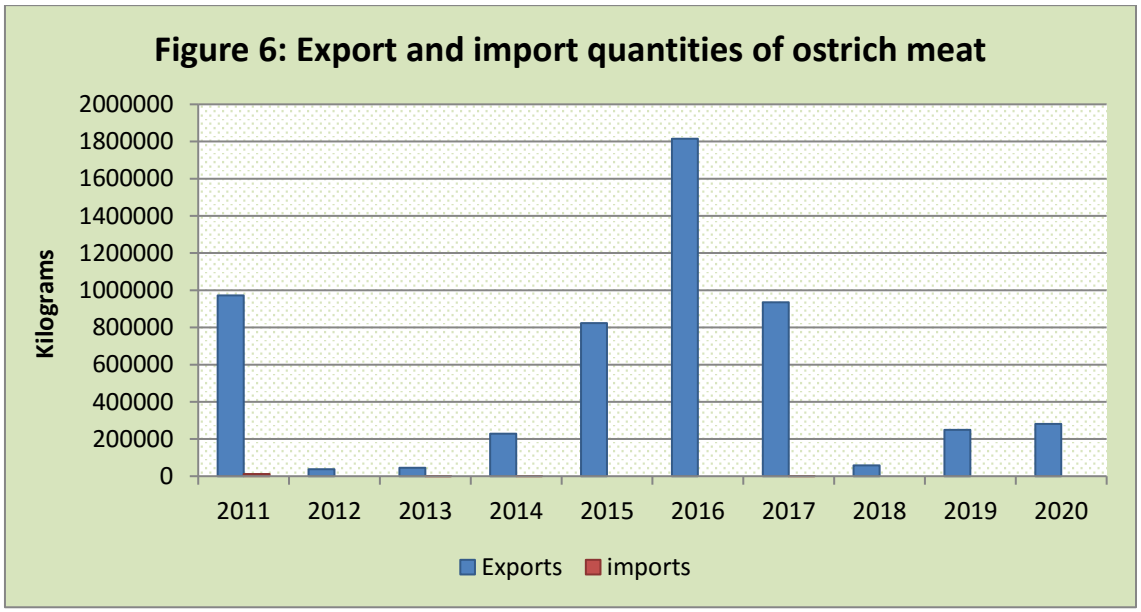


Source: Statistics and Economic Analysis, DALRRD and SAOBC

The producer price of ostrich meat has been fluctuating throughout the period under analysis. The trend shows an immense increase from 2011/12 to 2013/14. The price of ostrich meak per kilogram reached its peak (R106.90) in 2015/16. The trend shows that prices then declined until 2018/19 reaching the lowest (R54.70) price in the past decade. Producer prices increased by 95% in 2019/20 emanating from opening of export market which reduced the local supply.

2.2 IMPORT- EXPORT ANALYSIS OF OSTRICH

Figure 6 below compares the quantities of imports and exports for ostrich from 2011 to 2020.



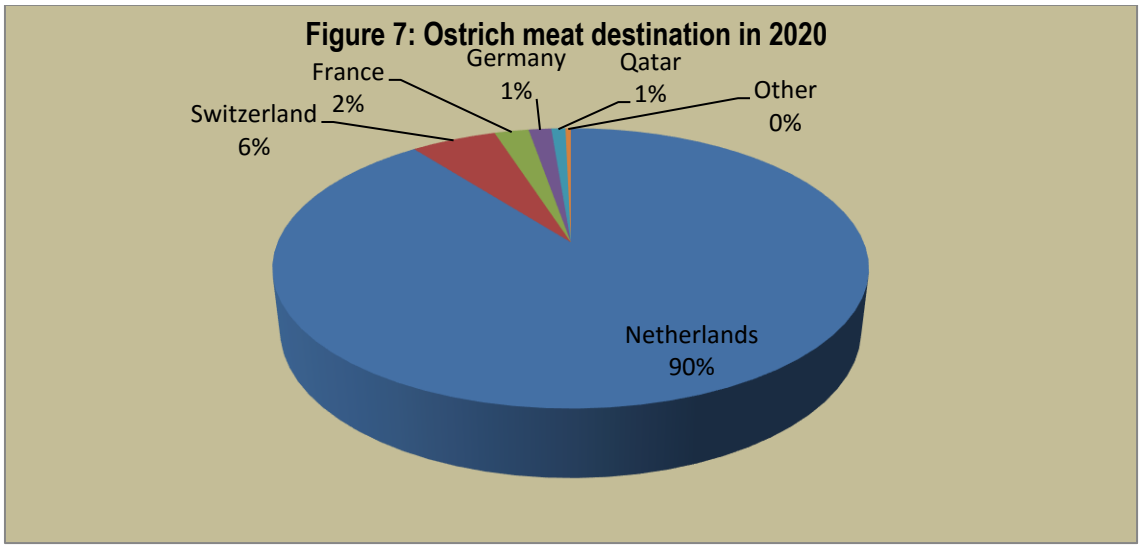
Source: *Quantec*

It is clearly indicated from Figure 6 above that South Africa has been a net exporter of ostrich throughout the entire period of analysis. The export quantities are far higher than import quantities although exports experienced a drastic decrease from 2012 to 2014 due to the ban of ostrich meat in the EU market. However in 2015, South Africa was declared disease free, hence the exports picked up in 2015 and 2016. The exports of ostrich reached the peak in 2016 at 1.8 million kilograms and this was due to the increased production reaching 6 244 tons of ostrich during the same period. The export of fresh ostrich meat was banned following another outbreak of avian influenza in June 2017. This has led to a decrease of ostrich exports meat by 48% in 2017 and 94% in 2018. This may also be attributed by the production decline during those years. In 2019, the EU has lifted the import ban of ostrich meat from South Africa. This has resulted in exports increasing by 325% in 2019 and 13% in 2020. The imports of ostrich was zero from 2018 to 2020.

2.2.1 EXPORTS OF OSTRICH MEAT

The ostrich industry is an important earner of foreign exchange through the export of ostrich meat, leather and feathers. Prior to the ban of ostrich meat and products in 2011, exports contributed approximately R1.2 billion annually. Most of the ostrich meat exported is fillet. Ostrich meat is extremely popular in Europe due to its health characteristics (low in cholesterol and fat). Prior and subsequent to the ban, the European Union was the largest consumer of South Africa's ostrich meat and also South Africa's major export destination, which account for almost 80%. The remaining is exported to the Far East Asia and Africa.

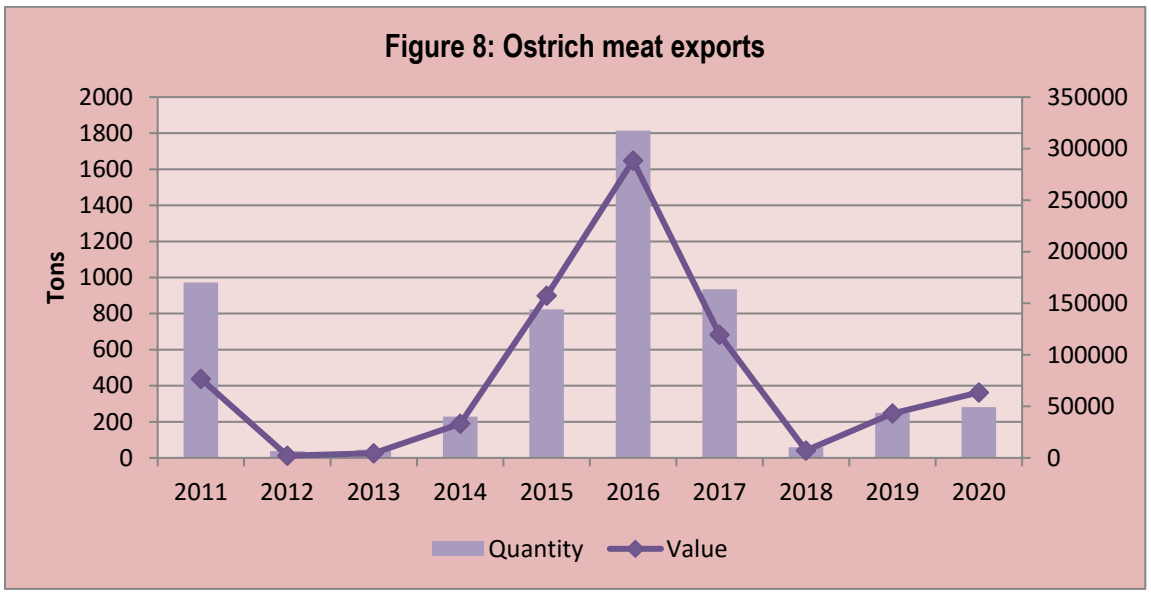
Figure 7 below show the export destinations of ostrich during 2020.



Source: *Trade map*

During 2020, South Africa exported more ostrich meat to Netherlands accounting for a share of 90% followed by Switzerland (6%), France (2%) and Germany (1%). Qatar accounted for 1%. Other countries together accounted for less than 1% share of South African ostrich meat in 2020.

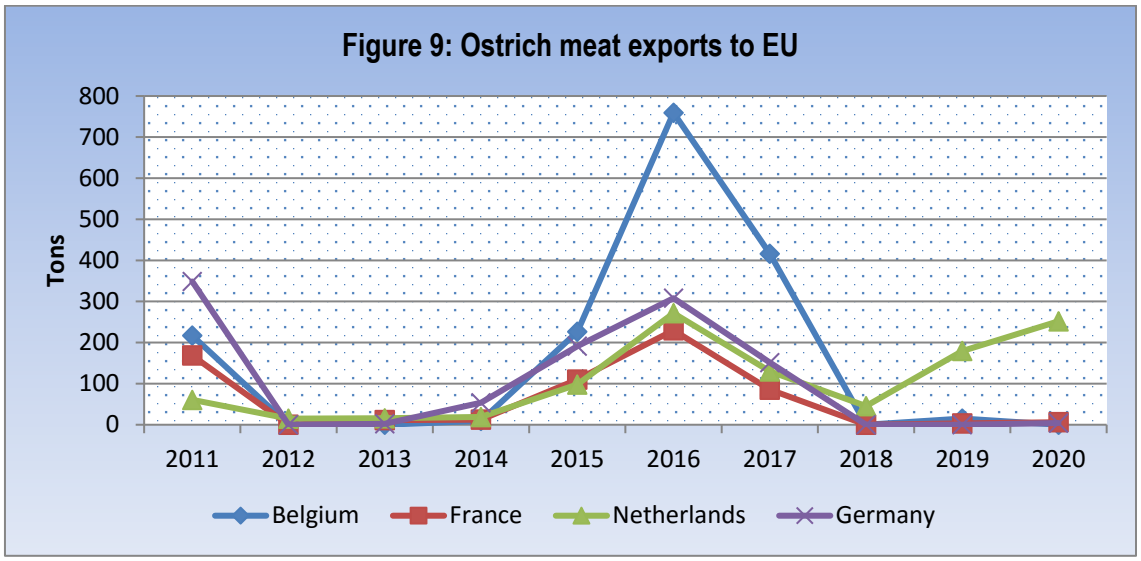
Figure 8 below presents the meat export in quantity and value from 2011 to 2020.



Source: *Quantec*

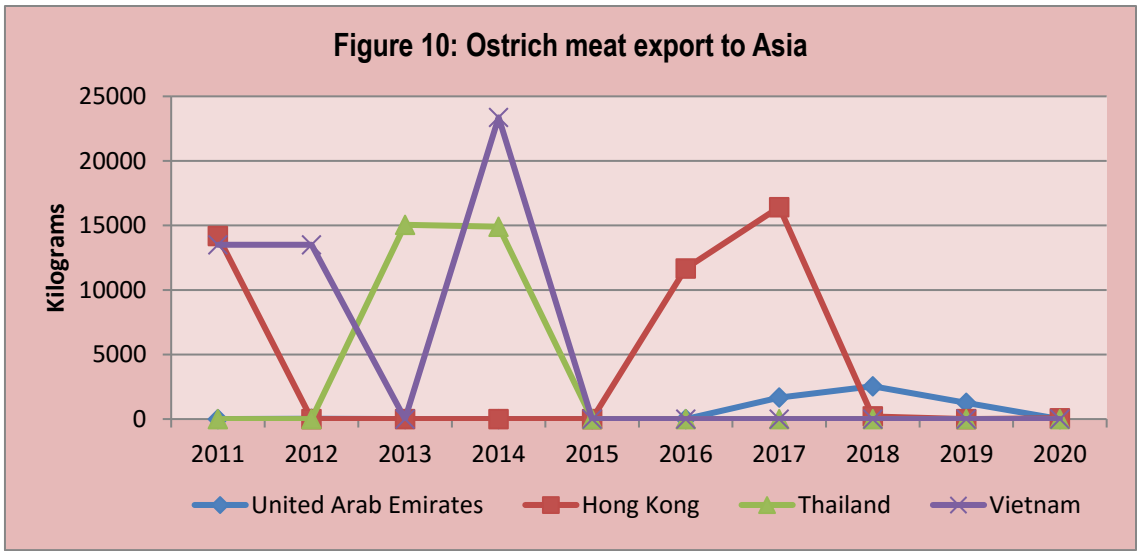
Figures 8 shows that ostrich meat exports quantity and value have been fluctuating in the past decade. From 2011, export quantity and value were experiencing the decline due to the European Union (EU) import ban until 2014/2015. The EU lifted the ban in 2015 based on the prevalence of the Avian Influenza outbreak in South Africa. Following that, the exports emmensly increased in 2016 reaching a new peak. The country faced another outbreak in 2017 which caused the exports to declined by 48% in quantity and 58% in value in 2017. The exports continue to decline in 2018 by 94% and 93% respectively. The ban was lifted in 2019, hence the exports pick up of 325% in quantity and 506% in value respectively. The ostrich meat export increased at a lower rate in 2020 as the world trade of goods were affected by Covid 19 restrictions.

The ostrich export destinations shows that most of exports go to EU. South African ostrich exports to EU, Asia and SADC will be presented in details from Figure 9 to Figure 11 below.



***Source**: Quantec*

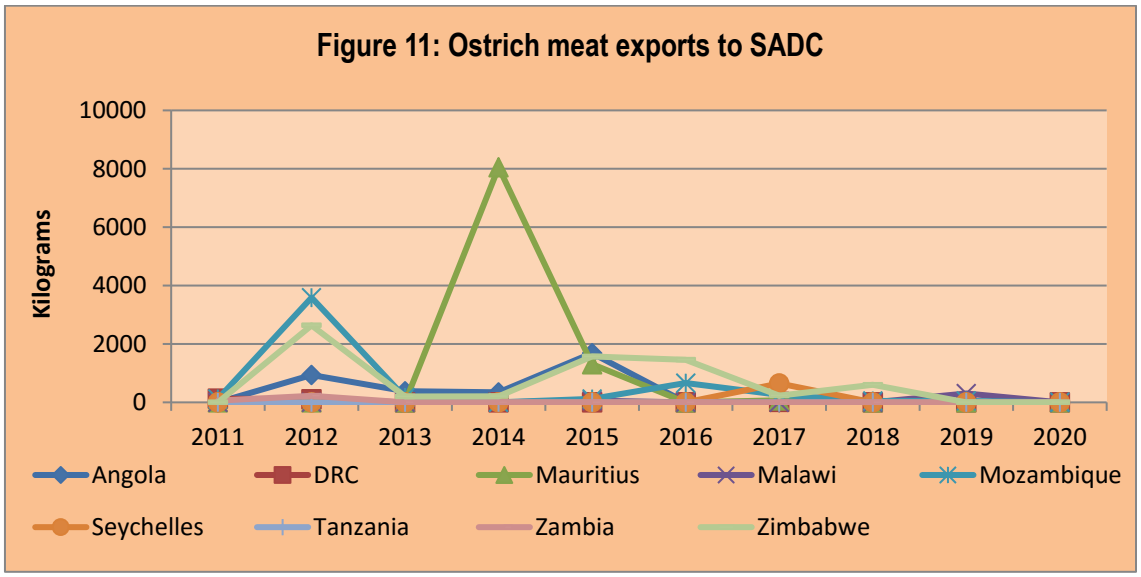
The European Union (EU) is the main import market for South African ostrich meat importing more than 90% of total exports. Exports of ostrich meat to EU experienced drastic decreases in 2012 to 2015 due to the H5N2 avian influenza outbreak in April 2011. There was slight overall improvement of ostrich meat export to EU in 2015 (627 tons) and 2016 (1605 tons). Following another AI outbreak in 2017, the export declined in 2017 and further decline in 2018. In 2019 and 2020, the exports increased through Netherlands with an increase of 296% and 40% respectively. In total, Belgium dominated the market followed by Germany and France.



***Source:** Quantec*

Figure 10 indicate that ostrich exports to Asia were fluctuating over the period under analysis. Hong Kong export trend shows that the AI had negatively affected trade with South Africa. Asia's highest imports from South Africa were experienced during 2014. Viet Nam increased drastically in 2014 and commanded the highest imports. On average, Viet Nam is the highest importer of ostrich meat within Asia, which account for 39% followed by Hong Kong with 33%, then Thailand and United Arab Emirates with 24% and 4% respectively. There were no exports of ostrich meat to Asia from South Africa in 2015.

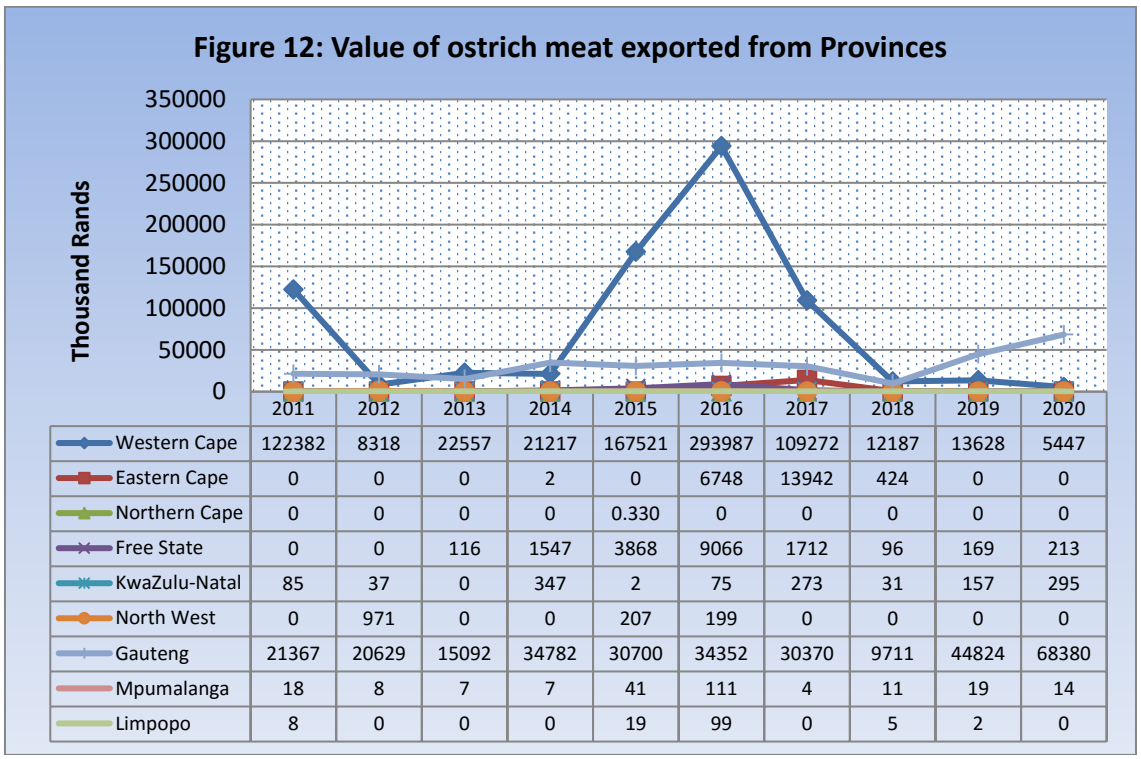
The exports of ostrich meat to SADC are presented in Figure 11 below.



Source: *Quantec*

According to Figure 11, ostrich exports were below 10 000 kilograms for majority of SADC countries. The export volumes reached the highest point through Mauritius importing 8 000 kilograms in 2014. Zimbabwe imported 3 000 kilograms and Mozambique imported 4 000 kilograms in 2012. In total, Mauritius commanded the highest share of 9428 kilograms of South African ostrich meat during the period under review, followed by Zimbabwe (6908 kilograms) and then Mozambique by 5 023 tons.

Values of ostrich meat exports from various provinces of South Africa are presented in Figure 12.



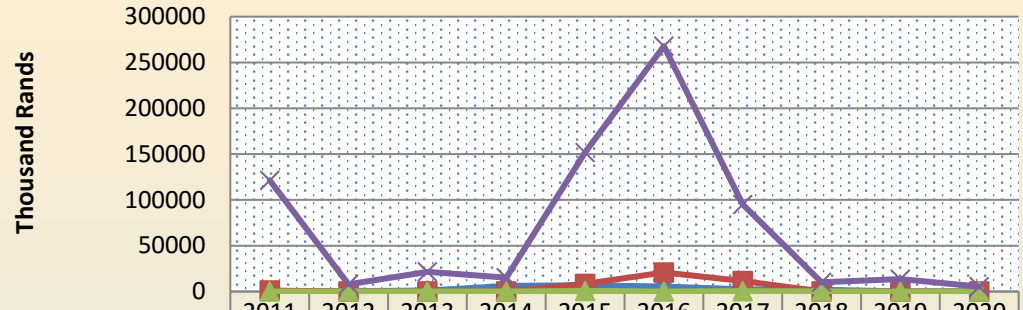
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Western Cape	122382	8318	22557	21217	167521	293987	109272	12187	13628	5447
Eastern Cape	0	0	0	2	0	6748	13942	424	0	0
Northern Cape	0	0	0	0	0.330	0	0	0	0	0
Free State	0	0	116	1547	3868	9066	1712	96	169	213
KwaZulu-Natal	85	37	0	347	2	75	273	31	157	295
North West	0	971	0	0	207	199	0	0	0	0
Gauteng	21367	20629	15092	34782	30700	34352	30370	9711	44824	68380
Mpumalanga	18	8	7	7	41	111	4	11	19	14
Limpopo	8	0	0	0	19	99	0	5	2	0

Source: *Quantec*

It is clearly indicated on Figure 12 above that the highest exports of ostrich meat originate from Western Cape Province. This is due to the fact that approximately 90% of the industry's primary production is in Western Cape Province. The second largest exporter is Gauteng and the third largest exporter was Eastern Cape Province. Intermittent exports were recorded from the other six provinces. The low exports in 2011 to 2014 was due to the exports suspension of ostrich meat from South Africa due to H5N2 avian influenza outbreak. Subsequent to South Africa being declared disease free in 2015, the ostrich exports increased mainly in Western Cape with a total share of above 70% from 2015 to 2018 respectively. In 2019 and 2020, Gauteng raised its exports and led the market with a share of 76% and 92% respectively.

The following figures (Figures 13 - 21) show the value of ostrich meat exports from the various District Municipalities in the nine Provinces of South Africa.

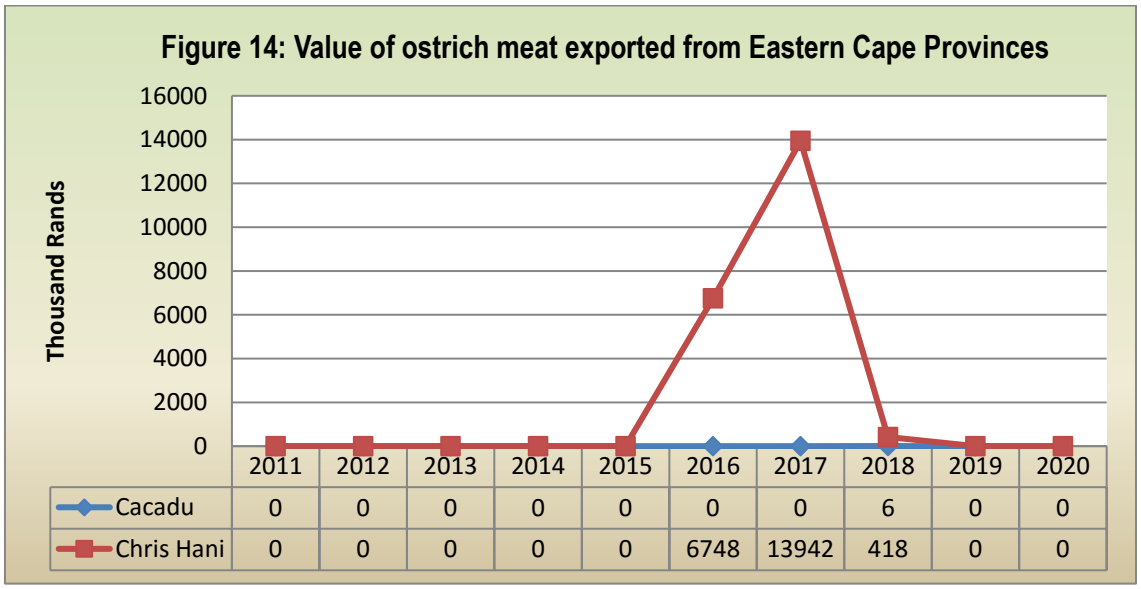
Figure 13: Value of meat exported from Western Cape Province



	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
City of Cape Town	38	458	1090	6081	6914	5459	2477	1933	60	116
West Coast	1020	0	0	0	8270	20731	11466	0	0	0
Cape Winelands	0	0	0.4	0	621	0	411	167	1	2
Eden	121324	7861	21466	15136	151715	267797	94918	10087	13567	5329

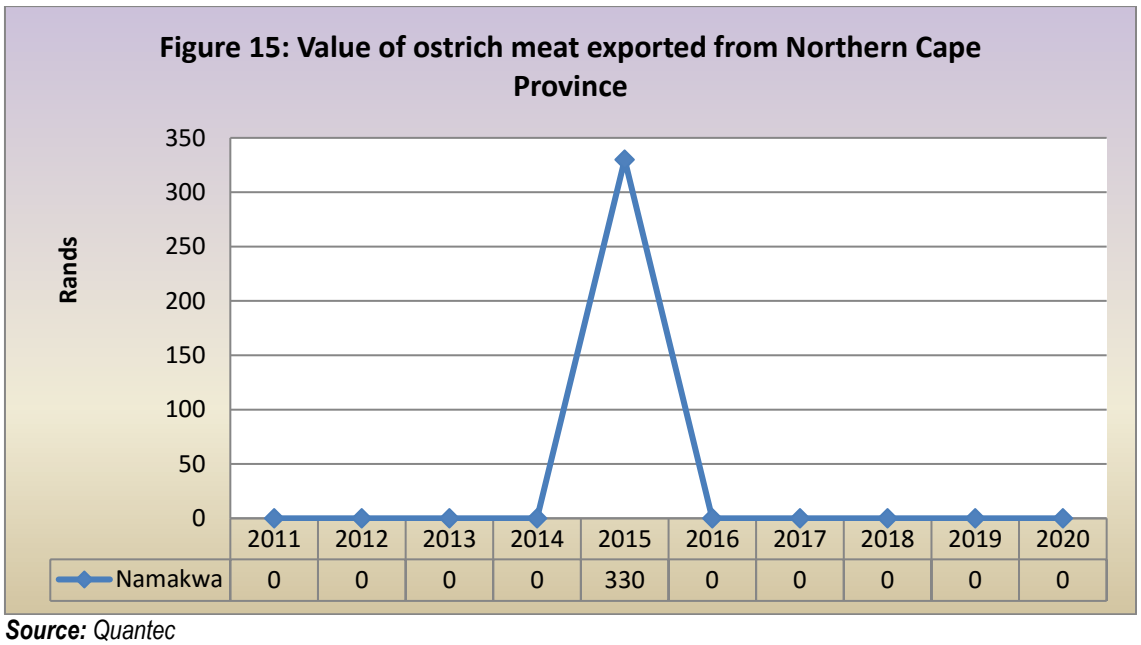
Source: *Quantec*

From the Western Cape Province, Eden District Municipality was the main exporter of ostrich meat with a total of R709 million during the period under review. The Municipality was followed by the West Coast District Municipality and City of Cape Town Metropolitan Municipality with a total of R41 million and R24 million respectively. Cape Winelands District Municipality was the smallest exporter of ostrich meat during the period under review. The figure show that the value of ostrich meat exports from Eden District Municipality attained a peak of R267 million in 2016. The figure also shows that the increase in 2015 and 2016 for this province was mainly from Eden. Eden District Municipality had an export share of above 90% in both 2015 and 2016. The district declined again in 2017 following the export ban due to an AI influenza and remained flat from 2018 to 2020. However, the district had the highest share of above 90% respectively of ostrich products exports.



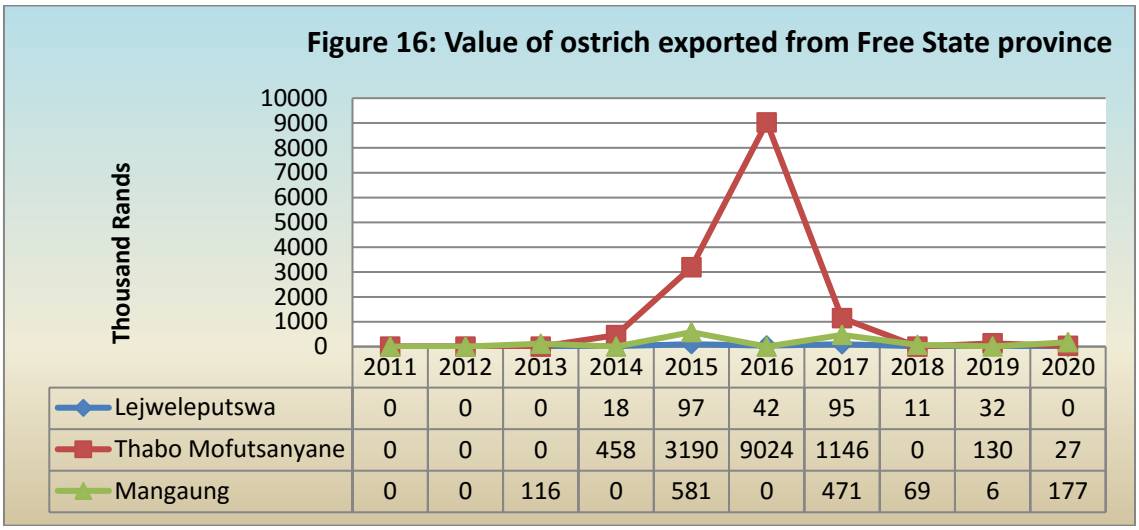
Source: *Quantec*

Figure 14 above shows that exports of ostrich meat from Eastern Cape Province were mainly from Chris Hani and Cacadu district municipalities. Chris Hani recorded the ostrich meat exports value from 2016 to 2018 while Cacadu recorded only in 2018. In total, Christ Hani ostrich meat worth of R21 million and Cacadu District Municipality exported R6 000 during the past 10 years. There were no records of ostrich meat exports in Eastern Cape from 2011 to 2015 and again in 2019 to 2020. Chris Hani reported over 99% share of exports of ostrich meat from 2016 to 2018.



Source: *Quantec*

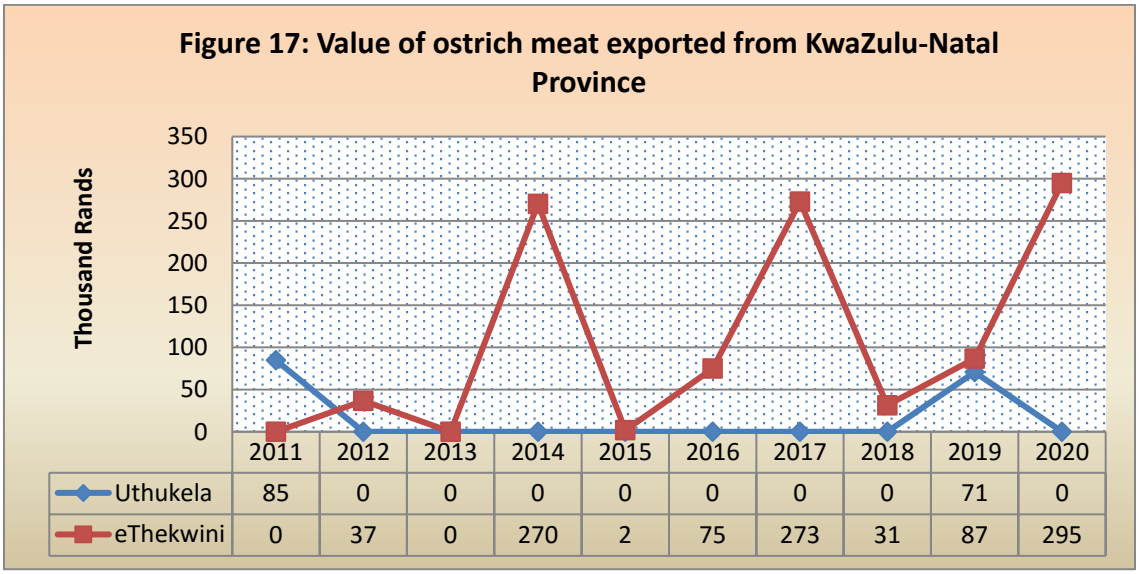
Figure 15 above shows that Namakwa District Municipality was the only municipality exporting ostrich meat in the Northern Cape Province for the past decade. Namakwa District Municipality recorded a value of R330 only in 2015. There were no records of ostrich exports in Northern Cape for the rest of the years.



	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Lejweleputswa	0	0	0	18	97	42	95	11	32	0
Thabo Mofutsanyane	0	0	0	458	3190	9024	1146	0	130	27
Mangaung	0	0	116	0	581	0	471	69	6	177

Source: *Quantec*

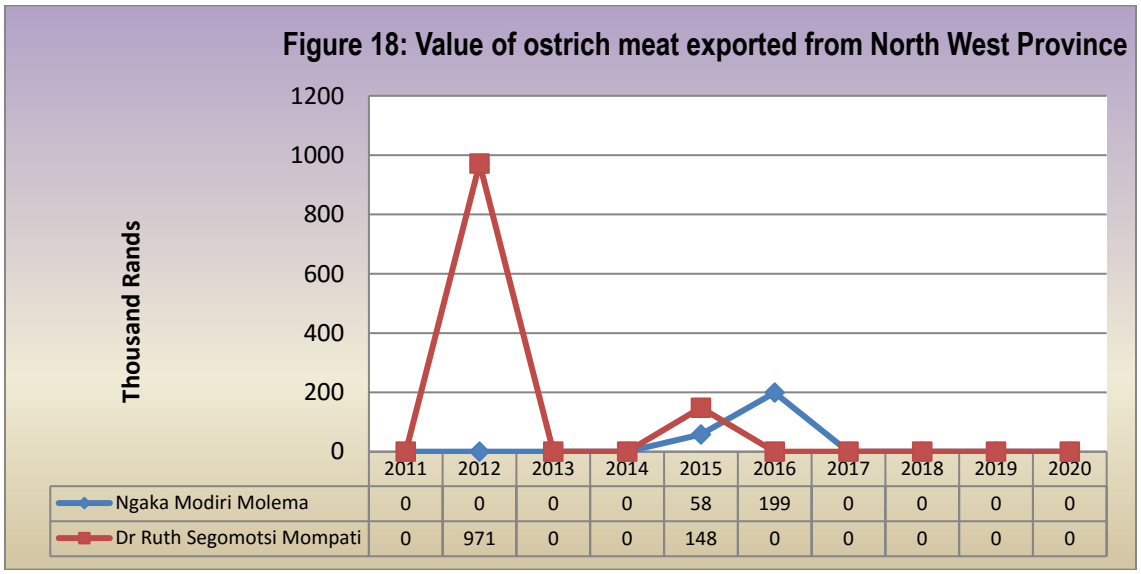
From Free State Province, the exports of ostrich meat were recorded in Mangaung, Lejweleputswa and Thabo Mofutsanyane District Municipalities. The Figure 16 above shows that, the province started to export ostrich meat in 2013 through Mangaung. During the period under review, Thabo Mofutsanyane District Municipality was the highest exporter of ostrich meat worth approximately R14 million in total. It was followed by Mangaung with R1.4 million and lastly Lejweleputswa District Municipality with R294 878. Thabo Mofutsanyane was leading in the exporting years except 2020 were Mangaung took a lead with an export share of 87%.



	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Uthukela	85	0	0	0	0	0	0	0	71	0
eThekwini	0	37	0	270	2	75	273	31	87	295

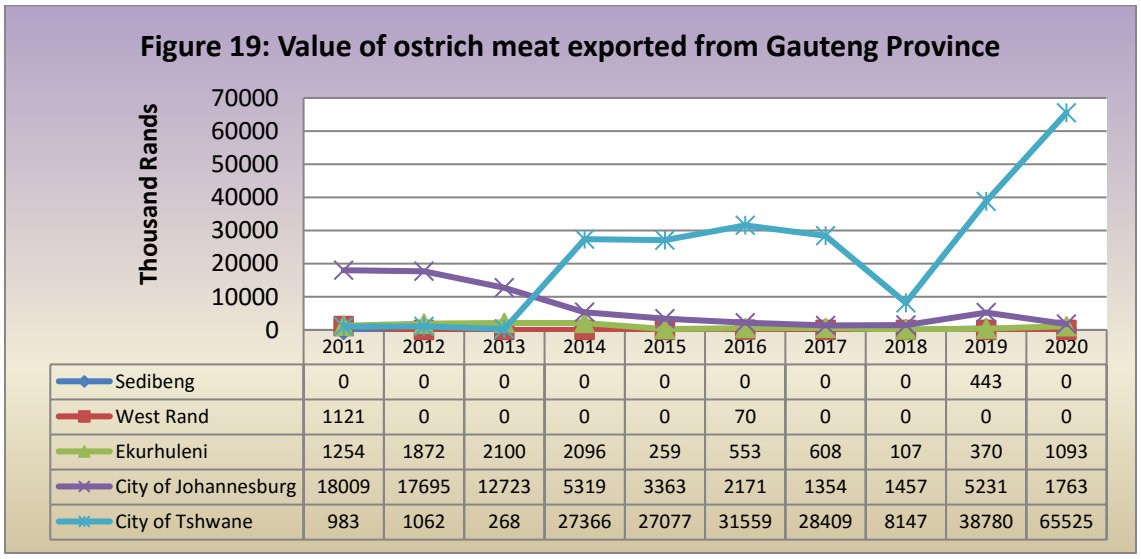
Source: *Quantec*

From KwaZulu-Natal Province, eThekwini Metropolitan Municipality was the main expoter within the province. The municipality exported ostrich meat in the past decade except 2011 and 2013. UThukela District Municipality recorded ostrich meat only in 2011 and 2019. The total exports from the province declined by 88% in 2018. In 2019, both municipalities raised exports with eThekwini leading with market share of 45% and Uthukela 45% respectively. eThekwini Metropolitan Municipality recorded the 100% market share in 2020.



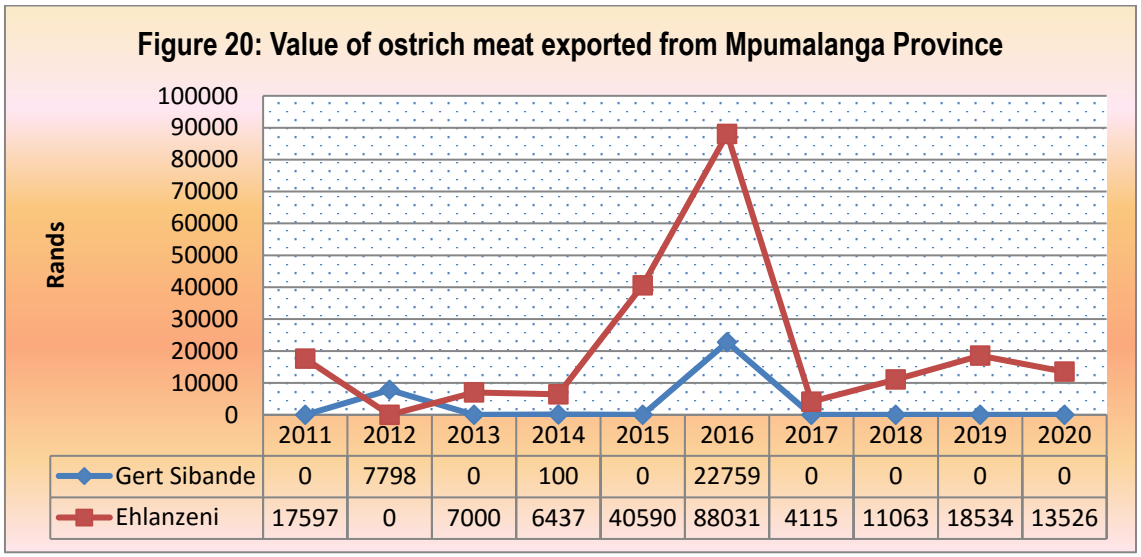
Source: *Quantec*

Generally exports from the North West Province are low due to the fact that North West Province is a summer rain region and the establishment of ostrich farms in this province was triggered by the good price of ostrich meat and the weaker rand during the early 2000's and currently all 30 registered ostrich farms are non-functional. Figure 18 above indicate that from North West Province, Dr Ruth Segomotsi Mompati District Municipality was the leading district that exported ostrich meat during the period under analysis. However, Ngaka Modiri Molema recorded its exports in 2015 and increased by 243% in 2016. There were no exports of the ostrich meat in North West Province in 2011 and 2013-2014 and again in 2017 – 2020. Dr Ruth Segomotsi Mompati District Municipality attained a peak of R971 331 in export value of ostrich meat in 2012.



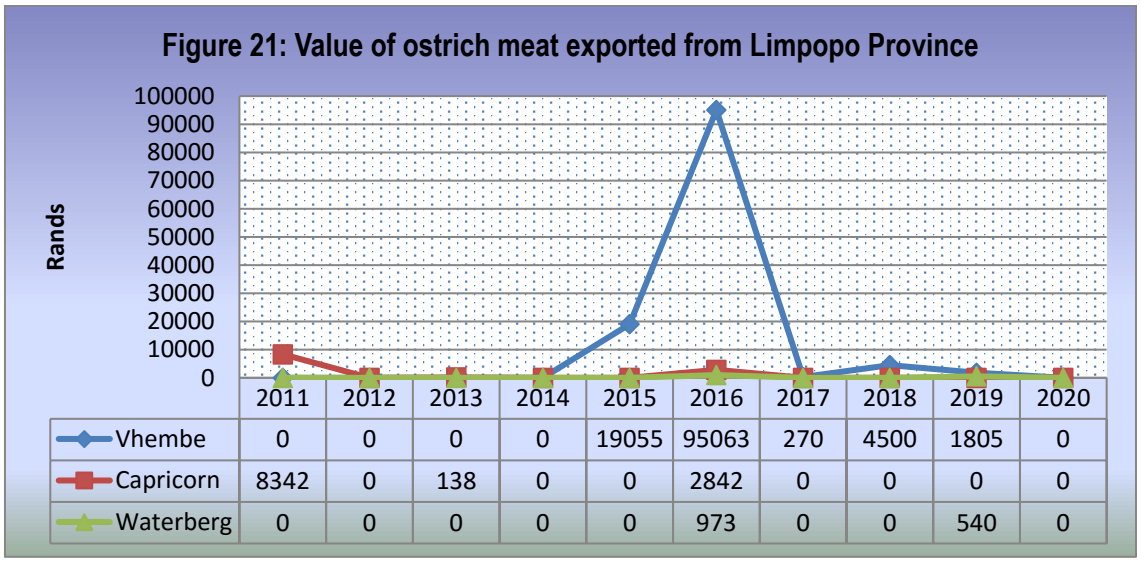
Source: *Quantec*

Figure 19 indicates that the City of Tshwane Metropolitan Municipality was the greatest commander of ostrich meat export in value followed by City of Johannesburg Metropolitan Municipality during the period under review. City of Johannesburg was the leading exporter from 2011 to 2013, and then City of Tshwane took over from 2014 to 2020. City of Tshwane immensely declined in 2018 due to the AI outbreak of 2017. City of Johannesburg Metropolitan Municipality attained maximum of R18 million in 2011 and declined thereafter. Sedibeng, Ekurhuleni and West Rand District Municipalities recorded lowest exports of ostrich meat during the period under analysis.



Source: Quantec EasyData

In Mpumalanga province, the exports were recorded from Gert Sibande and Ehlanzeni District Municipalities although irregular. Gert Sibande District Municipality reported the 100% share of exports in 2012. Ehlanzeni District Municipality has commanded greatest exports of ostrich meat in, 2011 and 2013 to 2020. In 2016, both districts increased exports whereby Ehlanzeni District Municipality attained highest value of ostrich meat export of R88 031 (79%) whilst Gert Sibande attained its highest of R22 759 (21%). From 2017 to 2020, Ehlanzeni 100% shares of ostrich exports.

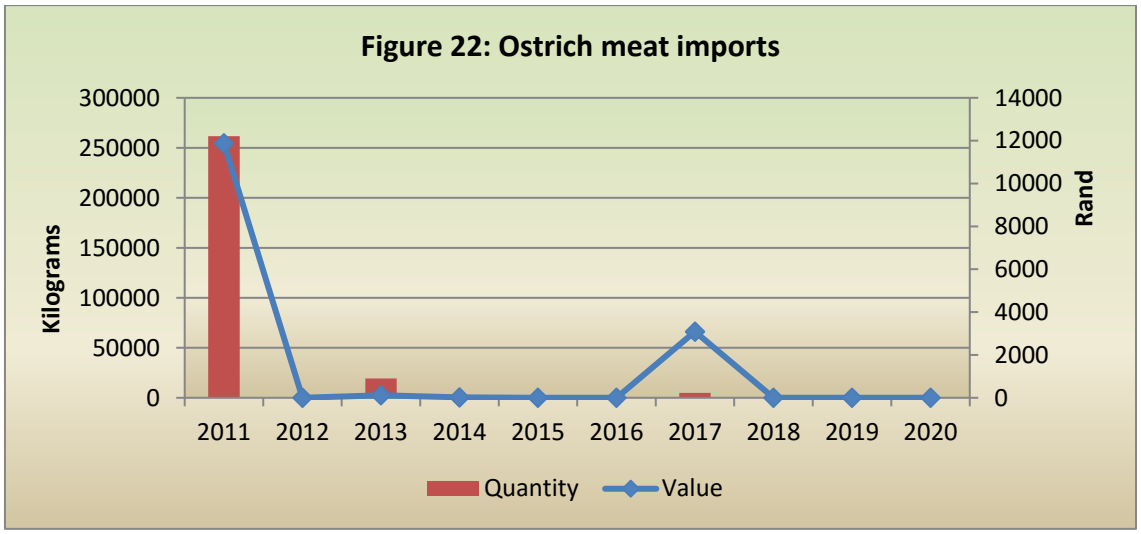


Source: Quantec EasyData

From Limpopo Province, Vhembe, Capricorn and Waterberg District Municipalities have recorded intermittent exports of ostrich meat during the period under analysis. Vhembe District Municipality reported ostrich meat exports from 2015 to 2019 whereas Capricorn District Municipality exported in 2011, 2013 and 2016. There were no exports of ostrich meat in 2012, 2014 and 2020 from Limpopo Province. The highest exports value of R95 063 was attained in 2016 from Vhembe District Municipality, which accounted for 92% export share. Waterberg and Capricorn District Municipalities dropped to zero exports in 2017 and 2018. In 2019, Vhembe and Waterburg had a share of 77% and 23% respectively.

2.2.2. IMPORTS OF OSTRICH MEAT

Figure 22 below shows the quantities and values of South Africa's ostrich imports during the last ten years.



Source: Quantec EasyData

Import quantities and values have been fluctuating throughout the period under review and also following the same trend. During the period under review, the imports of ostrich meat were very low except in 2011. Thus, the ostrich imports was at its peak in 2011 by attaining 12 208 Kilograms with a value of R254 482. There were no imports of ostrich meat in South Africa in 2012, 2015 – 2016 and 2018 - 2020.

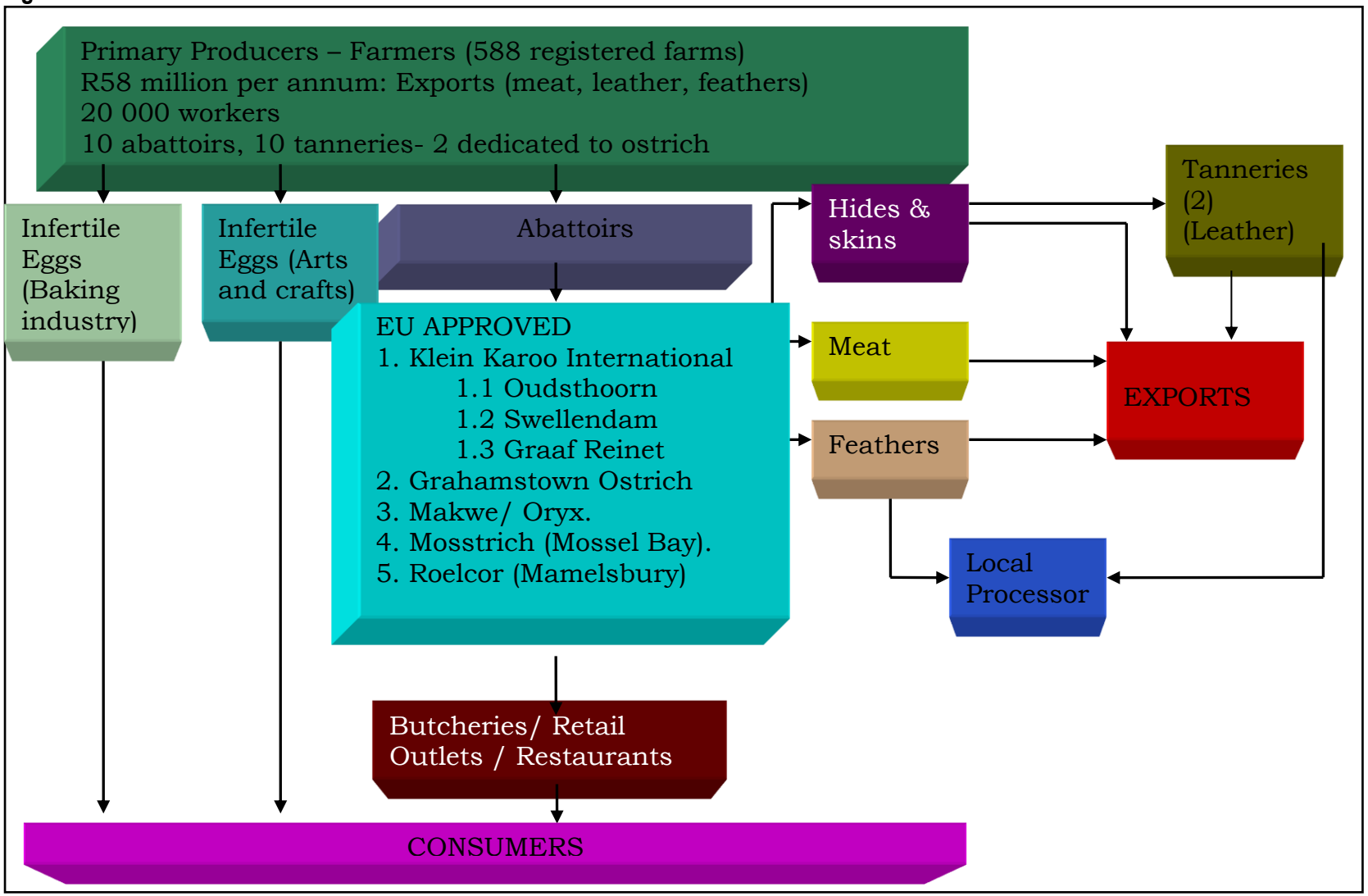
3. OSTRICH PRODUCTS VALUE CHAIN

Ostrich products (leather, meat, feathers and curios) are marketed locally and exported through a free market system. The main market for ostrich meat is restaurants, wholesalers, supermarkets and foodservice suppliers. The market for ostrich leather includes the clothing, fashion and upholstery industries and for feathers the household, fashion and carnival markets.

South Africa has a large number of independent role–players in its ostrich industry. Fierce competition prevails amongst them in order to market their products. Due to the fact that ostrich products are regarded as niche products, the industry as a whole and the different role-players individually has an approach to protect the industry in different ways. This *inter alia* led to an "each for himself"- approach. Unfortunately, it also resulted that there is no coordinated approach to work together or to provide important functions for the benefit of the whole industry, e.g. functions relating to product development, generic marketing, research, etc. On the international market, each processor sells its ostrich products independently of other processors. This led to the undercutting of prices in order to sell larger volumes. It also has a negative effect on monitoring of quality standards, which led to reduction of optimum income levels realized for ostrich products.

Since deregulation, nine new abattoirs were built. Approximately 70% of ostrich products are in the hands of a few players namely Klein Karoo International (Pty) Ltd, Mosstrich, Grahamstown Ostrich Abattoir, Swartland Ostriches, Camdeboo Meat Processors Ltd, Exon, Marowe (Pty) Ltd, Philippe Genuine Ostrich Products and Camexo. The ostrich products value chain is represented in Figure 23.

Figure 23: OSTRICH PRODUCTS VALUE CHAIN



4. ORGANISATIONAL ISSUES

The local ostrich industry is structured as follows: Producers belong to ostrich producer organisations according to provinces. These provincial organisations are members of the South African Ostrich Producers Organisation (SAOPO). The processors (ostrich abattoirs and ostrich leather tanneries) are represented in the National Ostrich Processors Organisation of South Africa (NOPSA). The South African Ostrich Business Chamber (SAOBC), representing both NOPSA and SAOPO, was established in 1998. The SAOBC is regarded as the umbrella body for the South African ostrich industry.

4.1. THREATS AND CONCERNS

- A stronger Rand decreases the profit as 90% of ostrich meat and products are exported.
- Smaller margins and labour legislation as well as the Avian Influenza led to producers leaving the industry.
- An increase in environmental awareness is being experienced on veld utilization.
- Research and development in the industry was previously managed and financed by the Klein Karoo Co-operative but since deregulation, this function has to be funded by the industry in collaboration with the then Department of Agriculture, Forestry and Fisheries.
- While South Africa is the world leader, proper Government Veterinary Services are needed to ensure that South Africa maintains this position.
- For new entrants into the industry new markets need to be explored as the existing markets are saturated.
- There must be an adequate skilled staff to provide regulatory service at all times.

5. CHALLENGES FACING EMERGING FARMERS

Because ostrich farming does not lend itself towards subsistence farming, there are few emerging farmers in the industry. The learning curve for new farmers is steep, as they grapple with the intricacies of general farm management and the industry-specific pitfalls of ostrich farming. Some of the challenges faced by emerging farmers and new entrants are as follows:

- Capital-intensive farming, processing etc.
- High start-up and running costs.
- High Risk Industry - It takes 30 months before money can be obtained from the business. The mortalities can be extremely high during chick raisings and chicks are born without immunity to diseases. Birds are sensitive to temperature changes. The information on diseases is difficult to access.
- Inexperience.
- The absence of guaranteed markets.
- Lack of export expertise.
- Abattoirs and tanneries – Standards are high.
- Feed consumption: 2.5 kg per ostrich per day
- Consumer guarantees on animal welfare and food safety must be given because of the strict requirements of the export market.
- The supply and quality must be consistent.
- The prices are market related and the profit is dictated by the rate of exchange.
- Quality cannot be compromised and must adhere to the same worldwide standards.

6. MEAT QUALITY STANDARDS

The export of ostrich meat is predominantly to Europe, which requires that the industry must comply with the phyto-sanitary requirements of the EU. (Although Switzerland is not part of the EU, they are applying the same phyto-sanitary standards).

The EU requirements are:

- Abattoirs and de-boning and packaging plants must be approved by the EU for the export of ostrich meat to the EU.
- The State as the recognised competent authority must provide meat inspection services at abattoirs approved for export of meat to the EU and must certify the meat prior to export.
- Residue testing of the meat must be done by the competent authority.
- Prior to slaughter, ostriches must be placed in quarantine for at least 14 days. The quarantine camps must be tick free, have no vegetation and must have a 3 metre cleaned area around the camp. Birds must be inspected and treated for tick infection when entering the quarantine camp. A record of the tick control measures must accompany the bird when presented for slaughter. The tick control is required to avoid the possible transmission of Congo fever.
- No growth stimulants or hormonal treatment is allowed.
- Inoculation against Newcastle disease is compulsory. An abattoir is also closed for export to the EU if an outbreak of Newcastle disease occurs within 10 kilometres of the abattoir. A Newcastle inoculation certificate must accompany a bird that is presented for slaughter.
- No sand, hay or other organic material are allowed on vehicles used for transporting birds to the abattoir and the vehicles must be disinfected before leaving the abattoir site.
- The Avian Influenza (AI) status of the farm of origin must be indicated when birds are presented for slaughter. The incidence of AI in South Africa during 2011 has caused the closure of the EU for the import of ostrich meat from South Africa. The EU applies strict control measures in this regard.
- All ostriches must have an identification tag that allows the meat to be traced to the farm of origin. Slaughter ostriches must originate from a registered farm and must have been on a registered farm for at least 3 months prior to slaughter. A farm must be registered for at least 6 months before birds can be presented for slaughter.

7. BLACK ECONOMIC EMPOWERMENT PROJECTS

7.1. Western Cape

7.1.1. Klein Karoo Agri Business Centre (Klein Karoo Region)

- **KLEIN KAROO International Ltd (KKI**) is the sponsor of the Klein Karoo Agri Business Centre (KKABC). The aim of the KKABC is to advise new entrants on their business plans and to assist them with funding applications. 286 new jobs have already been created and the aim is to reach 440 new jobs. Some of the KKABC's successful projects:

  - A manufacturing unit for ostrich leather items sold at the Klein Karoo Ostrich Boutique in Oudtshoorn.

  - At De Hoop (10 km outside Oudtshoorn) a group of previously disadvantaged rural women manufactures ostrich feather and ostrich egg shell products. They ship two containers with products to Germany every six months.

  - The Klein Karoo Feather Sorting Project in Dysselsdorp provides jobs for 100 people and is run independently by its members. KLEIN KAROO International supplies the ostrich feathers, which are sorted and sold back to KKI.

  - Various other projects are being established at the ten agricultural societies in the Klein Karoo region.

  - Study grants are provided to ten students from previously disadvantaged communities. This enables them to enter their first year of degree studies at the Free State University.

7.1.2. SCOT: Southern Cape Ostrich Tanning

- SCOT (Member of the Mosstrich Group, Mossel Bay) has established joint ventures with Transnet and Eskom. SCOT provides ostrich leather product manufacturing training to unemployed women in the Mossel Bay area and sells the products via SCOT's marketing channels. On occasion SCOT also donates leather for worthy developmental projects.

7.1.3. Mosstrich BEE Trust (Mossel bay)

- Mosstrich is owned by 180 ostrich producers. The company has implemented a project whereby 6 000 preferential shares, representing 6.5% of the issued shares capital, were given to 250 employees. The employees share in the company profits and a total of R1 815 million was paid out to the employees in the form of dividends. The next step is to extend this programme to farm labourers working on some of the farms of the ostrich producers.

7.2. Eastern Cape

7.2.1. Integrated Meat Processors of the Eastern Cape (IMPEC)

- Integrated Meat Processors of the Eastern Cape (IMPEC) is fully BEE-compliant and facilitates the economic empowerment of previously disadvantaged individuals through this integrated project where beneficiaries are included in the entire value chain and proper business training is provided to ensure sustainability.

- The Salem Project, which forms part of IMPEC, focuses on community development. It has trained more than 100 small-scale rural black farmers to raise 7 000 ostriches per annum for slaughter in Grahamstown.

7.2.2. Middleton - Ostrich Development Project

- This project creates the opportunity for the upliftment of various previously disadvantaged role players and farm employees.

7.3. Northern Cape

7.3.1. Kuruman

- The Kuruman Project is a Black-owned enterprise comprising 30 members who are involved in ostrich production.

- The SAOBC's ostrich production training booklet is used extensively by the members of this group.

7.4. ALL OSTRICH PRODUCTION AREAS: COUNTRY-WIDE

- Donating ostrich chicks to workers. The producers then assist with raising the chicks and obtaining feed. After the ostriches have reached maturity (slaughter age), the producers buy the birds from their workers.

- Mentorship programmes exist on numerous farms.

- There are also ostrich producers who have founded co-operatives for the benefit of their workers who are now also shareholders.

7.5. OSTRI-BEE QUICK FACTS

- BEE Expenditure: R12 Million per year.
- BEE Active Farms: 600 in Eastern, Western, Northern and Southern Cape.
- BEE Beneficiaries: 15 000 (Direct and indirect)
- The SAOBC commissioned the publication of The Ostrich Farm – How to Get Started. This booklet is given free of charge to new small-scale ostrich farmers.

8. MARKET INTELLIGENCE

8.1. EXPORT TARIFFS OF OSTRICH MEAT

Table 1 show tariffs faced by ostrich meat originating from South Africa during 2019 and 2020.

Table 1: Tariffs faced by South African ostrich meat exports

Country	Product Code (NTL)	Trade regime description	2019		2020	
			Applied Tariffs	Total Ad valorem Equivalent tariff (estimated)	Applied Tariffs	Total Ad valorem Equivalent tariff (estimated)
Germany, Netherlands, France and Switzerland	02089010	Preferential tariff for South Africa	0%	0%	0%	0%
Qatar	02089010	MFN duties applied	5%	5%	5%	5%

Source: Market Access Map

Table 1 indicates that South Africa receives an exports tariff of 0% when exporting ostrich meat to Germany, Netherlands, France and Switzerland. Qatar also charged South Africa MFN duties rate of 5% for the product coded above in 2019 and 2020.

8.2 IMPORT TARIFFS

Table 2: Import tariffs applied by South Africa on ostrich meat

			Rate of Duty				
	Article Description	Statistical unit	General	EU	EFTA	SADC	MERCOSUR
02.08	**Other meat and edible meat offal, fresh, chilled or frozen:**						
0208.90	**Other**						
0208.90.10	Of ostriches	Kg	free	free	free	free	free

Source: SARS

Table 2 clearly indicates that South Africa is does not charge tariff to all its trade agreements (EU, EFTA, SADC and MERCUSOR) on ostrich meat imports. South Africa is also applying free of charge on ostrich imports coming from any other general countries.

9. PERFORMANCE OF SOUTH AFRICAN OSTRICH INDUSTRY IN 2020

9.1. Exports

Table 3: List of importing markets for ostrich meat (fresh, chilled or frozen) exported by South Africa in 2020

Importers	Indicators														
	Value exported in 2020 (USD thousand)	Trade balance 2020 (USD thousand)	Share in South Africa's exports (%)	Quantity exported in 2020	Quantity unit	Unit value (USD/unit)	Growth in exported value between 2016-2020 (%, p.a.)	Growth in exported quantity between 2016-2020 (%, p.a.)	Growth in exported value between 2019-2020 (%, p.a.)	Ranking of partner countries in world imports	Share of partner countries in world imports (%)	Total imports growth in value of partner countries between 2016-2020 (%, p.a.)	Average distance between partner countries and all their supplying markets (km)	Concentration of all supplying countries of partner countries	Average tariff (estimated) faced by South Africa (%)
World	4544	4490	100	392	Tons	11592	-35	-40	12		100	-7			
Netherlands	3651	3651	80.3	267	Tons	13674	1	-7	69	2	12.9	-1	4299	0.15	0
Switzerland	267	267	5.9	16	Tons	16688	-42	-45	-62	5	8.1	-9	3002	0.17	0
Germany	236	236	5.2	19	Tons	12421	-74	-50		1	19.6	-8	6468	0.17	0
Italy	86	86	1.9	6	Tons	14333	-23	-34		9	3.4	-8	2288	0.13	0
France	75	75	1.7	6	Tons	12500	-59	-60	-61	4	8.4	-10	8169	0.19	0
Qatar	56	56	1.2	6	Tons	9333	62	60	-15	47	0.05	-22	4670	0.73	5
Somalia	53	53	1.2	14	Tons	3786			-81	33	0.2	148	2649	0.9	
Hong Kong, China	50	50	1.1	12	Tons	4167	-60	-49		7	3.8	12	3463	0.53	0
Namibia	22	18	0.5	9	Tons	2444	-41	-41	-82	77	0.01	-31	8381	0.41	0
Mozambique	19	19	0.4	17	Tons	1118	-34	-34	-46	83	0	-39	950	0.59	0
Eswatini	11	11	0.2	10	Tons	1100	41	14	22						0
Lesotho	4	4	0.1	6	Tons	667	-75	-38	-4	88	0	-68	369	1	0

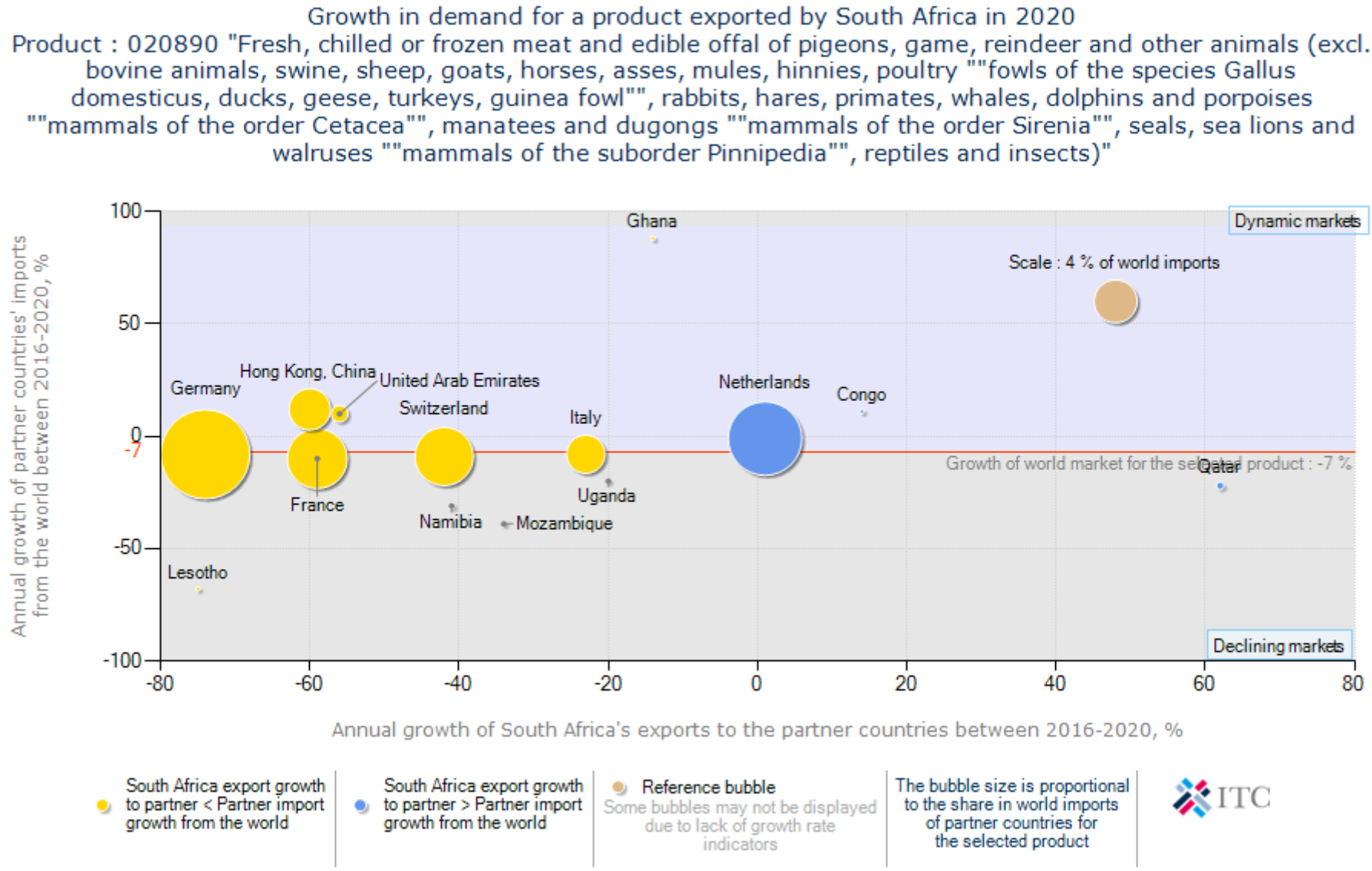
Source: ITC calculations based on COMTRADE statistics.

In 2020, South Africa's export represented **1%** of world export for ostrich meat (fresh, chilled or frozen) and its ranking in world exports was **19**. Table 3 shows that during 2020 South Africa exported a total of 392 tons of ostrich meat at an unit value of US$ 11 592/unit and the total value exported. The major export destinations for ostrich meat originating from South Africa during 2020 were Netherlands, Switzerland and Germany. Netherlands was the leading market for ostrich meat, accounting for 80.3% of South Africa's export market followed by Switzerland with 5.9% and Germany (5.2%) respectively.

On average, during the periods 2016 and 2020, South Africa's exports for ostrich meat decreased by 35% in value and 40% in quantity. During the same period, Netherlands increased by 1% in value and decreased by 7% in quantity per annum.

South Africa's exports for ostrich meat to the world increased in value by 12% during the period 2019 to 2020 and Netherlands increased by 69% in value and Switzerland decreased by 62% during the same period.

Figure 24: Growth in demand for ostrich meat exported by South Africa in 2020

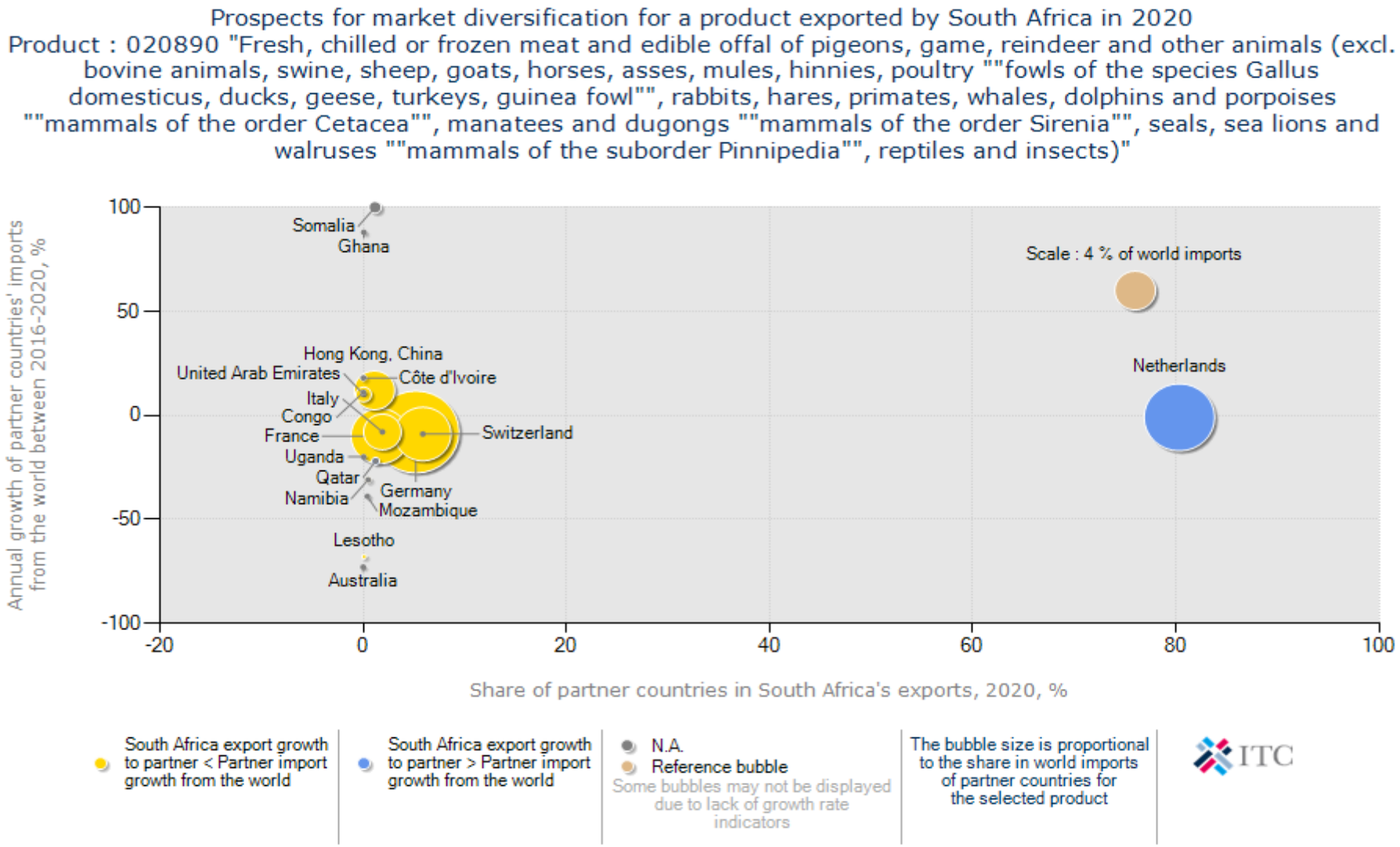


Source: ITC Trademap

Figure 24 shows that between 2016 and 2020 South Africa's ostrich meat exports to Germany, Hong Kong, China,Switzerland, Italy, France and UAE were growing at a rate that is less than their imports from the rest of the world. During the same period, South Africa's ostrich meat exports to Netherlands, Qatar and Congo were growing at a rate that is greater than their imports from the rest of the world.

Further analysis indicates that Lesotho, Namibia and Mozambique represent loss in declining markets. The most growing export market of South African ostrich meat is Ghana and its annual import growth is 88%.

Figure 25: Prospects for market diversification for ostrich meat exported by South Africa in 2020



Sources: ITC Trademap

Figure 25 shows that if South Africa wishes to diversify its ostrich meat exports, the biggest market exist in Germany which has a share of 19.65% of the world's import market. The most attractive markets although small Somalia because its annual growth of imports has increased by 148%. South Africa is currently exporting less than what is importing from the world, therefore penetration into this market may be beneficial.

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Vet. Res. (2008) 39:30
DOI: 10.1051/vetres:2008010

www.vetres.org

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Review article

PrP genetics in ruminant transmissible spongiform encephalopathies

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(Received 5 July 2007; accepted 24 January 2008)

Abstract – Scrapie, bovine spongiform encephalopathy (BSE), and chronic wasting disease (CWD) are prion diseases in ruminants with considerable impact on animal health and welfare. They can also pose a risk to human health and control is therefore an important issue. Prion protein (*PrP*) genetics may be used to control and eventually eradicate animal prion diseases. The *PrP* gene in sheep and other representatives of the order *Artiodactyles* has many polymorphisms of which several are crucial determinants of susceptibility to prion diseases, also known as transmissible spongiform encephalopathies (TSE). This review will present the current understanding of *PrP* genetics in ruminants highlighting similarity and difference between the species in the context of TSE.

scrapie / transmissible spongiform encephalopathy / *PrP* / genetics / ruminant

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1. INTRODUCTION

The *PrP (PRNP, prn-p)* gene encodes the prion protein (PrP), which plays a major role in transmissible spongiform encephalopathies (TSE) or prion diseases. It was already established that variations of the PrP protein sequence were associated with disease onset [66] when *PrP* transgenic mouse models finally proved that scrapie did not develop without PrP protein expression [16]. Further experiments in transgenic mice with different *PrP* gene dosage also suggested an inverse correlation between PrP protein level and incubation period length [17]. The PrP amino acid sequence and *PrP* expression level can therefore

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be seen as one of the key elements in this group of diseases.

PrP polymorphisms in sheep and other representatives of the order *Artiodactyles* are common. Several are crucial determinants of susceptibility to and incubation periods of TSE such as scrapie and chronic wasting disease (CWD). Clinical scrapie cases in sheep and goats have been recorded for many decades in almost all regions of the world [22]. Disease susceptibility and resistance follow genetic rules based on the *PrP* genotype. It is indeed a sign of the close association between *PrP* alleles and sheep scrapie susceptibility that the crucial amino acid variations in ovine *PrP* were discovered very early on, once the gene sequence became available [29]. Repeatedly the same polymorphisms in three codons (136, 154 and 171) appeared associated with different scrapie outbreaks in sheep, due to the relative high frequencies of these polymorphisms in most sheep populations. However, with the discovery of atypical forms of scrapie more recently [9] it has become apparent that the link between PrP genetics and disease susceptibility will have to be re-evaluated.

The degree of amino acid sequence similarity of PrP between species will often have consequences for the transmissibility of TSE between them. It is also often the case that the same or a similar polymorphism in two species will have the same or a similar effect on their TSE susceptibility. Observations regarding the genetic variation of *PrP* in related species are therefore important in the attempt to understand and control susceptibility. The *PrP* gene may be of crucial importance to disease but it is most likely not the only gene exerting influence on it. Several chromosomal regions have been associated with susceptibility [65, 84], but no other gene has yet been unambiguously associated with disease.

This review will present the current understanding of *PrP* genetics and genomics in species of the suborder *Ruminantia* (order *Artiodactyles*) highlighting similarity and difference between the species in the context of prion diseases.

2. *PRP* GENOMICS IN SHEEP, GOATS, CATTLE AND DEER

The *PrP* gene in sheep, goats and cattle has been mapped to chromosome 13 [51]. The genomic sequence available around the *PrP* gene locus is 32 kb in sheep (accession No. U67922), 78 kb in cattle (accession No. AJ298878) and 65 kb in mule deer (accession No. AY330343), oddly there is No equivalent complete sequence from the goat genome yet. Only the genomes of species in the genus *Odocoileus* (e.g. mule deer, white-tailed deer) contain a pseudogene (*PrP*ψ, accession No. AY371694) with all the features of a classical retro-element [15]. The functional length of the *PrP* gene is approximately 21 kb and it is composed of three exons. Exons I and II are small ($\leqslant$ 100 bp) and form the non-coding 5'UTR of the transcript. Exon III ($\sim$ 4 kb) contains the full open reading frame and the 3'UTR of the transcript. Introns I and II are approximately 2.5 kb and 14 kb in length, respectively.

All four genomes described here produce a messenger RNA of about 4.6 kb, but sheep and goat also generate in peripheral tissues by alternative polyadenylation a second mRNA of $\sim$ 2.1 kb [34, 45]. This short mRNA is produced at significant level and may be differently regulated compared to the long mRNA [34]. No 2.1 kb mRNA has been detected in cattle. Whether the deer transcript shows alternative polyadenylation is not known. The specific functions of exons I and II in the 5'UTR are also unknown. Differential splicing of exon II has not yet been observed, however cattle have a particular alternative splicing at exon I which creates either a 5'UTR with an additional 115 bases (exon Ib) [44] or a 5'UTR without exon I [40]. Again, their role is unidentified but one could speculate that the different mRNA are recognised in different regulatory pathways and in that way protein expression could be regulated at various cellular levels.

The gene promoter region regulates production of messenger RNA and consequently controls to a large extent protein expression. The amount of PrP protein, PrP tissue distribution and temporal availability are therefore

all genetically controlled. The *PrP* gene promoter is active in most tissues and *PrP* mRNA can be readily detected throughout development in most ruminants [34]. The ruminant *PrP* promoter contains several well characterised transcription factor motifs within its core (e.g. SP-1, AP-2). Upstream of the core sequence are four motifs highly conserved in sequence and position between species [94] and present in all known *PrP* promoters; they are probably involved in the regulation of transcription.

3. GENETIC VARIATION OF *PRP* GENE

The *PrP* gene open reading frame consensus for *Bovidae* and *Cervidae* has a length of 256 amino acid codons. Processing of the primary translation product leads to a mature PrP protein with 210 amino acids. With the discovery that ovine *PrP* polymorphisms influence the susceptibility to scrapie and BSE and modulate the disease progression, began a remarkable search for polymorphisms and mutations in other ruminants, but also in other phylogenetic groups. The *PrP* gene is now one of the most sequenced genes. More than a hundred species have been analysed and in some species several hundred or even thousands of individual sequences have been recorded in research programmes.

About 40 archetypal *PrP* sequences are available from the families *Cervidae* and *Bovidae* alone. All currently available species *PrP* gene sequences add up to a total of about 155. This number increases to about 300 when all allelic variants based on amino acid polymorphisms are counted. This dataset is an important source of information underpinning the search for mechanisms that link *PrP* with TSE susceptibility and resistance. Importantly, this dataset will in future also be of benefit to assess normal PrP function.

Two types of polymorphisms are found in ruminant PrP protein. The first are single nucleotide polymorphisms (SNP) in the DNA which often cause single amino acid changes. They represent the vast majority of all variants. The second are precise insertions or deletions of PrP-characteristic octapeptide repeats of the type PHGGGWGQ in the N-terminal domain.

3.1. Single amino acid polymorphisms

– *Caprinae* (sheep and goats)

At time of writing, 43 ovine alleles (*Ovis aries*) and 22 caprine alleles (*Capra hircus*) have been described for domesticated breeds in peer-reviewed publications. It has to be assumed that this number will very soon be out-of-date as new polymorphisms and allelic combinations are still discovered on a regular basis and additional polymorphisms have been deposited in gene databases (see also [49]). So far 39 out of 256 codons (15%) are polymorphic. Including the archetypal allele (here and in the literature referred to as ARQ based on amino acids in codons 136, 154 and 171), which is shared by both species, there are a total of 64 alleles (Tab. I). However some of the polymorphisms reside within the N-terminal and C-terminal signal-peptides, which are cleaved off during protein maturation. It follows that the PrP protein of 210 amino acids exists in at least 55 unique variants. All are found in domesticated animals for which the number of analysed sequences is very high. Is there a similar variability in wild sheep and goats? Available data are too limited and not peer-reviewed to answer this conclusively. *PrP* analysis of *Ovis canadensis* (Bighorn sheep) (accession No. DQ648468 to DQ648477) suggests significant genetic variation in some free-ranging populations.

For ovine *PrP* genetics it is now accepted standard to describe the alleles in reference to the three codons (136, 154 and 171) that are of particular importance for scrapie and BSE. The polymorphisms are A136V/T, R154H/L and Q171R/H/K. Ovine *PrP* alleles are therefore abbreviated as eg. $A_{136}R_{154}Q_{171}$ (ARQ), $V_{136}R_{154}Q_{171}$ (VRQ), etc. Other variants with additional polymorphisms are abbreviated as eg. $AF_{141}RQ$. Although sometimes also used for other species eg. goats and cattle to denote the archetypal allele, it is less informative regarding TSE in cattle because these three codons are not polymorphic in cattle.

A review of published polymorphisms for a total of about 15 500 ovine ARQ alleles from many breeds and many flocks in Europe, USA, China, and Japan is presented in Table II. This large number allows a good estimate

Table I. Alleles in sheep and goats.

Allele	Wt-aa*	Species	Reference	Allele	Wt-aa*	Species	Reference
ARQ archetype	–	Sheep, goat	[29, 32]	A-S146-RQ-P240	N - S	Goat	[74]
A21-ARQ-P240	V - S	Goat	[11]	A-D146-RQ	N	Goat	[74]
P23-ARQ	L	Goat	[11]	A-G151-RQ	R	Sheep	[1]
V37-ARQ	G	Goat	[3, 92]	A-C151-RQ	R	Sheep	[86, 88]
S49-ARQ	G	Goat	[11]	A-H151-RQ	R	Goat	[1]
R85-ARQ	G	Sheep	[61]	A-F152-RQ	Y	Sheep	[95]
R101-ARQ	Q	Sheep	[1]	AHQ		Sheep, goat	[11, 31]
3rep-G102-ARQ	5rep- W	Goat	[33]	ALQ		Sheep	[4]
P110-ARQ	N	Goat	[3, 92]	AHR		Sheep	[60]
T112-ARQ	M	Sheep	[62]	AR-S167-Q	R	Sheep	[21]
I 112-ARQ	M	Sheep	[95]	AR-L168-Q	P	Sheep	[37]
P116-ARQ	A	Sheep	[80]	AR-Q168-Q-P240	P - S	Goat	[74]
A127-ARQ	G	Sheep	[42]	AR-D172-Q	Y	Sheep	[1]
V127-ARQ	G	Sheep	[38]	ARH		Sheep	[8]
S127-ARQ	G	Sheep	[38, 95]	ARR		Sheep	[29]
S127-ARQ-P240	G - S	Goat	[35]	6rep-ARR	5rep	Sheep	[78]
S127-ARH-176D	G - N	Sheep	[63]	ARK		Sheep	[21]
Q133-ARQ-P240	L	Goat	[3]	ARQ-E175	Q	Sheep	[1]
VRQ		Sheep	[31]	ARQ-K176	N	Sheep	[91]
VRR		Sheep	[60]	ARQ-Y180	H	Sheep	[2, 42]
VHQ		Sheep	[21]	ARQ-R189	Q	Sheep	[38]
TRQ		Sheep	[12]	ARQ-L189	Q	Sheep	[38, 95]
A-T137-RQ	M	Sheep	[13]	ARQ-S195	T	Sheep	[21]
A-I137-RQ-P240	M - S	Goat	[3]	ARQ-S196	T	Sheep	[21]
A-R138-RQ	S	Sheep	[21]	ARQ-Q211	R	Sheep	[8]
A-N138-RQ	S	Sheep	[86, 88]	ARQ-Q211	R	Goat	[35]
A-F141-RQ	L	Sheep	[13]	ARQ-L218	I	Goat	[95]
A-M142-RQ-P240	I - S	Goat	[32]	ARQ-H220-P240	Q –S	Goat	[11]
A-K142-RQ	I	Sheep	[93]	ARQ-K222	Q	Goat	[35, 95]
A-R143-RQ	H	Sheep	[21, 42]	ARQ-P240	S	Goat	[32]
A-R143-RQ-P240	H - S	Goat	[11]	ARQ-S241	P	Sheep	[42]
A-S146-RQ	N	Sheep	[95]				

Only peer-reviewed journal data. * WT-aa: amino acid of archetype (wildtype).

of the genetic variability of *PrP*. A surprisingly high percentage of 24% (~ 3 800 ARQ alleles) was reported to have an additional polymorphism (Tab. II). Most of these alleles have low frequencies. Some would currently be classified as rare, but this could obviously change when more flocks are analysed. Allele frequency differences can clearly be seen from the published data between breeds and countries, which may become important when breeding strategies have to be tailored to individual needs.

A similar review of published data for goats revealed that from a total of about 1 900 caprine ARQ alleles, 29.6% (556 alleles) were polymorphic at another codon (Tab. III). Again, these observations cover many breeds and populations from Europe, China and Japan. A high level of *PrP* variation is therefore not unique to sheep.

– *Bovinae* (cattle), *Cervinae* and *Capriolinae* (deer)

In cattle (species *Bos taurus*, *Bos indicus, Bos javanicus* and *Bos gruniens*) there are only eight *PrP* alleles based on single amino acid changes described to date. That results in eight unique mature PrP variants. In bison and buffalo the number is 14 alleles, with 11 unique mature PrP variants. Altogether there are 22 alleles expressing 19

Table II. Number of published observations for additional polymorphisms in the ovine ARQ allele.

Polymorphism	*n* observations	Reference	Polymorphism	*n* observations	Reference
R85	1	[61]	C151	35	[36]
R101	23	[36, 61]	H151	4	[36]
T112	692	[36, 38, 61, 93]	F152	7	[95]
I 112	65	[95]	S167	16	[36]
P116	5	[36]	L168	50	[36]
A127	2	[36]	D172	3	[36]
V127	27	[38, 61, 93]	E175	46	[36]
S127	172	[38, 61, 95]	K176	17	[36, 93]
T137	177	[36, 78, 93]	Y180	21	[2, 36]
R138	15	[36]	R189	3	[38]
N138	43	[36]	L189	89	[38, 61, 95]
F141	1 604	[2, 36, 61, 78, 93]	S195	4	[36]
K142	1	[93]	S196	2	[36]
R143	103	[2, 36]	Q211	1	[8]
S146	2	[61, 95]	S241	565	[36, 78, 95]
G151	5	[36]			

ARQ wildtype, n = 12 088 [2, 36–38, 61, 78, 93, 95].

Table III. Number of published observations for polymorphisms in caprine PrP.

Polymorphism	*n* observations	Reference	Polymorphism	*n* observations	Reference
A21	6	[11]	R143	142	[3, 11, 32, 59, 92, 95]
P23	1	[11]	S146	26	[74]
V37	43	[3, 92]	D146	21	[74]
S49	2	[11]	H151	9	[74]
G102	6	[33, 59]	H154	100	[3, 11, 74, 92, 95]
P110	9	[3, 92]	Q168	11	[74]
S127	20	[3, 35, 59, 95]	Q211	35	[35, 59]
Q133	2	[3]	L218	19	[95]
I 137	10	[3]	H220	4	[11, 74]
M142	44	[3, 30, 35, 59]	K222	47	[3, 35, 92, 95]

Wildtype (equivalent to sheep ARQ), n = 1323 [3, 11, 32, 33, 35, 59, 74, 92, 95].
The polymorphism in codon 240 (Ser - Pro) has not been considered because of ascertainment bias.

unique mature proteins published for *Bovinae*. Some of the polymorphisms that have been described (position relative to five-repeat allele): W84R, G100S, K113R, V115M, H143R, S146N, and N177S [42, 95] may have relevance for TSE susceptibility, but this is as yet based on comparison with sheep, goats, and deer rather than TSE exposure studies. From a total of about 1 250 published cattle *PrP* alleles, 16% (~ 200 alleles) were variants [42, 43, 52, 76, 81, 85, 95]. Although this number is quite similar to sheep and goats, it is important to note that the modern breeding regimes applied to *Bos taurus* have resulted in a very much reduced genetic variability in European and American farmed cattle, apparently in contrast to the Asian *Bos* species.

In deer of the subfamily *Cervinae* (species *Cervus elaphus, Cervus canadensis, Cervus nippon*, and *Cervus dama*) data are available for seven unique PrP variants. Potentially important polymorphisms[1] are G59S, T98A, S100G, M132L, M208A, and E226Q [42, 57, 65]. Publications for deer of the subfamily *Capriolinae* (species *Odocoileus* spp.,

[1] Peletto S., Colussi S., Acutis P.L., unpublished observations.

Rangifer tarandus and *Alces* spp.) have revealed so far ten unique PrP variants.

Polymorphisms of interest are G65E, Q95H, G96S, A116G, G129S, S138N, V169M, N176D, M209I, S225F, and Q226K [42, 50, 54, 66]. Taking both deer subfamilies together the number of unique PrP proteins is 17. From almost 1 800 alleles that have been published for mule deer and white-tailed deer at least 25% had an additional mutation. Of the 562 wapiti *PrP* sequences 18% carried the only known polymorphism in this species (132L) [42, 53, 55, 66].

3.2. Octapeptide polymorphisms

The previous chapter has described the large variety of PrP sequences generated by single amino acid changes. There is a different type of variation unique to the PrP protein. The N-terminus of PrP contains normally three copies of the octapeptide PHGGGWGQ enclosed by two nonapeptides P(Q/H)GGGGWGQ. Within this arrangement the number of octapeptides is polymorphic. The glycine-rich peptides are also often simply referred to as repeats. All *genera* discussed here have alleles with three octapeptides (five repeats in total), cattle have alleles with two to five octapeptides (four to seven repeats in total) [30, 79]. Sheep have one additional allele with four octapeptides (six repeats in total) [78], and goats have one additional allele with only one octapeptide (three repeats in total) [33]. It has been shown that a total number of repeats above eight is associated with increased risk to Creutzfeldt-Jakob disease, a human form of TSE [28, 66]. In contrast the relevance of a repeat variation between three and seven, found in ruminants, to TSE susceptibility has not yet been fully resolved.

3.3. Species differences in *PrP* sequence

Scrapie and BSE have been found in domesticated animals or animals living in captivity from the subfamilies *Bovinae* (*Bos taurus* (cattle), *Tragelaphus strepsiceros* (Greater Kudu) and *Tragelaphus angasii* (Nyala)), *Caprinae* (*Capra hircus* (goat)) and *Hippotraginae* (*Oryx leucoryx* (arabian Oryx)) [58]. CWD is well established in captive and free-ranging deer of the subfamilies *Cervinae (Cervus canadensis)* and *Capriolinae (Odocoileus heminonus*, *Odocoileus virginianus*, *Alces alces*) and its spread in the wild is proof that TSE can become established at natural population density [67].

Species within *Ruminantia* carry a minimum of 105 alleles, which encode 85 distinctive mature PrP protein variants. This variability may represent an important barrier in the cross-species transmission of TSE. The number of possible genotypes in all these species is considerable, potentially several hundred. On the other hand it has to be noted that the allele frequencies vary significantly, some of the variants have so far only been found in one or two animals. Of course that does not exclude the possibility that they are or will become numerous in specific breeds or populations. Remarkably, none of these polymorphisms has been found exclusively in TSE affected animals, adding further circumstantial evidence that ruminant TSE are not genetic diseases in contrast to some human TSE such as Gerstmann-Sträussler-Scheinker syndrome [66].

Eight positions (codons 98, 100, 146, 158, 177, 189, 208, 226) show no consensus between the various ruminant species which are reviewed here. Some of these differences can be regarded as common types of replacements, eg. Ser_{100}/Gly_{100}, which may be expected to have a relative minor effect on protein structure, although they could still impact on PrP interactions and function. Others are of more interest as they are within the neighbourhood of polymorphisms that have been associated with TSE susceptibility. Codon 158 (Tyr or His) is close to 154 which modulates scrapie in sheep and goats. Codon 177 (Asn or Thr) is in the neighbourhood of codon 171 which again is associated with scrapie. Codon 226 (Gln or Glu) is adjacent to codon 225, which has been associated with CWD susceptibility [53] and close to codon 222, which is proposed to enhance resistance to scrapie in goats [3, 92]. It remains to be seen whether these differences can give some protection for the transmission of TSE between species.

3.4. *PrP* promoter polymorphisms

Recent studies of the control regions of bovine *PrP* gene have revealed 46 polymorphisms within a 5.4 kb fragment ranging from promoter I to exon II, based on the analysis of about 140 chromosomes [43, 76]. Two prominent insertion/deletion (indel) polymorphisms were detected in the *PrP* promoter and intron I: a 23 bp indel (position 47836) and a 12 bp indel (position 49729, reference sequence AJ298878). Both sequences are transcription factor binding motifs [77].

Analysis of the ovine *PRNP* promoter for polymorphisms revealed three polymorphisms (C/A-5354, T/C-5382 and C/G-5622, reference sequence U67922) [70, 71]. The variants A-5354 and G-5622 created consensus sequences for STAT and SP1 transcription factors, respectively, and C-5382 was within conserved motif 1. We have evidence from protein-DNA binding studies that the polymorphisms in 5382 and 5622 significantly change the binding characteristics of transcription factors, but there is as yet no confirmation that this regulates *PrP* mRNA expression or that these polymorphisms are associated with sheep scrapie (Goldmann, personal observation).

4. ASSOCIATION OF *PRP* GENETICS WITH TSE

4.1. Classical scrapie in sheep

The *PrP* genetics of classical scrapie in sheep are the best investigated. Although the underlying mechanisms are poorly understood, there are specific rules that relate the *PrP* genotype to scrapie susceptibility and incubation period. In the majority of scrapie outbreaks and the majority of breeds the standard model of the three-codon *PrP* genotype applies. The association of these three codons, 136, 154, and 171 with scrapie was first established in ovine experimental scrapie models [6] but it was soon shown that they could be effectively transferred to natural disease. Based on the variation found in the UK sheep population originally 15 three-codon genotypes were defined [19]. In this standard model, codon 136 has two possible amino acids, A and V, codon 154 has also two, R and H. Codon 171 has three possible amino acids, Q, R and H. These polymorphisms are combined to form five alleles (ARQ, VRQ, AHQ, ARR, ARH) and those can be arranged in 15 genotypes, eg. ARR/ARR, VRQ/ARQ, or ARH/AHQ. Even after more than fifteen years of *PrP* genotype analysis these are still the only alleles (based on the three codons) with significant frequencies in the world. Novel combinations such as VRR and AHR were described for breeds in Germany and USA [21, 61], but they appear to be very rare indeed, the same is true for new mutations such as TRQ, ARK, and ALQ [1, 4, 12, 21]. A five-group risk classification system has been developed based on these fifteen genotypes which was modified to be applied in breeding and eradication programmes like the National Scrapie Plan (NSP) of Great Britain[2] and equivalent plans in other member states of the EU [19, 22].

The highest risk group (R5) is reserved for animals that are at greatest risk to develop scrapie [6, 7]. In the UK and in many outbreaks outside of the UK, such as in France, Ireland and Norway [25, 69, 88] the top group are VRQ/VRQ animals. The risk in this group is so high that scrapie was for a long time regarded as a genetic disease. It has however been shown conclusively that VRQ/VRQ sheep can survive into old age when their environment is free of scrapie infection [26, 48]. The other three genotypes in R5 are VRQ/ARQ, VRQ/ARH and VRQ/AHQ. Whereas the risk estimates are similar to the VRQ/VRQ homozygote in the first two genotypes, the risk for the VRQ/AHQ is surprisingly low [7]. It suggests that the AHQ allele has a clear resistance effect compared to the ARQ allele when it is combined with VRQ. R4 animals are classified as being at lower risk to be affected with scrapie than R5 but the risk to their progeny is still significant, especially as R5 offspring can be produced from their breeding. The VRQ/ARR genotype represents this group. Risk estimates

[2] Department for Environment Food and Rural Affairs, 2008, http://www.defra.gov.uk/nsp [consulted 24 January 2008].

indicate a very significant susceptibility reduction through the presence of the ARR allele.

R3 animals have average resistance to scrapie and the same is true for their offspring, which will always belong to the R3 group. The six genotypes in this group include the ARQ/ARQ as well as the less common ARH/ARH genotype. It is of particular interest to find that an ARQ/ARQ homozygote in the UK has only average susceptibility whereas outbreaks in other countries have convincingly shown that ARQ/ARQ sheep can have similar risk to VRQ carriers. Scrapie-affected ARQ/ARQ sheep can be found in populations where VRQ carriers and ARQ/ARQ animals are similarly exposed to the agent or in populations where only ARQ/ARQ are exposed because of the absence of the VRQ allele altogether (mostly due to breed). For example, in the French "Langlade" flock, ARQ/ARQ animals were affected in parallel to VRQ carriers [25]. In a selection of Spanish flocks of the Rasa breed 95% of scrapie affected animals were ARQ/ARQ, but the VRQ/ARQ flock-mates were not affected [1]. In an Irish study the combined risk for ARQ/ARQ and ARQ/ARH animals was similar to the risk of VRQ/ARQ animals [69]. Equally, scrapie in Germany, Spain and Greece appears to involve ARQ/ARQ animals in a high percentage of cases [1, 12, 64]. Like in scrapie attacking the R5 and R4 groups, in the R3 group a risk reduction (partial resistance) of about three -times can be found in ARQ/AHQ animals [12]. R2 animals (genotypes ARR/ARQ, ARR/AHQ and ARR/ARH) are quite resistant to scrapie but their offspring can be of a higher risk classification (R3). Occasionally R2 animals are found with scrapie [7] which up to recently distinguished them from R1 animals (ARR/ARR) which were regarded as fully resistant to natural scrapie, although not to experimental exposure to BSE [46]. It has now been shown for two ARR/ARR animals from two different populations that they can carry classical scrapie, though both were subclinical cases [39].

Although there has not been a reason to fundamentally change the risk classification system for classical scrapie as developed by Dawson et al. [19], it is now clear that breeds from different countries carry different *PrP* variants and that there is as yet no proper adjustment of the risk group assignment to novel *PrP* genotypes. The additional alleles in codons 136, 154 and 171, TRQ, ALQ, ARK, VRR, AHR [4, 21, 60] alone could lead to 55 additional genotype combinations. Although some of the alleles are low in frequency and as consequence the frequency of certain genotype combinations will be very low, it should not be forgotten that at the level of individual flocks their frequency could become high through simple founder effects, such as the introduction of a specific ram.

With the genetic association to classical scrapie as described above it becomes very relevant to know the allele frequencies of the major variants in different populations and huge effort has gone into genotyping as many breeds (common and rare) as possible around the world. A survey conducted for this review of more than 20 studies [1, 2, 4, 14, 20, 21, 23, 24, 27, 38, 54, 64, 68, 69, 82, 83, 86–88, 90] reporting on sheep populations from 15 different countries in Europe, America and Asia revealed that so far all but one (Iceland) presented significant frequencies of all five major alleles (ARQ; ARR; AHQ; VRQ; ARH) in their sheep. Iceland appears not to have any ARR animals [86]. The allele frequency averaged over all animals in these studies were 56% ARQ, 30% ARR, 6% AHQ, 5% VRQ and 3% ARH. The ARK and ARH allele had average frequencies of 0.4% and 0.02%, respectively. Regional differences are apparent, such as a high frequency (~ 9%) of the ARH allele combined with a low frequency (~ 1.5%) of the AHQ allele in Asian breeds. There is a lower than average frequency (~ 22%) of ARR in the Mediterranean countries and higher than average frequency (~ 11%) of VRQ in Norway. The variation is however huge and individual flocks or breeds – especially rare breeds – may deviate significantly from these averages. Of course these figures are due to change over the next decades when genotyping and breeding programmes are taking effect.

Table II shows that almost 25% of all ARQ alleles have additional polymorphisms and TSE genetics research is only at the beginning to verify their disease association, risk classification and utilisation in breeding programmes. Indeed, the question whether there are alleles other than ARR and AHQ associated with resistance to classical scrapie have been addressed frequently. In Icelandic scrapie outbreaks carriers of the $AC_{151}RQ$ allele were absent from affected animals [86]. Experimental challenges with BSE of $ARP_{168}Q/ARL_{168}Q$ sheep resulted in survivors [37]. Survivors were also found after challenges with BSE/scrapie of genotypes carrying the alleles $AT_{137}RQ$, $AK_{142}RQ$ or $ARQK_{176}$[94]. Often however these studies suffer from low statistical significance because of low allele frequency, or it is unclear how the experimental results on susceptibility translate into risk assessments to the natural exposure. Nevertheless these investigations will have to continue in sheep and transgenic mouse models to enhance our ability to enforce the most appropriate eradication and breeding programmes.

4.2. Atypical scrapie in sheep

The details of *PrP* genetics in atypical scrapie are presented in the special issue ("Prion diseases in animals") by Benestad et al. [10]. However, it is important to highlight here some of the genetic differences between classical and atypical scrapie which are the topic of current TSE research. Whereas there have been many thousands of animals with classical scrapie worldwide, the number of atypical cases stands currently at only several hundred. Most cases of atypical scrapie are found in animals of *PrP* genotype risk groups R1-R3 which are the groups that show low susceptibility to classical scrapie, Studies of atypical scrapie from Norway [68], Germany [64], France [5] and the UK [78] all come to the same conclusion, namely that susceptibility is associated with *PrP* codons 141 and 154. Sheep of AHQ/AHQ and AHQ/ARQ genotypes were overrepresented in cases versus controls, and this may also apply to goat breeds that carry the AHQ allele [5]. The $AF_{141}RQ$ allele conferred higher susceptibility than the $AL_{141}RQ$ allele. Indeed, the $AF_{141}RQ$ allele may represent a higher risk than the AHQ allele. Surprisingly, ARR/ARR animals are also susceptible to atypical scrapie [16]. In light of these findings a review of the $AF_{141}RQ$ allele frequency in a total of 15 777 ARQ alleles from flocks in various countries revealed 1 833 $AF_{141}RQ$ alleles (11.6%) [36, 38, 61, 64, 68, 78]. There appears to be quite a difference in the frequency of $AF_{141}RQ$ in the UK flocks (21%) compared to the rest of the world (5%). Whether this difference is due to the selection of the flocks in the studies or reflects a true difference remains to be established. $AF_{141}RQ$ is certainly not a rare allele and homozygous $AF_{141}RQ/AF_{141}RQ$ sheep are found regularly. When comparing averages from different breeds in different countries the AHQ allele frequency range appears to be 0.2% (USA) [21] to 12.5% (Norway) [68, 88]. The mean of the AHQ frequency for the 20 studies (see above) is 6.3% and regional frequencies are 2.5% for Italy and Spain [1, 2, 4, 27], 3.8% for Iceland [86], 9.6% for Greece [12, 24] and 7.1% for New Zealand [14]. These data suggest that susceptible genotypes are available in most populations and also that genetic screening could be used for susceptibility control.

4.3. Scrapie in goats

Goat TSE genetic studies also have their origin in experimental challenges. Intracerebral inoculations of goats with scrapie resulted always in disease in all animals, their incubation periods were often relatively short and tightly grouped [75]. However, in many countries the prevalence of natural goat scrapie is much lower compared with sheep. Whether this is due to different *PrP* genetics or different agent strains remains to be established. Additionally, future epidemiological studies will show whether mixed sheep/goat holdings, a common practice in Mediterranean countries but rare in Northern Europe such as the UK, are a risk factor.

The first polymorphism that could be associated with experimental scrapie was I142M, however the $AM_{142}RQ$ allele did not alter susceptibility. IM_{142} heterozygotes had a

lengthened incubation period after experimental inoculation with BSE and scrapie [32]. A PrP variant with three repeats and an additional W102G polymorphism was also associated with longer incubation periods after experimental challenges [33]. Polymorphisms with some resistance (low risk) association to scrapie are H143R, N146S/D, R154H and Q222K [3, 11, 74, 92], but as yet numbers are still small to conclude whether these polymorphisms result in complete resistance to all classical scrapie strains. Heterozygote HR_{143}, RH_{154} or QK_{222} animals all seem to be more protected compared to HH_{143}, RR_{154} or QQ_{222} homozygote animals. Codons 136 and 171 have not been found polymorphic in goat *PrP*, so that all goat alleles are equivalent to the ARQ or AHQ alleles of sheep. The equivalence for sheep and goats in low risk association between RH_{154} genotype and classical scrapie but high risk association between RH_{154} and atypical scrapie [5] implies that the mechanisms underlying the interactions between PrP and agent are the same in different species, therefore highlighting the fact that it ought to be possible to establish general rules for *PrP* genetics. We may therefore deduce for example that R143 in sheep will also have a low risk association.

4.4. Chronic wasting disease in deer

Genetic susceptibility to natural disease is investigated by comparing the proportion of affected and unaffected animals in relation to their genotype. This model assumes uniform exposure of the population to the TSE agent, which may be a special problem when the exposure of free-ranging populations is investigated. Even so, a statistical significant bias in the *PrP* genotypes between CWD-affected and healthy white-tailed deer has been found in captive [73] and free-ranging populations [55]. The data suggested that the polymorphisms Q95H and G96S reduce the risk of infection. Homozygote SS_{96} as well as heterozygote GS_{96} and GH_{95} deer are underrepresented in CWD-affected populations [55, 73]. CWD in mule deer was also shown to have a genetic component with the polymorphism S225F. Heterozygote SF_{225} are significantly less common in CWD-affected deer both in Wyoming and Colorado [53]. None of the genotypes seem to confer full resistance to CWD.

Free-ranging and farmed CWD-affected wapiti (Rocky Mountain elk) were reported to have an association with polymorphism M132L, in which again heterozygote ML_{132}have some protection from CWD [72]. This view has been challenged by a recent study of Colorado wapiti CWD, in which ML_{132} cases are not uncommon (Perucchini, Miller, Goldmann personal observations).

4.5. BSE in cattle

No association between BSE susceptibility and cattle *PrP* alleles with six or five repeats has been found [46]. There is also as yet no other PrP protein polymorphism in cattle that can be associated with BSE. However the recently discovered *PrP* promoter polymorphisms may be associated with susceptibility to BSE in British and German herds [41, 56]. The main effect is with the 12 bp deletion allele (12del). Homozygous 12del/12del and heterozygous 12del/12ins animals appear more at risk to develop BSE than homozygous 12ins/12ins animals. The highest risk is associated with the deletion of both, motifs in the following genotype: 23del-12del/23del-12del. A model that links *PrP* expression with disease may be developed, in which interaction between transcription factors binding differentially to the polymorphic motifs regulates *PrP* expression in tissues that are important for BSE. Although there are still many questions to be answered, there may be at last a genetic association to BSE susceptibility.

5. CONCLUSION

This review has shown that the control of TSE in ruminants should be possible by using our knowledge of *PrP* genetics and yet the occurrence of atypical scrapie puts exactly this ability to control scrapie into question. It very much appears as if all the effort made to breed for classical scrapie resistance could ultimately lead to an increased risk for the population to have carriers of atypical scrapie. One

of the hot issues in the coming years will therefore be the search for an explanation for why the susceptibility for both forms of scrapie apparently resides at the opposite spectrum of the known *PrP* genetics. It may reflect the selection by two different agent strains or involve novel *PrP* or non-*PrP* genetics.

There is no equivalent in ruminants to the human disease-linked *PrP* mutations [66]. *PrP* polymorphisms are more likely to be found in survivors than affected animals, with one noticeable exception, the VRQ allele. Although VRQ/VRQ animals are at extreme high disease risk when in infected populations, the heterozygote genotypes VRQ/ARR and VRQ/AHQ are of very low risk to both types of scrapie. This may explain why the VRQ allele has been maintained in many sheep population. It is of interest to ask why there are so many PrP variants in ruminants and especially sheep. Is the maintenance of a large number of alleles (balancing selection) within these species contributing to a TSE survival advantage? It is certainly seen in many TSE models that heterozygous allele combinations exhibit a lengthening of the incubation period or reduced susceptibility. Understanding the genetic variability of *PrP* in various species and the selection forces acting on the gene may therefore help us to decide breeding strategies in TSE affected species.

Up to very recently it was believed that there could be an absolute resistance in the presence of *PrP* expression as opposed to the *PrP* gene knock-out effect seen in mice. The ARR/ ARR genotype was the model, it produced apparent resistance in sheep and it was hoped that similar genotypes would eventually be found in the other ruminant species. Having the proof that all PrP protein variants including ARR can be converted to abnormal isoforms, it is now likely that only relative resistance can be achieved as long as PrP protein is expressed in the organism. Only by using genetic manipulation technologies will it be shown whether the elimination of *PrP* expression can produce absolute resistance linked to normal livestock capable of withstanding the stress of the farm environment and normal social animal interactions.

Not all observed disease modulation can be followed back to the *PrP* genotype. This has been clear for a while and direct evidence exists for sheep that point to a few loci in the genome that have significant additional influence. It has been difficult however to specify the gene or genes that reside within these loci. New technologies and pooled scrapie databases may enhance the chance to finally reveal these other genes. Out of this could emerge an additional genetic approach to control and eradicate TSE.

Acknowledgements. The author wishes to acknowledge the support by the NeuroPrion European Network of Excellence, Biotechnology and Biological Sciences Research Council, UK and Department of the Environment, Food and Rural Affairs, UK. Thanks also to the members of the NPU sheep TSE research groups.

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Review in Advance first posted online on October 2, 2014. (Changes may still occur before final publication online and in print.)

Chronic Wasting Disease of Cervids: Current Knowledge and Future Perspectives

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Annu. Rev. Anim. Biosci. 2015. 3:8.1–8.21

The *Annual Review of Animal Biosciences* is online at animal.annualreviews.org

This article's doi:
10.1146/annurev-animal-022114-111001

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Keywords

prion, transmission, detection, pathogenesis, chronic wasting disease, CWD, transmissible spongiform encephalopathy, TSE

Abstract

A naturally occurring transmissible spongiform encephalopathy (TSE) of mule deer was first reported in Colorado and Wyoming in 1967 and has since spread to other members of the cervid family in 22 states, 2 Canadian provinces, and the Republic of Korea. Chronic wasting disease (CWD), caused by exposure to an abnormally folded isoform of the cellular prion protein, is characterized by progressive neurological disease in susceptible natural and experimental hosts and is ultimately fatal. CWD is thought to be transmitted horizontally in excreta and through contaminated environments, features common to scrapie of sheep, though rare among TSEs. Evolving detection methods have revealed multiple strains of CWD and with continued development may lead to an effective antemortem test. Managing the spread of CWD, through the development of a vaccine or environmental cleanup strategies, is an active area of interest. As such, CWD represents a unique challenge in the study of prion diseases.

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INTRODUCTION

Chronic wasting disease (CWD) is a naturally occurring transmissible spongiform encephalopathy (TSE) affecting members of the cervid species, including whitetail and mule deer, wapiti, and moose. As with other TSE, including scrapie of sheep, transmissible mink encephalopathy, bovine spongiform encephalopathy, variant and sporadic Creutzfeldt-Jakob disease (CJD), and kuru, CWD is characterized by central nervous system pathology mediated by an abnormal isoform of the normal cellular prion protein (PrP^{C}). The cellular prion protein, encoded by the *Prnp* gene, is normally composed of multiple α-helices, though through mutation or coercion by an abnormal exogenous or endogenous isoform, it may convert to a tertiary structure that is primarily β-sheet in nature. This structural change renders it resistant to manifold physical conditions, including protease digestion, extreme temperatures, and standard disinfection protocols. It is this resistance to degradation that has led to the designation PrP^{res} for the abnormal prion isoform, also denoted as PrP^{d}, for disease-causing prion protein.

NATURAL HISTORY OF CHRONIC WASTING DISEASE

CWD was first identified in 1967 in a closed herd of captive mule deer in studies conducted jointly through Colorado State University and the University of Wyoming. Initially reported as a syndrome of wasting and progressive neurological disease, CWD was ultimately classified as a TSE in 1980 (1). Initially limited to captive mule deer, the disease was later identified in captive and free-ranging wapiti, mule and white-tailed deer, and moose (2–5). Although originally restricted to a loosely defined area of northern Colorado and southern Wyoming, the epidemic has since expanded laterally to Utah, Nebraska, Kansas, and South Dakota, with new epidemic foci identified in southern Wisconsin and northern Illinois, northern West Virginia, Maryland, Pennsylvania and Virginia, southern New Mexico, and far west Texas, as well as the Canadian provinces of Alberta and Saskatchewan (6–13). Smaller foci have been reported in 11 other states and the Republic of Korea (14, 15). Up to half of these foci have arisen in and were limited to farmed cervids, only rarely spilling over to or independently identified in sympatric free-ranging cervids (7, 16) (**Figure 1**).

STRUCTURE OF THE CERVID PRION GENE AND PROTEIN

The cervid prion gene, *Prnp*, like other mammalian prion genes, is a member of the *Prn* gene family, which also includes Doppel (*Prnd*) and Shadoo (*Sprn*) (17, 18). The *Prnp* gene is highly conserved among mammals and in deer spans three exons, with the third exon encoding the open reading frame (19–21). An unexpressed, processed pseudogene ($Prnp^{\varphi}$) has also been described in white-tailed and mule deer, though it has no reported relationship to susceptibility or pathogenesis (21, 22).

The normal cervid prion protein (PrP^{C}), as with its gene, is highly conserved among mammals (>90%), with high sequence identity to the cellular prions of reptiles and birds as well (≥30%) (19, 23). The translated protein consists of ~256 amino acids, with signal peptides at both the amino and carboxyl termini, which direct transport to the endoplasmic reticulum, and addition of a glycophosphatidylinositol anchor for cell membrane attachment, respectively (24, 25). The amino terminus, roughly 100 amino acids in length, lacks any definite tertiary structure but does harbor a series of five octapeptide repeats (e.g., GGWGQPHG), which are thought to be involved in binding divalent metals (26). The carboxyl terminus, in contrast, is very highly structured, with three α-helices and two short, antiparallel β-sheets. Typical to other mammalian prion proteins, the carboxyl terminus also has residues to allow for glycosylation and a single disulfide bridge (**Figure 2**).

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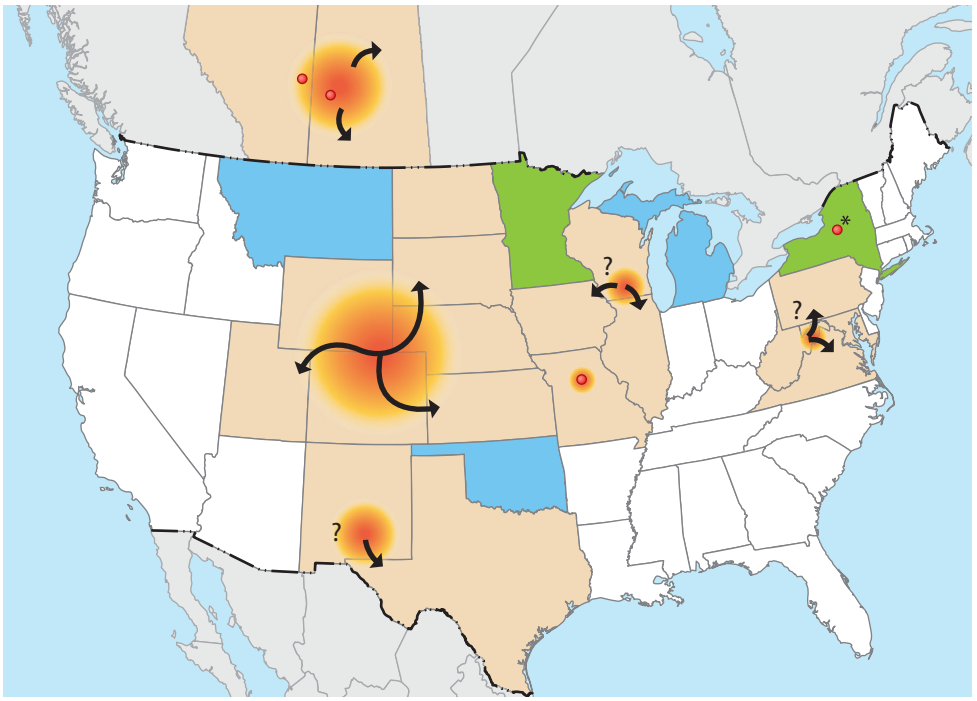

Figure 1

North American distribution of chronic wasting disease (CWD). With an original epidemic focus in northern Colorado and southern Wyoming, CWD has slowly proliferated in captive and free-ranging populations and has now been reported in 22 states and 2 Canadian provinces, as well as the Republic of Korea. States colored tan have ongoing CWD persistence in free-ranging populations, whereas those in blue have limited infection to rare cases in farmed cervids. States in green have reported CWD in wild cervids, though at present indications are that the disease has been eradicated from free-ranging populations. Local foci of infections believed to have originated in farmed cervids are indicated by a red dot, whereas New York State (*asterisk*) represents an unusual circumstance where the disease is thought to have arisen in farmed cervids, spread to wild cervids, and was subsequently eradicated. Question marks indicate foci for which the origin and dispersion patterns, indicated by arrows, are unknown.

The function of the cervid prion protein is unknown, though multiple studies in *Prnp* knockout mice and cattle, and the identification of a group of goats naturally lacking prion protein expression, have shown that the gene is not required for survival. Phenotypically, PrP^{C}-knockout mice may exhibit altered sleep patterns, sensory deficits, and various nervous and immune system pathologies (27–30), whereas both goats with a premature stop codon in the *Prnp* gene and $PrP^{0/0}$ cattle appear clinically and physiologically normal (31, 32).

GENETIC CORRELATES OF INFECTION IN CERVIDS

In early studies of scrapie in mice, it was discovered that variations in the *Sinc* (scrapie incubation period) gene—later identified as the *Prnp* gene—affected the incubation period of infection (33). These findings were eventually applied to investigations in sheep, where several *Prnp* alleles were found to affect susceptibility or resistance to scrapie infection (34–36). Since then, allelic variants have been identified in cattle (37), humans (38, 39), and more recently cervids, as has been

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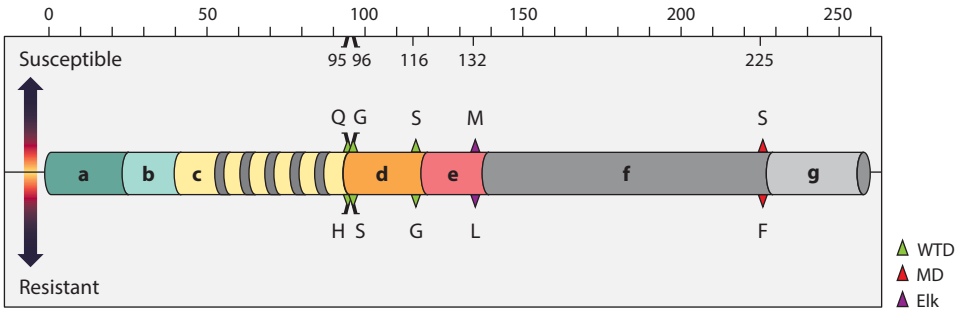

Figure 2

Structure of the cervid prion protein and important allelic variants. The cervid prion protein may be divided into several distinct regions: signal peptides directing transport to the endoplasmic reticulum and addition of a glycophosphatidylinositol anchor (a and g, respectively), areas of charged amino acids (b and d), a series of five octapeptide repeats (c), a region of hydrophobic amino acids where the protein is thought to span the cell membrane (e), and a carboxyl-terminus sequence where organized tertiary folding and posttranslational processing (e.g., glycosylation) are thought to occur (f). Specific amino acids crucial for chronic wasting disease (CWD) resistance or susceptibility are indicated for each species studied to date: In white-tailed deer, 95H, 96S, and 116G have independently been identified to promote resistance to CWD, whereas 132L and 225F are thought to impart resistance in elk and mule deer, respectively. Abbreviations: MD, mule deer; WTD, white-tailed deer.

reviewed recently (40). These variants may influence free-ranging population dynamics and could be relevant to the cervid production industry (see Management, below) (41).

Of the four identified polymorphisms in white-tailed deer (Q95H, G96S, A116G, and Q226K), three have been found to be overrepresented in field cases of CWD: 95Q, 96G, and 116A (40) (**Figure 2**). Interestingly, the alternate alleles are each found at low to very low frequencies in free-ranging white-tailed deer (<~25% of animals genotyped). Although cervids with a 96S allele have been shown to have extremely prolonged incubation periods (130–230% of that of 96GG homozygotic controls), transgenic mouse experiments found the 96S allele actively inhibited infection, with 96S homozygotes strongly resistant to infection (42, 43). It is not surprising, then, that this locus may contribute to selection pressure in CWD-endemic areas (41).

Relatively fewer alleles governing susceptibility in mule deer and elk have been identified. Mule deer with the 225F allele, again found at a very low frequency in the wild, have been reported to have prolonged incubation periods as compared with 225S homozygous mule deer (44). Codon 132 in elk (e.g., M132L), with relatively higher frequency in natural populations, has also been reported to influence susceptibility (45); however, further studies are necessary to verify that 132M homozygotes are indeed more susceptible to infection.

GEOGRAPHICAL DISTRIBUTION OF CHRONIC WASTING DISEASE

The geographical distribution of CWD may be considered as two lineages: (*a*) the slow proliferation of disease among free-ranging cervids, with often stable prevalence and slow rates of diffusion, and (*b*) the dispersion within herds of captive cervids. Epidemic foci among captive herds are typically limited in duration and prevalence; however, in unusual circumstances, prevalence may approach 80–90% of animals and only rarely crosses over into free-ranging populations (1, 16, 46–48).

Among free-ranging cervids, CWD has been identified in 19 American states and 2 Canadian provinces. Initially, the primary endemic zone was limited to northeastern Colorado and

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southeastern Wyoming in the United States, though in 1996 a new focus was identified in Saskatchewan, Canada (49). A third endemic focus was later identified in southern Wisconsin in 2002 (50), and eventually separate foci were reported in New Mexico, New York, West Virginia, Missouri, and Minnesota. Very little is known about the epidemiology behind these foci—whether they are extensions of the original endemic focus or secondary foci, or if they represent a distinct, spontaneous development of prion disease in cervids. In any case, the disease has slowly diffused from the endemic zones in each of these locales, apparently following riparian and sylvan corridors (51).

The propagation of CWD in captive herds has followed a slightly different path. Identification in farmed cervids has typically occurred in areas without previous reports of CWD, where it is almost always contained on site. Occasionally, identification of CWD in captive herds precedes or overlaps with the detection of the disease in free-ranging animals, including Saskatchewan (1996–2001), New York State (2005), and Missouri (2010) (7, 8, 48, 52). Often this is an implied spillover of infection from captive to free-ranging animals (53); however, without the appropriate tools to distinguish CWD prion strains or more thoroughly study the focus epidemiologically, this may remain speculative, as it is also plausible that CWD may have moved from free-ranging deer into captive populations in these instances.

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HOST RANGE OF CHRONIC WASTING DISEASE

Following its initial report in mule deer, the known host range of CWD has expanded to encompass most of the members of the family Cervidae. Not long after its initial description as a wasting disease of captive mule deer, CWD was also found to affect wapiti, or Rocky Mountain elk, in Colorado in 1981 (2) and was later identified in white-tailed deer in Nebraska and South Dakota in 2001 (54). Long thought to be resistant to CWD, in 2005 a free-ranging moose (*Alces alces*) harvested by a hunter in Jackson County, Colorado, tested positive for the disease (4). Subsequently, CWD was reported in captive moose in Wyoming and again in free-ranging moose in Colorado and Wyoming, and recently in Alberta, Canada (5, 55, 56). The total number of moose reported with CWD has been very low ($n = 6$) relative to the thousands of deer and elk identified over the past three to four decades.

Although not sympatric to deer, elk, or moose in the CWD endemic area, other cervid species have proven to be experimentally susceptible to CWD following experimental challenge. These include Eurasian red deer (*Cervus elaphus*) (57) and fallow deer (*Dama dama*) (58), Asian muntjac (*Muntiacus reevesi*) (59), and arctic/subarctic reindeer or caribou (*Rangifer tarandus*) (60). Each of these species has both captive and free-ranging counterparts across the globe and, because of their susceptibility, should be considered in routine CWD/TSE surveillance.

PATHOGENESIS IN THE NATURAL HOST

Much of what has been reported on the pathogenesis of CWD has been predicted from studies on sheep scrapie; indeed, the two TSEs show remarkable similarity in their modes of transmission (via direct contact or contaminated environmental fomites), incubation period (18 months–5 years), and pathology (54, 61), and as such, an extrapolation of pathogenesis of CWD from scrapie studies and vice-versa seems justified, albeit not absolute. The infectious CWD prion is thought to initially cross the alimentary epithelium after ingestion of contaminated material and progresses relatively quickly to lymphoid centers associated with the alimentary tract, including tonsil and retropharyngeal lymph nodes (RLNs) (62). It is thought that the sympathetic fibers associated with the germinal centers of these lymphoid tissues direct prion proliferation to the central nervous

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system, though it is worth noting that in a sizable percentage of elk (10–15%), no evidence for lymphoid involvement can be found using conventional methods (54). From these ascending fibers of the autonomic nervous system, the infectious prions and PrP^d are typically found along with spongiform degeneration of the dorsal motor nucleus of the vagus nerve in the obex region of the medulla oblongata. Progressive and more widespread prion deposition throughout the central nervous system is thought to occur very close to the onset of clinical disease, based on studies that systematically scored central nervous system tissues (63, 64).

A key component of pathogenesis that requires further investigation is the accumulation of PrP^d in peripheral tissues, e.g., nasal mucosa, tonsil, salivary glands, taste buds, kidneys, bladder, intestine, and rectoanal mucosa–associated lymphoid tissue, and its association with the onset of shedding in excreta. Peripheral accumulation has been thought to occur only after central nervous system replication; however, recent findings have shown that shedding in excreta may begin concurrent with peripheral lymphoid accumulation (N.J. Haley, unpublished data). Although examination of peripheral tissues from end-stage animals has demonstrated amplifiable CWD prions in peripheral tissues, a more thorough serial analysis of peripheral tissues over the course of infection would shed greater light on the timing of CWD appearance in the periphery.

CLINICAL AND PATHOLOGICAL SIGNS

Following a variable incubation period (dependent on, for example, exposure dose and genotype), experimentally infected cervids may exhibit clinical periods over a few weeks to a few months (65–67). Earliest symptoms of clinical disease include behavioral and subtle locomotive changes. Subsequent signs include progressive weight loss, bruxism, altered posture and head placement, head tremors, and ataxia. Paradoxical polydypsia and polyphagia in the face of weight and muscle mass loss are hallmarks of the symptomatic phase of CWD. Interestingly, symptoms of sialorrhea and polydypsia/polyuria likely contribute to late-stage shedding of infectious prions (65, 68). Although the progress of clinical disease is less documentable in wild cervids, CWD-positive animals are more likely to succumb to vehicular and predator-related fatalities, likely owing to subclinical neurological disease (69, 70).

It is very difficult to diagnose CWD on gross necropsy, as many of the signs of the disease are nonspecific (54). Despite its nomenclature, CWD-positive cervids may often have average body condition, as weight loss typically occurs in later stages of disease, and wild cervids may succumb to earlier fatal factors (49, 54, 69–71). Affected cervids may be considered in poor thrift with roughened hair coats; additionally, esophageal dilatation, regurgitation, and evidence of aspiration pneumonia may be present (54).

On microscopic examination, neuronal degeneration and astrocytosis are prominent findings bilaterally in the gray matter of the diencephalon, olfactory cortex, and medulla (54, 72). The dorsal motor nucleus of the vagus, acting as the proposed conduit between peripheral exposure and central disease, is an area of the central nervous system commonly demonstrating spongiform degeneration early in the course of infection. Amyloid plaques, occasionally florid in nature (i.e., among vacuolar degeneration of the neuropil), are common, in contrast to the granular plaques common to bovine spongiform encephalopathy (BSE). Immunohistochemistry (IHC) demonstrates widespread, and especially perineuronal and perivascular, PrP^d reactivity. Lymphoid tissues, e.g., lymph nodes and spleen, demonstrate PrP^d deposition in germinal centers and follicles, with increased accumulation and dissemination over the course of disease. PrP^d may also be detectable in neuroendocrine tissues throughout the body, including pancreatic islet and adrenal medullary cells and enteric ganglia and nerve plexuses (73).

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CHRONIC WASTING DISEASE IN EXPERIMENTAL, NONTRANSGENIC HOSTS

CWD has been experimentally transmitted through various routes (e.g., intracerebral inoculation) to various species, including rodents (voles, *Myodes glareolus*, and hamsters, family Cricetidae) (74–76), carnivores (ferrets, *Mustela putorius*, and cats, *Felis catus*) (77–79), other ruminants (cattle, *Bos primigenius taurus*) (80, 81), and nonhuman primates (squirrel monkeys, *Saimiri sciureus*) (82, 83). These species have served as both model species for the study of CWD pathogenesis (e.g., ferrets and hamsters) and experimental species for the study of transmission barriers relevant to human and livestock health, or to identify potential natural reservoir species (e.g., voles). In many cases, CWD isolates were subpassaged and adapted to allow correlation to known species-specific TSEs (e.g., BSE, transmissible mink encephalopathy, and feline spongiform encephalopathy), as well as to analyze prion protein alterations associated with trans-species infection and replication.

In rodents, several studies have evaluated the susceptibility of common laboratory species (e.g., hamsters) or wild species (e.g., voles) to CWD. Relying on intracerebral inoculation, these studies have demonstrated relatively short incubation periods (6–12 months), with a variety of species-typical clinical and strain-specific pathological findings. Both hamsters and voles exhibited clinical patterns of progressive neurological dysfunction, including head bobbing and ataxia, though the observed duration of signs is reported to be quite short (75). Central nervous system pathology characteristic of TSEs, specifically moderate spongiosis, astrocytosis, and neuronal loss, were observed in rodents, whereas biochemical analysis showed subtle changes between cervid and rodent-passaged PrP^d (75, 76).

Ferrets have been studied as an experimental model for CWD pathogenesis in the past decade, though their utility has waned with the introduction of transgenic murine model systems (84). On primary passage, incubation periods in ferrets are typically long (15–20 months), with successful transmission observed only in intracerebrally inoculated animals (79, 85). Clinical disease, distinct from those seen in mink with TME, was observed over several weeks, with animals demonstrating isolation, polyphagia, and somnolescence, progressing to torticollis and ataxia. Subsequent passages of ferret CWD led to more facile oral transmission and incubation times ranging from 4.5 to 9 months, correlating to various CWD isolates (see below, Strains of CWD) (77, 85, 86). Microscopic examination of central nervous system tissues found spongiosis in the basal ganglia, thalamus, optic chiasm, midbrain, and pons. PrP^d aggregates were small, coarse, and neuronally associated. Ferret-adapted CWD showed similar lesions as primary passaged material, though they were more extensive in nature. In contrast to what has been reported in other experimental hosts, western blot analysis demonstrated ferret PrP^d glycoform patterns similar to those seen in parent deer isolates (86).

In 1988, a novel TSE among domestic and wild felids was identified and correlated to exposure to BSE-contaminated feedstuff: feline spongiform encephalopathy (87–89). Accordingly, studies evaluating the susceptibility of domestic cats to CWD were undertaken. Through intracerebral inoculation, primary passage of CWD into cats was found to have very long incubation periods (45–47 months) and low attack rates (40%) (78). As was observed in ferrets, oral transmission was unsuccessful. On secondary passage, however, incubation periods were drastically shortened (23–27 months), with complete attack rates and the renewed potential for oral transmission. Affected cats showed gait abnormalities, weight loss and anorexia, and polydypsia, along with aggression and hyperreactivity. Pathological lesions were observed primarily in the obex and caudal brainstem, including the dorsal motor nucleus of the vagus, with more extensive and heterogeneous lesions seen on secondary passage. PrP^d aggregates were finely granular and perineural to

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intraneuronal, similar to that reported in ferrets, though distinct from neuropathological profiles observed in either CWD or classic feline spongiform encephalopathy (90). Glycoform patterns showed a lower molecular weight and altered immunoreactivity compared with parent CWD strains (78). Work is currently ongoing to identify whether sympatric felid species (e.g., North American cougar, *Puma concolor*) may be susceptible to CDW infection (M. Miller, personal communication).

In an effort to evaluate the susceptibility of domestic cattle to CWD, several studies evaluating various isolates of CWD (e.g., mule deer, white-tailed deer, and elk sources) through multiple passages have been reported (80, 81, 91). Incubation periods in intracerebrally inoculated cattle have been variable and isolate dependent, ranging from 18 to 63 months and demonstrating variable attack rates. To date, no evidence of oral transmission of CWD to cattle has been reported (58, 80, 81). Clinical signs in affected cattle range from subtle signs to signs similar to those of BSE: circling, weight loss, bruxism, and general depression. Central nervous system lesions were infrequent, though multifocal PrP^d staining in particulate or granular deposition patterns proximal to astrocytes, with occasional small aggregates or plaques, was observed. These findings are distinct from the classic spongiform lesions and diffuse PrP^d distribution in linear and granular patterns in the neuropil of cattle affected with BSE (91). The PrP^d molecular weight profiles seen in bovine CWD were reportedly lower than those observed with both parent CWD strains and BSE, with very little apparent difference in glycoform distribution.

Given the definitive link between BSE and variant CJD, several studies assessing the susceptibility of primates to CWD have also been undertaken. Although evidence from transgenic, humanized PrP mice showed a likely species barrier (92), thorough studies by several groups have shown that some primate species may in fact be susceptible to CWD infection. Transmission studies in rhesus macaques have to date been negative; however, squirrel monkeys have been found to be susceptible to CWD following both oral and intracerebral inoculation (82, 93). Incubation periods were generally long (31–53 months), with low to moderate attack rates (3/15 animals and 11/13 animals following oral and intracerebral inoculation, respectively). Lesions were observed throughout the central nervous system, including spongiosis and variably sized plaques. Interestingly, subpassage of squirrel monkey tissues into tgDeerPrP mice failed to produce infection, possibly indicating a loss of host range (82). Despite the results in New World monkeys, to date no reports of an increased risk of CJD have been reported in individuals consuming venison, with both retrospective and prospective studies reported in the literature (94–96).

TRANSMISSION OF CHRONIC WASTING DISEASE AND ENVIRONMENTAL PERSISTENCE

CWD's efficient horizontal transmission has been an active area of research in recent years, and both environmental contamination (and persistence) and excreta (e.g., saliva, urine, and feces) are thought to play a pivotal role in the rapid proliferation of CWD across North America over the past five decades. Initial studies by Miller and colleagues (66) clearly demonstrated that naïve mule deer exposed to infected cohorts would eventually develop and succumb to CWD. Moreover, the physical presence of an infected animal was not required for transmission; animals housed in pens that previously held infected animals were also at risk, implying fomites contaminated through excreta or decomposing carcasses also contributed to horizontal transmission (66).

Building from this study, Mathiason et al. (65, 67) focused on specific forms of excreta by exposing naïve cervids to saliva or urine and feces from preclinical or clinically ill, CWD-positive deer. In these studies, saliva showed the clearest potential for contributing to horizontal

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transmission: Of six deer exposed to saliva by the oral route, five became infected as early as 12 months postexposure, as evidenced by antemortem tonsil biopsy IHC. Clinical, IHC, or western blot evidence of CWD infection has not been reported in several deer inoculated with urine and/or feces following 18+ months of incubation, though later bioassay and in vitro amplification studies provided evidence that many of these deer were subclinically infected at the time of necropsy (97). Further studies in transgenic, cervidized tg[CerPrP] mice found that urine and feces (as well as saliva) were overtly infectious in this experimental mouse model (68, 98). Oftentimes, in vitro amplification assays have supported these vivo findings—with PrP^d demonstrated by seeded amplification in each form of excreta (68, 99, 100).

Transgenic, cervidized mice have also been integral in narrowing down the onset of shedding in bodily fluids. Recent research systematically evaluating saliva, urine, and feces has demonstrated that infectivity in saliva and feces may initially appear as early as 9–12 months postexposure, long before the onset of clinical signs (N.J. Haley, unpublished data; 98). Infectivity in urine, however, was observed at very low levels in samples collected very late in disease. Calculations of cumulative infectivity doses in each form of excreta approached that found in the central nervous system, emphasizing their role in the persistence of infection in cervid species (N.J. Haley, unpublished data; 98, 101).

The spread of infectious prions through excreta and decomposing carcasses is likely only part of the transmission puzzle, however. Unlike many other infectious diseases, the prion agent is remarkably stable in the environment, persisting for many years at sites housing TSE-affected animals (66, 102). Although this persistence likely is partly due to the protein's hardy biochemical properties, much research in recent years has gone into investigating its ready binding to soil (103–106). Cervids and other ruminants, through grazing behaviors, have very close contact with the soil, so it is perhaps unsurprising that research has been directed at identifying which particular soil components may be involved in prion persistence and the kinetics under which prion/soil binding occurs.

Through a solution-depletion approach, by which the amount of PrP^d in solution is measured before and after addition of soil, researchers have found that infectious prions may bind rapidly and vigorously to various minerals and soil compositions, especially montmorillonite clay and quartz (106). Interestingly, these soil types have been found to very closely correlate with prevalence of CWD in endemic areas (107, 108). The flexible amino-terminus, with a higher proportion of positively charged amino acids, has been found to be crucial to soil binding; proteinase K digestion, which cleaves PrP^d within this flexible N terminus, has been used to dissociate bound prions from soil for analysis (109). Once bound to soil, the prion protein has very little mobility, potentially keeping it very close to the soil surface and perhaps even enhancing ruminant contact (110).

Soil binding may provide one other advantage to the infectious prion protein: Some studies have found that soil-bound prions may in fact be more infectious than unbound prions in mouse models, reducing incubation periods and increasing attack rates (103, 104). Other researchers have found that soil-bound prions may instead reduce infectivity in both in vivo and in vitro models of infectivity (111). Infectivity may ultimately relate to the type of soil bound to the infectious prion protein, though at the very least the prion-soil relationship likely allows infectivity to persist for decades (66, 102, 111).

EVIDENCE FOR CHRONIC WASTING DISEASE STRAINS

Although many TSEs tend to be relatively species specific, various different strains or isotypes have been identified within each clade of disease, e.g., scrapie (263K, ME7, RML, classical and atypical

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scrapie), BSE (atypical BSE - BASE), and CJD (kuru, CJD, variant CJD, Gerstmann-Straussler-Scheinker syndrome). CWD is not unique among TSEs, in that there have been multiple reports outlining evidence for strains of CWD (76, 85, 112). These strains may be partially species specific (i.e., relatively more or less common in deer or elk), or potential quasispecies or multiple conformers, replicating independently within an individual animal.

The criteria for distinguishing CWD strains are primarily based on several metrics from passage of isolates in susceptible hosts: (*a*) average incubation periods, (*b*) range of clinical signs, (*c*) the distribution of central nervous system pathology, and (*d*) PrP^{d} biochemical characteristics. Based on bioassay studies, including passage of CWD into ferrets, hamsters, and cervidized mice, at least two putative strains of CWD have been proposed (e.g., CWD1 and CWD2; $SghaCWD^{md\text{-}f}$ and $SghaCWD^{md\text{-}s}$; CWD-CSU and CWD-WI) (76, 85, 112) (**Table 1**). Although each of these isolated strains has not been evaluated in cross-species experiments to verify a consistent phenotypic pattern, one strain typically produces a much shorter incubation period (e.g., approximately five months in ferrets, approximately three months in hamsters, and approximately seven months in transgenic mice) and a wide distribution of PrP^{d} deposition, whereas the second has a somewhat longer incubation period and a more limited PrP^{d} lesion profile. Attack rates, clinical signs, and disease progression may also vary between CWD strains, although the biochemical properties (e.g., glycosylation pattern and guanidine hydrochloride denaturation profiles) are often indistinguishable between the two isolates.

CONVENTIONAL AND EXPERIMENTAL DETECTION OF CHRONIC WASTING DISEASE PRIONS

Since the original reports of CWD in 1967 and its initial classification as a TSE in 1980, the detection of infection has improved significantly from a purely histopathological diagnosis to seeded amplification assays, such as protein misfolding cyclic amplification (PMCA) and real-time quaking-induced conversion (RT-QuIC) (1, 100, 113). Despite the lack of a nucleic acid sequence—the basis of assays such as polymerase chain reaction—these in vitro prion amplification methods are quickly taking the place of in vivo infectivity assays. Prion disease detection has also evolved from strictly postmortem sampling to increased interest (and success) in antemortem diagnosis, offering the potential for testing prior to animal movement and surveillance of susceptible threatened or endangered species (114–117).

The early detection of CWD infection was limited to microscopic evaluation for the classic TSE pathological signature: spongiform degeneration, astrocytosis, and florid plaques that may

Table 1 Summary of evidence for strains in experimental cross-species transmission of chronic wasting disease

Experimental species	Strain identification	Incubation period (range)	Central nervous system pathology	Reference
Ferrets (*Mustela putorius*)	CWD-WI	8.4–15.9 months	Substantial PrP^{d} deposition	85
	CWD-CSU	3.5–6.6 months	Comparably limited PrP^{d} deposition	
Syrian hamsters (*Mesocricetus auratus*)	$SghaCWD^{md\text{-}f}$	85–89 days	Widespread PrP^{d} deposition and gliosis	76
	$SghaCWD^{md\text{-}s}$	485–544 days	Limited PrP^{d} deposition and gliosis	
Tg[CerPrP] mice	CWD1	225+/−18 days	Symmetrical PrP^{d} deposition and gliosis	112
	CWD2	301+/−35 days	Asymmetrical PrP^{d} deposition and gliosis	

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be more visible following silver or amyloid binding molecule (e.g., Congo red or thioflavin T) staining (54, 72). The obex, a region of the medulla oblongata proximal to the transition of the fourth ventricle into the central spinal canal and harboring the dorsal motor nucleus of the vagus, as noted above, was identified as one of the earliest sites of central nervous system pathology. Immunohistochemical techniques, and later western blotting and ELISA—first reported more than a decade after its initial classification as a TSE—advanced both clinical and experimental studies on CWD (118–120). The ability to identify CWD-positive animals by immunoassay permitted sensitive and specific diagnosis, rapid surveillance ability, and enhanced pathogenesis studies. Evaluation of peripheral lymph nodes allowed a greater understanding of the involvement of the lymphoid system in the migration of CWD from the gastrointestinal tract to the central nervous system and proved to allow earlier and more sensitive detection of CWD infection in deer through RLN analysis (63). As noted above, RLN evaluation alone may miss up to 10–15% of elk infected with CWD, implying variable pathogenesis among cervid species. As a result, IHC of obex sections may still be considered the gold standard for CWD diagnosis in cervids (54).

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Although immunoassays like IHC and ELISA are quite capable of detecting CWD infection with good sensitivity and very high specificity (97, 121), these early in vitro assays were unable to reveal whether or not a given sample was infectious and were not sensitive enough for the identification of CWD prions in body fluids and subclinically infected animals (68, 97). Bioassay, either in the natural host or in transgenic mice developed to express the cervid prion protein, has served as both the standard for prion infectivity and identification of infected tissues and infectious body fluids (84, 122, 123). As mentioned above, transgenic mouse models have been integral to the identification of infectious prions in the central nervous system and lymphoid tissues, saliva, urine, and feces. Following titration of infected brain pools in these mice, it is also possible to estimate the infectious doses present in these samples, providing estimates helpful for disease modeling and mitigation of transmission (98, 101).

Whereas bioassay may be the standard for detecting infectivity, ethical dilemmas as well as the costs of developing and maintaining transgenic models make in vitro amplification and detection systems more enticing. Extrapolating from in vivo work, in vitro assays initially focused on whole-brain homogenates for modeling prion amplification and infectivity (124). By using mouse brain as a substrate for PrP^C conversion, unknown seed or spike samples could be incubated and either shaken or sonicated to disrupt growing amyloid fibrils (124). The disrupted fibrillar prion protein could then go on to form additional fibrils, resulting in an amplification process that enhanced detection sensitivity several orders of magnitude greater than that of conventional western blotting. This PMCA process could be performed over successive rounds with fresh brain homogenate substrate over the course of 7–10 days, with ultimate evaluation by western blotting (125, 126).

To determine the minimal requirements for prion conversion in vitro, other researchers sought to take advantage of recombinant prion protein, in lieu of whole-brain homogenates, as a substrate for prion amplification. The continued pursuance of recombinant prion substrates led to the development of RT-QuIC (127). It is thought that, while the prion seed coerces the recombinant prion isoform into the abnormal β-sheet structure, thioflavin T added to the reaction is incorporated into the growing amyloid. Once bound, thioflavin T exhibits an altered spectrofluorimetric emission pattern, with increases in fluorescence monitored over time—usually 24–60 h (128–130). This approach has very much in common with real-time polymerase chain reaction, with a similar read out, and has allowed the detection of femtogram levels of infectious prions in tissues and body fluids, similar to the lower detection limit of bioassay (129). Based on this sensitivity, amplification assays such as PMCA and RT-QuIC may in many instances replace in vivo assay systems for the detection of ultra-low concentrations of PrP^d. Amplification-specific

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reagents, equipment, and expertise will for a time limit the widespread diagnostic application of these methodologies, however.

MANAGEMENT

As a result of differing management objectives, control of the spread of CWD necessarily must be tailored to either of the two populations affected: farmed and free-ranging cervids. The farmed cervid industry is very much like that of any agricultural production industry, and disease management and mitigation have benefited from the common practice of individual animal identification (for example, with cervid and bovine tuberculosis testing) and an annual census, combined with a herd certification approach. Postmortem CWD testing of all animals harvested on the farm or sent to slaughter is common practice. Upon identification of a positive case, herds are placed under quarantine prior to depopulation with or without indemnity; animals are then traced back to identify herd origin and tested for CWD. This level of surveillance far overshadows that available in field situations and is likely to have contributed to the timely identification of positive herds within the cervid industry. It may, however, lead to the false assumption that (because CWD may have been identified in farmed cervids prior to free-ranging cases) an epidemic focus originated on a farm.

The cervid farming industry would surely benefit from other mechanisms of disease control employed in agricultural production, including antemortem testing and enhanced biosecurity. The development of a simpler antemortem test for use prior to animal movement between farms or prior to the sale and distribution of live cervid products, including reproductive samples and antler velvet, would give producers and oversight agencies confidence in the movement of animals and animal products. Breeding for resistant genotypes, as has been increasingly successful in the management of scrapie, may also prove beneficial. Biosecurity measures commonplace in other production animal facilities, including double 8′ fencing, animal quarantine prior to introduction, and equipment cleaning, would be valuable additions to prevention and management strategies.

Management of CWD in free-ranging populations has understandably proven to be much more problematic. Although population reduction is often effective in reducing diseases spread by direct contact, when employed for CWD management it is often unsuccessful, perhaps owing to the magnitude and geographical breadth of the infected populations and underlying environmental contamination (131, 132). In two instances, herd reduction has been putatively effective in CWD control: central New York State and southeastern Minnesota (133, 134). Other attempts in CWD endemic areas, including Colorado, West Virginia, and Wisconsin, have not had any apparent effect on prevalence rates (132, 135, 136). Nonspecific culling, as with government-sponsored sharpshooters, has been reported to be more successful than publically mediated herd reduction (132). The aggregation of wildlife via feeding and baiting practices is sure to increase animal-animal contact and in many areas has been prohibited to lessen the opportunity for CWD spread (137). Control of CWD in the free-ranging cervid population thus represents a unique challenge with unknown consequences among prion disease.

FUTURE PERSPECTIVES

Despite the long-standing recognition of CWD and the wealth of progress made in the understanding of pathogenesis, transmission, and detection, several areas of research still require attention: (*a*) the development a true live-animal test with sensitivity greater than or equal to that of postmortem IHC or ELISA, (*b*) the ability to distinguish strains rapidly in vitro, (*c*) the construction of a successful vaccine target and strategy, and (*d*) the implementation of an effective

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environmental clean-up protocol. Advances in each of these areas would go great lengths in curbing the spread of CWD across North America.

Live-Animal Test

Many approaches have been described for preliminary detection of CWD infection antemortem, including IHC of either tonsilar or rectal lymphoid tissues; however, each of these has been found to have somewhat reduced sensitivity when compared with terminal obex or RLN IHC (47, 117, 138). Blood could be the optimal antemortem collection sample; however, several hurdles have overshadowed the detection of CWD prions in blood: (*a*) Little is yet known about the kinetics of prionemia in CWD-affected deer, which affects when, during the course of infection, blood sampling may be ideal or useful, and (*b*) while blood has proven to be a somewhat difficult sample type in the various amplification assays, recent successful results have been reported using RT-QuIC. The assay has also shown promise for use with saliva and urine samples from CWD-infected deer. More work will be needed applying these approaches in larger-scale, blinded studies with samples from cervids at various stages of infection (100, 139).

Feces, easily found throughout bedding and grazing areas frequented by cervid species, would be ideal for surveillance in areas where CWD incursion is a concern. This approach would also offer the benefit of precluding the need for physical contact with animals through sedation or restraint; indeed, fecal sampling could be done even during the seasonal absence of cervids in traditional grazing areas. A small number of studies have used fecal samples from elk with some success (99), although more work on this approach is certainly needed. Nasal brush samples have also shown limited success in the screening of free-ranging elk for CWD infection by RT-QuIC (N.J. Haley, unpublished data; 140). Brush samples have proven relatively simple to collect and process in both elk and farmed cervids, though, as with other antemortem samples, very little is known about the timing of PrP^d appearance in nasal epithelium, and diagnostic sensitivity and specificity are unknown without a large-scale, blinded study.

Strain Typing

With the further distribution of CWD across North America, and the increased frequency with which the disease is identified in captive herds, it is becoming increasingly important to develop a technique to strain-type CWD isolates. The two reported strains of CWD exhibit no overt biochemical differences, making conventional in vitro strain discrimination (e.g., molecular weight differences and glycosylation profiling) difficult, whereas the use of mouse bioassay techniques is both cost and time prohibitive (112). Several methods have been described recently for the in vitro discrimination of prion strains, though they have yet to be applied to CWD.

The first technique uses luminescent conjugated polymers, compounds that, when bound to PrP^d, emit a fluorescence spectrum that is dependent on prion conformation (141). This approach may successfully differentiate various families of TSEs, including BSE, scrapie, and CWD, but so far has not been used to evaluate different strains of CWD. In theory, these polymers could also be incorporated into the RT-QuIC assay, where their discriminatory capabilities may prove useful in differentiating CWD strains in real time. A second technique attempts to discriminate various TSE isolates by Fourier transform-infrared spectroscopy (FT-IR), which provides a PrP^d fingerprint based on the strength of hydrogen bonds and β-strand packing (142, 143). PrP^d could be prepared directly from CWD isolates or, if at very low levels in tissues, amplified in serial PMCA prior to FT-IR analysis. This approach has recently shown promise in discriminating natural and artificial strains of scrapie in hamsters (144) and could be applied to various isolates of CWD from captive and free-ranging cervids around the country.

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Vaccination

The development of an effective CWD vaccination strategy has been hindered by problems common to TSE vaccination—overcoming the natural barrier to antibody development against self-antigen and subsequently limiting the resulting immune response to the abnormal prion isoform. Despite these hurdles, several elegant approaches are in various stages of development for a vaccine against CWD infection. A recent vaccine trial used recombinantly produced segments of the cervid prion protein that had previously shown promise in a mouse model of scrapie (145). Following a prime-boost approach, vaccinated and control deer were naturally challenged via a CWD-contaminated environment. Although deer were found to successfully mount an immune response against the challenge peptides, both vaccinated and control deer eventually succumbed to infection, and the approach was considered unsuccessful.

A second and perhaps more promising approach, using an attenuated *Salmonella* vector expressing the cervid prion protein to generate a primary mucosal immune response, is currently under investigation (146). After oral vaccination and establishment of a detectable immune response, deer were boosted with an inoculation of polymerized, recombinant PrP at regional lymphoid sites (e.g., tonsil and rectal mucosa). Following oral challenge with a CWD-positive brain homogenate, vaccine and control deer were monitored by peripheral biopsy to assess CWD status. Interestingly, a greater proportion of vaccinated deer were reported to be asymptomatic (although the majority were biopsy positive) for CWD 24 months post-exposure, and the mean survival period for the vaccinated deer was significantly longer compared with the sham-vaccinated controls (145). Ultimately, all but one vaccinated and all control deer succumbed to infection. Thus, while intriguing and perhaps promising, more work is needed to explore this unconventional approach for the control of CWD and other prion diseases.

Environmental Clean-Up

The contamination of public wildlife areas, via excreta or decomposing carcasses, and the long-term quarantine of private cervid facilities where CWD has been found make the development and implementation of an effective clean-up regime imperative in both managing the spread of CWD and offering an alternative to farm depopulation and site condemnation. A concise review of the biotic and abiotic approaches to prion inactivation has been published recently, which summarizes nicely several techniques used to remove prions from contaminated environments, including microorganismal composting and protease treatment (106, 147, 148). More work in modeling and assessing the persistence of excreted CWD prions in the environment is needed to assess the risks and practical means for decontamination.

CONCLUSIONS

Much has been learned about CWD since its initial discovery nearly 50 years ago. Pathogenesis studies in both natural and experimental hosts have helped us to understand the centripetal trafficking of prions from the periphery to the central nervous system and the centrifugal dissemination to peripheral tissues, where it is ultimately shed in excreta. These studies have also allowed the recognition that multiple strains of CWD likely exist in nature, whereas epidemiological investigations and studies in similar prion diseases have led to the understanding that certain cervid genotypes may be more or less resistant to CWD infection. Additional work on the development of amplification-based detection assays has expanded our understanding of CWD pathogenesis and transmission, while offering the hope of a live animal test and the added potential of identifying prion strains in vitro. Much work remains to be done, however, with both

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effective vaccine and environmental decontamination strategies going a long way toward controlling the spread of CWD across North America.

DISCLOSURE STATEMENT

The authors are not aware of any affiliations, memberships, funding, or financial holdings that might be perceived as affecting the objectivity of this review.

ACKNOWLEDGMENTS

This work was partially supported by National Institutes of Health National Center for Research Resources K01OD010994. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.
The authors would like to take the time to thank all of those involved in the field of cervid health and production—from wildlife biologists and university researchers to members of the cervid farming industry and state and federal agricultural agencies—for their continued efforts and assistance in understanding and managing CWD.

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ALBERTA INNOVATES

2023–24 ANNUAL REPORT

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MESSAGE FROM OUR BOARD CHAIRPERSON

AS 2023 CAME TO A CLOSE, ALBERTA INNOVATES CELEBRATED THE SUCCESSFUL COMPLETION OF OUR FIVE-YEAR STRATEGIC PLAN. IN REFLECTING ON THE ACCOMPLISHMENTS OF THE PREVIOUS FIVE YEARS AND LOOKING TO THE NEEDS OF THE ORGANIZATION IN THE COMING YEARS, THE BOARD DETERMINED IT WAS TIME TO MOVE IN A BOLD, NEW DIRECTION WITH A SHARPENED FOCUS ON NOT JUST INNOVATION BUT ALSO PRODUCTIVITY AND TECHNOLOGY.

Tony Williams

We've also made a commitment to fostering strong collaboration with our partners who have emerged in the innovation, technology, and productivity ecosystem. This renewed focus will enhance our ability to support Alberta's growth and development.

As the board chair, I was pleased in June 2024 to appoint Dr. Michael Mahon as Interim CEO to guide Alberta Innovates for the next year. Dr. Mahon is a globally acknowledged leader and researcher, and we are fortunate to have recruited someone of his caliber while we look for a new permanent CEO over the coming year.

I want to thank former CEO Laura Kilcrease for her hard work and commitment over the last seven years, particularly in seeing through the implementation of the five-year strategic plan that took us to the end of 2023.

Alberta Innovates plays an important role in advancing research and innovation in our province, and our board is also evolving. I would like to welcome the following new directors:

- Vice Chair, **Dr. Jodi Abbott** C.M. ICD.D
- **Brad Severin** FCPA FCA CFP TEP
- **Robert Fernandez**
- **Richard Wong**

I extend my thanks to past Board Chair, Brenda Kenny, for her dedicated service and significant contributions to Alberta Innovates as well as departing members: Dr. Tom Thompson, Dr. Anne Snowdon, Alison Jackson, Chelsey Reschke, Rod Schatz, and Ruth McHugh.

Alberta Innovates is privileged to have many key partners in the innovation and technology sector in this province. Many of these partners are new in the last five years and need to be better considered in our next phase of planning. Inventures, Alberta Innovates' signature event, will provide one excellent opportunity to improve collaboration and further grow those partnerships.

This is a transformative time for Alberta Innovates. Building on Alberta's strengths, we will focus our future work on enhancing productivity and technology. Our board is excited to move the organization and the work employees do with its many partners in the research and innovation sector forward.

With so much exciting, new work ahead of us, it's also important to reflect on the significant accomplishments that have led us to this point. With that in mind, I am pleased to provide this 2023-24 Annual Report as a showcase of our work with Albertans across all stages of the entrepreneurial and innovation journey.

LAND ACKNOWLEDGEMENT

WE ACKNOWLEDGE THE MANY FIRST NATIONS, MÉTIS AND INUIT WHO HAVE LIVED ON AND CARED FOR THESE LANDS FOR GENERATIONS. WE ARE GRATEFUL FOR THE TRADITIONAL KNOWLEDGE KEEPERS AND ELDERS WHO ARE STILL WITH US TODAY AND THOSE WHO HAVE GONE BEFORE US.

ALBERTA INNOVATES RESPECTFULLY ACKNOWLEDGES WE ARE SITUATED ON TRADITIONAL TERRITORY OF THE TREATY 6, TREATY 7 AND TREATY 8 FIRST NATIONS; HOME TO THE MÉTIS SETTLEMENTS, THE MÉTIS NATION OF ALBERTA AND REGIONS 2, 3 AND 4 WITHIN THE HISTORICAL NORTHWEST MÉTIS HOMELAND.

WE RESPECT THE HISTORIES, LANGUAGES AND CULTURES OF FIRST NATIONS, MÉTIS AND INUIT WHOSE PRESENCE CONTINUES TO ENRICH OUR VIBRANT COMMUNITY.

ACCOUNTABILITY STATEMENT

The Alberta Innovates Annual Report for the year ended March 31, 2024, was prepared under the Board's discretion in accordance with the Alberta Research and Innovation Regulation, and the ministerial guidelines established pursuant to the *Alberta Public Agencies Governance Act (APAGA)* and the *Sustainable Fiscal Planning and Reporting Act*. All material economic, environmental or fiscal implications, of which we are aware, have been considered in preparation of this report.

Original signed by Tony Williams

Chairperson

May 24, 2024

Date of Approval of Financial Statements

EXECUTIVE SUMMARY

THE ALBERTA AND NATIONAL ECONOMIES SUFFERED BUMPS AND BRUISES LAST YEAR, PARTLY DUE TO PERSISTENT INFLATION AND TIGHT MONETARY POLICY CAUSING PAIN FOR BUSINESSES AND HOUSEHOLDS. PROVINCIAL GDP GREW AT A SIGNIFICANTLY SLOWER PACE IN 2023 COMPARED TO THE YEAR BEFORE, AT 2.5 PER CENT VERSUS FIVE PER CENT GROWTH IN 2022.

Businesses and households felt the pain as they renewed loans at higher interest rates and venture capital (VC) investments within Canada dropped by 45 per cent in 2023. Despite this, Alberta was able to largely maintain the momentum it had gained over the last two years, with VC investment in the province declining by a relatively modest eight per cent but still seeing $707 million in VC investments across 86 deals in 2023.

Against this backdrop of economic turbulence and national concerns about declining productivity, Alberta Innovates stayed the course in 2023–24 with programming aligned to its areas of significant economic opportunity and provincial priorities, including the Alberta Technology and Innovation Strategy (ATIS). Our activities were based on our long-term view of provincial needs and opportunities, along with our assessment of how and where research and innovation (R&I) can help Alberta weather short and medium-term ups and downs and address global challenges.

Highlights

The launch of the Hydrogen Centre of Excellence (HCOE) resulted in significant activity for Alberta Innovates and our subsidiaries, C-FER Technologies and InnoTech Alberta. Of the overall $50 million revenue grant provided to Alberta Innovates from the Government of Alberta, we invested $9.9 million in funding to support hydrogen-related projects.

Through support of the HCOE, C-FER and InnoTech invested in capital projects to build necessary infrastructure to support the growth of Alberta's hydrogen economy. Additional funding for these projects was received from partners such as Prairies Economic Development Canada (PrairiesCan).

Our subsidiaries continue work with industry to support the need to accelerate clean energy systems in Alberta and beyond to meet net zero goals. Among other things, our services and facilities will enable industry to:

- Develop and test the infrastructure, equipment and technologies required to bring hydrogen into widespread use as lower-carbon fuel.
- De-risk production of carbon fibre made from bitumen, so Alberta's vast oil sands reserves can provide a feedstock for the manufacture of this highly useful industrial material, lower downstream emissions and create enormous new economic opportunities.
- Explore using geothermal energy from beneath the Earth's surface as an alternate energy source for industrial heat and power applications.
- Convert raw biomass into components that can be used to manufacture biofuels, biochemicals and other renewable, bio-based products.

InnoTech's work with multiple partners led the province to adopt alternative reclamation and certification processes for certain types of well-sites. Reclamation costs will be reduced while achieving equal or better environmental outcomes.

C-FER continued to apply machine learning and artificial intelligence to help Canadian and global pipeline operators better understand current and projected future conditions of their pipeline networks. This work helps to inform decisions about improved safe pipeline operation, maintenance and repair.

We strengthened the innovation ecosystem **across all sectors** through our entrepreneurial programs and services, ecosystem development program and our accelerator program:

- We continued to fund five accelerators with our partners in the Scaleup and Growth Accelerator Program (Scaleup GAP) to provide end-to-end business support services for growth-oriented companies. The accelerators graduated 325 companies which in turn attracted $282 million in new investment – an increase of $134.5 million since last year – and generated more than $58 million in new revenue.
- The Alberta Innovates-funded Regional Innovation Networks (RINs) across Alberta provided support services to 1,231 unique companies in 2023–24. RINs also reported 211 new companies being formed/incorporated in their regions during the same period.

The Accelerating Innovations into CarE (AICE) suite of programs supported innovators to advance health technologies into care with the aim of maximizing economic and health impacts for Alberta. In 2023–24, the programs invested $10 million in projects and companies supported through AICE programs raised nearly $14 million in additional private investment.

In 2023–24, we launched two challenges in the Digital4Health (D4H) program to grow collaborations between health service delivery partners and digital health tech solution providers. We partnered with Alberta Blue Cross for D4H's first challenge, focused on using health technologies to address various workplace and wellness challenges such as chronic disease and obesity. The second challenge, in collaboration with the Glenrose Rehabilitation Hospital Foundation, was designed to explore and test innovative solutions for equitable access to rehabilitation care in remote and rural Alberta communities.

We continued to build a bridge between research and the marketplace through programs like Campus Alberta Small Business Engagement by connecting academic experts with Alberta small- and medium-sized enterprises (SMEs). We also invested in R&D for emerging technologies like quantum.

In our agriculture portfolio, we provided grant funding either directly in agri-food innovation and chronic wasting disease projects, or for livestock and crop research through our membership in the Agriculture Funding Consortium comprised of farmer organizations, government and funders.

Our signature annual event – Inventures – brings together investors, policymakers and innovators to spark creative collisions and deal-making. A critical means through which Alberta Innovates accelerates innovation in the province, Inventures 2023 continued its post-pandemic climb in participation, attracting 3,100 attendees from 32 countries. We featured 298 speakers, had 42 participants in pitch competitions and reached a broader audience of viewers with a combined 638 hours of Inventures Unbound Live Stream programming. Inventures saw $139 million to $256 million in business carried out, negotiated or begun at the conference and it created $2.5 million in economic activity.

We encourage you to explore our annual report in more detail to learn about our investments and impacts in 2023–24.

CONTEXT AND OUTLOOK

THE 2023–24 FISCAL YEAR IN ALBERTA AND ACROSS CANADA WAS DOMINATED BY NATIONAL CONCERNS OF INFLATION, RISING INTEREST RATES, DECLINING PRODUCTIVITY AND COST OF LIVING PRESSURES ON CANADIANS.

Despite these national pressures, Alberta's economy grew, although at a reduced rate from the year before and more in line with historical averages. Real GDP growth was estimated at 2.5 per cent, down from five per cent in 2022, according to the Government of Alberta Fiscal Plan. Fueling Alberta's growth was a continued population boom. Government statistics show Alberta grew by more than 200,000 people, a 4.4 per cent increase and the highest growth rate in Canada. Most of this growth came from international migration as well as significant inter-provincial migration into Alberta.

Showcasing the value of innovation must remain a priority against this conflicting backdrop of rising growth and rising costs. In health care, as an example, simply providing unlimited funding will not make the system more effective or efficient. Innovation is needed to find new ways to address historic challenges faster, smarter and more efficiently.

With that in mind, Alberta is well positioned. After record venture capital (VC) investment in 2022, Alberta again had a strong year as it saw $707 million invested across 86 deals in 2023. Investments in other provinces declined considerably compared to 2022. But Alberta maintained the momentum it had gained over the last two years, with VC investment declining by only eight per cent, compared to a national drop of about 45 per cent.

Looking ahead, Alberta's population growth is expected to continue. Nationally, the Bank of Canada is anticipated to begin reducing interest rates in 2024. The completion of the Trans Mountain pipeline expansion project in the spring of 2024 will allow more of Alberta's landlocked resources to be transported to tidewater. This will require ongoing energy diversification and technologies that can reduce emissions and develop new products from our oil and gas resources.

Drought, wildfires, floods and other adverse weather events at home and around the world will continue to affect society's capacity to respond to both the human and financial cost of these emergencies. It also emphasizes the need to develop strategies and practices to mitigate and adapt to climate change and protect land and water resources.

Global food security will increasingly be challenged by population growth and weather. It will require ongoing investment and innovation in smart agriculture to increase yields and production while reducing economic and environmental costs.

Containing health care while improving patient access and outcomes will continue to challenge service providers and governments here and elsewhere. Using health data and technology can help to address these pressing needs.

Alberta Innovates has supported the development and adoption of artificial intelligence (AI) in Alberta for more than two decades and provides funding to the internationally renowned Alberta Machine Intelligence Institute (Amii), one of Canada's three centres of excellence that form the Pan-Canadian AI Strategy. Amii's principal investigators are world leaders in several sub-fields of machine learning and AI.

They work closely with global scientific and business communities to push the bounds of knowledge. These technologies continue to be a strategic priority for investment by Alberta Innovates. While there are tremendous opportunities – economic and otherwise – Canadians remain skeptical and many do not trust the technology at a base level. Proponents of artificial intelligence counter public unease by emphasizing the power of this transformative technology to solve the greatest challenges facing humankind and the planet.

Alberta Innovates and its partners remain committed to transparency and to building trust to highlight how innovation and technology are making a positive difference.

Science and innovation have the potential to create a better tomorrow. The ideas and science being pioneered today will lead to tomorrow's opportunities. Alberta Innovates and its subsidiaries have addressed the challenges identified above and the opportunities, through strategic initiatives, programs and services. We will continue to be responsive to market pull and we will continue to anticipate future challenges that will need solutions.

RESULTS AND ACHIEVEMENTS

INNOVATION IS THE CATALYST FOR ECONOMIC STRENGTH, JOB CREATION, IMPROVED HEALTH AND WELL-BEING AND ENVIRONMENTAL SUSTAINABILITY. AS ALBERTA'S ONLY CROSS-SECTORAL RESEARCH AND INNOVATION (R&I) AGENCY, ALBERTA INNOVATES IS UNIQUELY POSITIONED TO TRANSFORM GREAT IDEAS INTO SCALABLE SOLUTIONS THAT IMPROVE THE LIVES OF ALBERTANS.

This annual report highlights the results and achievements related to the key initiatives and activities presented in our 2023–26 Business Plan. The results show many of the ways our strategic actions have contributed to our corporate goals and our organizational mandate as set by the Government of Alberta.

Cascaded and interconnected relationships exist between the R&I priorities of the Government of Alberta and our corporate priorities, goals and business and operating plans. This ensures the positive impact we create for Albertans aligns with government priorities and strategies, including those in the Investment and Growth Strategy and the Alberta Technology and Innovation Strategy (ATIS).

Alberta Innovates leverages a variety of enterprise-level systems to gather information including finance and administrative data and complements this through other tools that collect additional evidence about the progress, outcomes and impacts. We use two important tools to gather information annually from our clients, about the achievements they made through our investments. These tools are the Post-Investment Report and the Annual Outcomes Report. The Post-Investment Report collects information from small- and medium-sized enterprises (SMEs) that completed funding between 2019 and 2023 and follows each SME annually for a five-year period. Results from this survey include key performance indicators (KPIs) such as the number of new hires (jobs) in Alberta from our R&I investments in SMEs and the amount of revenue generated.

The 753 responses received for this report represent a response rate of 77 per cent.

Information from researchers, and other non-SME clients who held research grants with Alberta Innovates during the 2023–24 period is collected through the Annual Outcomes Report. KPIs include measures such as the number of people supported through our investments. The response rate was 94 per cent, with 463 reports completed by clients.

Client satisfaction is gathered on application forms, and through the Post-Investment Report and the Annual Outcomes Report.

The methods, sources and tools used for the KPIs reported in the annual report are described in detail in the Alberta Innovates 2023–26 Business Plan Indicator Data Codebook. The codebook is available upon request by emailing pme@albertainnovates.ca.

Individual programs are designed with specific objectives based on the need that the program was developed to address. Program objectives may therefore focus on a specific aspect of the R&I continuum or within a specific sector, rather than extending across the continuum from Discover to Use or being sector-agnostic. As such, each corporate goal and its associated objectives and KPIs may not be relevant or equally relevant to individual programs or services provided by Alberta Innovates.

The following pages in this section of the report summarize Alberta Innovates' achievements in 2023–24 for each corporate goal and its objectives. Our performance for each KPI is compared to the target presented in our 2023–26 Business Plan. ***Actuals within 10 per cent of the target are considered as being "on target." The far-right column provides a visual representation of performance relative to target. A bullseye symbol indicates performance was "on target" and arrows pointing up or down represent a variance more than 10 per cent above or below target, respectively.*** Insights for results that were not on target are provided immediately below each table.

Key program and client highlights achieved throughout the year are provided below the results table for each corporate goal. These highlights may demonstrate additional achievements beyond those reflected in the KPIs. We also encourage you to explore the many other notable successes achieved by our clients and our organization over the past year as shared through news and stories on our website and YouTube channel, by listening to our SHIFT podcast and checking us out on social media.

THE R&I CONTINUUM

Discover *– aims to create new knowledge or understanding that may or may not have specific applications in mind from the outset. This type of research is usually performed at universities.*

Develop *– involves developing knowledge gained during the Discover stage toward a particular use. This development work typically occurs in applied research areas at universities, colleges and polytechnics, as well as industrial research laboratories.*

Use *– is about translating and applying developed research to address needs in the 'real-world.' This activity focuses on processes for the uptake, spread and scale of application-ready innovations. Examples include technology adaptation, technology commercialization, product and market innovation, and translational research in health care.*

GOAL 1

RESEARCH & INNOVATION IS STIMULATED IN AREAS OF STRATEGIC IMPORTANCE BY INVESTMENTS IN PROGRAMS, SUPPORTS AND SERVICES.

Objective	KPIs	Baseline (Actuals 2020–21)	Actuals 2021–22	Actuals 2022–23	Target 2023–24	Actual 2023–24	Performance to Target#
1.1 Strategically invest in research & innovation that aim to benefit Alberta.	**1.1.1** $ invested in areas of research, innovation and commercialization	$153.3M	$156M	$156M	$161M	$155M	◎
	1.1.2 # of clients supported through grant investments (excluding trainees)	n/a*	974	976	≥970	998	◎
	1.1.3 Projected annual GHG emission reduction (Mt $C0_2e$) by 2030 by all completed and active projects	17Mt	18Mt	18Mt	21Mt	21Mt	◎
1.2 Support SMEs to develop and commercialize innovations.	**1.2.1** # of new hires (jobs) in Alberta in SMEs funded by Alberta Innovates	2,460	3,197	5,709	3,100	4,522	↑
	1.2.2 % difference in year-over-year job growth for SMEs funded by Alberta Innovates, compared with all Alberta companies	11.7%	4.9%	12.6%	≥10%	-3%	↓
	1.2.3 % difference in survival rate for SMEs funded by Alberta Innovates, compared with Canadian SMEs after 6 years	28.8%	27.6%	27.4%	≥25%	24.7%	◎
	1.2.4 % difference in revenue- generating SMEs funded by Alberta Innovates that export, compared with all Alberta companies that export	44.5%	52.5%	54.5%	≥40%	46.2%	◎

GOAL 1 (CONTINUED)

Objective	KPIs	Baseline (Actuals 2020–21)	Actuals 2021–22	Actuals 2022–23	Target 2023–24	Actual 2023–24	Performance to Target#
1.3 Enhance Alberta's research and innovation system by providing expertise and supporting capacity development	**1.3.1** # of clients supported through in-kind supports and services	n/a	4,162**	4,374	≥4,200	7,649	◎
	1.3.2 # of trainees supported to enhance the knowledge workforce in strategic areas	n/a*	1,574	1,887	≥1,650	3,271, with 659 receiving direct support from Alberta Innovates***	◎
	1.3.3 # new research studies submitted to Health Research Ethics Boards of Alberta (HREBA) to safeguard the rights and welfare of individuals volunteering to participate in research	559	621	461	630	521ǂ	↓

 # A bullseye symbol indicates performance was "on target" and arrows pointing up or down represent a variance more than 10 per cent above or below target, respectively.

** 2021–22 was baseline year for data capture given the change in methodology for people supported KPIs*

*** 2021–22 was baseline year for data capture.*

**** The number of trainees directly supported through Alberta Innovates funding are validated through our systems as unique counts; those supported indirectly through Alberta Innovates investments in other R&I activity, e.g., participation in research labs and or projects of funded researchers, are more difficult to validate and may reflect double-counting in some instances.*

ǂ Due to delays in data from the University of Calgary, actuals from April 1, 2023, to December 31, 2023, were supplemented with an estimate of submissions for January 2024 to March 2024. The estimate was based on activity in the same period in previous years.

Variance to Target

1.2.1 and 1.2.2 – The SMEs in our Post-Investment Report vary annually as those 5-years post-funding are no longer included and new SMEs are added. Changes in the report's population and sample size partially account for some of the variation observed in the KPI results. For example, approximately 30 fewer SMEs were included in the 2023–24 report compared to the prior year, and the response rate was slightly lower. In addition, the SMEs that dropped from the 2023–24 sample because they were past the five-year report period, had created 1500 new jobs, which accounts for much of the variance compared to the 2022–23 actuals (a banner year for the new job count numbers, and an anomaly when comparing the KPI results over time). Conversely, while new SMEs were added to the 2023–24 report and contributed to the job count number, they did so at lower volume then companies that had dropped out of the report. The KPI variance in 2023–24 is also consistent with trends identified by Statistics Canada[1], where SMEs in 2023 were more likely to expect a decrease in revenue and less likely to hire new employees.

1.3.3 – The number of new research studies submitted to HREBA in 2023–24 was below target due primarily to the delays in the opening of the Calgary Cancer Centre.

Highlights

The Hydrogen Centre of Excellence (HCOE) is a major energy initiative led by Alberta Innovates, with the applied research and engineering expertise of our two subsidiaries, C-FER and InnoTech. The centre is a funding program, testing and service facility, and forum to drive the development and use of hydrogen in Alberta. The HCOE has spurred significant activity for Alberta Innovates, C-FER and InnoTech. As part of the overall $50 million revenue grant provided to Alberta Innovates from the Government of Alberta, we invested $9.9 million in grant funding in 2023–24 to support hydrogen-related projects that range from bench-scale, proof-of-concept through to small field pilots. Multi-year commitments to the centre by the Government of Alberta and Alberta Innovates stimulated additional hydrogen funding. Natural Resources Canada committed $15 million of federal funding directly to HCOE projects in Alberta over several years, and Emissions Reduction Alberta (ERA) announced their own $25 million Hydrogen Challenge.

The Accelerating Innovations into CarE (AICE) suite of programs support innovators to advance health technologies into care with the aim of maximizing economic and health impacts for Alberta. In 2023–24, the suite of programs invested $10 million in projects, and companies funded by us raised nearly $14 million in additional private investment. Multi-year investments in AICE projects approved in previous years had client successes in 2023–24, including innovative technologies for patient use (e.g., cardiac monitors, enhanced oxygen delivery and use of virtual reality to transform eye exams) and making new products available to Albertans and industry (e.g., an application that uses artificial intelligence for dental practice, an enhanced prostate cancer screening test, and a new low-radiation imaging device for breast cancer).

Partnership for Research and Innovation in the Health System (PRIHS) launched its eighth cycle in April 2023. In collaboration with Alberta Health Services, this program is intended to bring value to patients, providers and partners within the system. In 2023–24, $6.2 million in funding was provided to projects, including four multi-year initiatives leveraging digital health solutions to address health system challenges and develop new models of care.

In November 2023, Alberta Innovates rebranded the ImplementAB.digHealth program and launched the Digital4Health (D4H) program to focus on health and wellness priorities within the province. The program encourages collaborations between health service delivery partners and digital health tech solution providers for pilot-testing, evaluation and adoption of technology-enabled care. We partnered with Alberta Blue Cross for D4H's first challenge – using health technologies to address various workplace and wellness challenges such as chronic disease and obesity. We launched a second challenge in February 2024 in partnership with the Glenrose Rehabilitation Hospital Foundation, to explore and test innovative solutions for equitable access to rehabilitation care in remote and rural Alberta communities.

[1] *(Source: Statistics Canada. (2023). Canadian Survey on Business Conditions, first quarter of 2023.)*

LevMax Synergy (2.0) aims to advance digital health research and innovation in Alberta to improve health outcomes, maximize economic benefits and support clients. Through a collaboration with the federal Tri-Agencies[2], the program enables us to leverage the Tri-Agencies peer-reviewed process to efficiently identify nationally competitive health research projects at Alberta post-secondary institutions, thus reducing resource requirements within our organization. The program received 25 applications in June 2023 – an increase of 24 per cent compared to previous cycle – and spent $4.7 million to fund projects in 2023–24.

We continue to develop and grow Alberta's R&I talent pool in artificial intelligence, digital health and other emerging technology areas through initiatives such as our Graduate Student Scholarships, Postdoctoral Fellowship, Industry Commercialization Associates, Industry r&D Associates, High School Youth Research Summer (HYRS), Summer Research Studentships (SRS) and +1 Option (pilot) programs. Some key highlights in 2023–24 include:

- The Associates programs created 134 new jobs with employee retention rates between 71 and 80 per cent.
- 367 students received emerging technology scholarships through the Graduate Student Scholarships program.
- 26 Postdoctoral Fellowships were awarded for work in data-driven health research and technology acceleration, including 17 prestigious recruitment fellowships that increase the competitiveness of Alberta as a destination for digital health innovation.
- HYRS and SRS provided 249 students with paid experiential learning opportunities at the intersection of health and emerging technology in the summer of 2023. These programs have been expanded at Alberta's undergraduate universities, polytechnic institutions, community colleges and comprehensive research universities. Other students will benefit from these opportunities in the summers of 2024 and 2025 through our total investment of $4.6 million to 10 post-secondary institutions.

Launched in August 2023, the Digital Health Sandbox initiative invests in Alberta SME-led innovation projects. More than $1.3 million was invested in 2023–24 into six three-year projects in the startup phase.

In 2023–24, A pRoject Ethics Consensus Community Initiative (ARECCI) received 2,688 project submissions through its Ethics Screening and Ethics Guidelines decision-making tools. These tools had 1,926 unique users worldwide during the same period. This reflects nearly a 22 per cent increase in usage and a 15 per cent increase in unique users over the previous year.

Alberta Innovates celebrates the success of a made-in-Alberta life sciences company, Nanostics Inc.

Nanostics recently launched the ClarityDX Prostate Test in Alberta. This innovative blood test marks a significant advancement in prostate cancer screening. Alberta Innovates is proud to have supported Dr. John Lewis and this company for nearly 10 years through our Industry r&D Associates and AICE-Market Access programs as well as others.

[2] *Canadian Institutes of Health Research; Natural Sciences and Engineering Research Council; Social Sciences and Humanities Research Council.*

InnoTech invested a total of $7 million through its Strategic Investment Grant into industrial technology areas of strategic importance including: Bitumen Beyond Combustion; carbon capture, utilization and decarbonization; hydrogen technologies; clean technologies; applied data sciences; circular economy; and land and nature-based solutions.

Regional Innovation Networks (RINs) provided services to 1,231 unique companies in 2023–24 and gained 1,072 new entrepreneur and/or company clients. RINs also reported 211 new companies being formed/incorporated in their regions during the same period.

Our Technology Development Advisors (TDAs) provided senior-level coaching and advisory services to high-potential, high-growth technology or innovation companies with more than 1,430 clients across the province, including 540 new clients. TDAs also provided in-kind support to RIN partner organizations to assist with RIN clients and initiatives.

Leveraging the Ecosystem Development Partnerships (EDP) program and supporting the objectives of our Capital Access program, we invested in activities to provide clients with increased access to capital, elevated their investment readiness, educated and activated early-stage investors, and drove the deployment of private capital into Alberta Innovates client companies. This included funding for two investment summits hosted by Startup TNT. Eighty qualified companies pitched at these events and $1.13 million was invested by 110 angel investors in 12 Alberta companies. Of the companies funded, 68 per cent were companies identifying as Black, Indigenous and people of colour (BIPOC) and 24 per cent were founded by females. For every $1 invested by Alberta Innovates into the summits, Alberta companies attracted $4.54 in angel capital.

We funded five accelerators with our partners in the Scaleup and Growth Accelerator Program (Scaleup GAP) to provide end-to-end business support services for growth-oriented companies. The accelerators graduated 325 companies which in turn attracted $282 million in new investment – an increase of $134.5 million since last year – and generated more than $58 million in new revenue. Nearly half was new export revenue.

RINs are highly regarded innovation organizations in rural and urban communities across the Alberta. They are seen as a part of the Alberta-advantage for companies in the province. We fund them to provide services and supports to help local tech and knowledge-based businesses innovate and grow. The RINs have provided support to over 9,525 companies since 2015, helping to diversify regional economies and build a strong entrepreneurial culture in Alberta.

Powered by Alberta Innovates, the Rural Women's Entrepreneurs in Tech (RWEIT) supports rural women technology entrepreneurs across the province. The RWEIT builds collaborative partnerships with the RINs and other ecosystem service providers in Alberta to ensure equitable access to support for self-identified women and non-binary entrepreneurs. The team bridges gaps for rural clients while connecting them with Alberta's innovation ecosystem through workshops and one-on-one coaching with an Entrepreneur Ecosystem Navigator. All with the intent to increase the number of underrepresented women entrepreneurs in technology.

We invested $4.2 million in grant funding into agri-food innovation projects in areas such as:

- Chronic wasting disease, a highly contagious neurodegenerative prion disease in the deer family which poses risks to Alberta's agricultural sector and threatens a sustainable food source for Indigenous communities and our export markets.
- Agriculture research projects in livestock and crops through the Agriculture Funding Consortium. The Consortium includes farmer organizations, governments and funders working collaboratively to receive applications and (co-)fund research that supports sustainability, diversification and long-term growth for agriculture and the food industry across the Prairies.
- Projects featuring robust partnerships between post-secondary institutions and private industry to address various aspects of the agri-food value chain and explore new technologies and processes that enhance sector productivity.

Our support of emerging technology-based R&D projects through the NSERC Alliance – Alberta Innovates Advance (Advance) program contributed to the formation of three spin-off companies in the areas of quantum, smart thermal and membrane manufacturing technologies.

Alberta Innovates helped catalyze academic-industry partnerships that support the growth of Alberta SMEs through programs such as Advance and Campus Alberta Small Business Engagement. These programs provided funding support to 67 new clients who were SMEs or researchers.

The Health Research Ethics Board of Alberta (HREBA) hosted by Alberta Innovates provided support to more than 3,000 research staff across the province and 2,170 active trials (includes both new and ongoing trials). The Board also provided support to patients and families with inquiries related to research projects approved through its committees.

With co-funding from Alberta Innovates, BioIndustrial Innovation Canada and Prairies Economic Development Canada (PrairiesCan), researchers at the University of Alberta are working with industry partners – including Davy Textile Solutions, Mark's, Techfibre Industries and Plantae Technologies – to convert hemp into an environmentally friendly fibre that can be used in everything from dental floss to workwear. As there is currently no domestic supply of filament or staple fibre in Canada, the implementation of this project is expected to make a significant contribution to the Canadian textile industry and provide additional opportunities for relevant sectors throughout the supply chain.

Mojow Autonomous Solutions Inc. is developing an artificial intelligence data recording kit called the EYEBOX™, which, when incorporated into farming equipment, enables automated data collection and operation. With Alberta Innovates funding, the team developed and tested path-planning software capable of efficiently covering an entire farm field, ensuring no gaps and minimal overlap. After receiving support from Alberta Innovates, Mojow Autonomous Solutions Inc. was able to secure additional funding from the Canadian Agri-food Automation and Intelligence Network (CAAIN) to continue development of the technology.

[3] *Canadian-made, environmentally-friendly fibres could boost textile manufacturing | Folio (ualberta.ca)*

GOAL 2

APPLIED RESEARCH, DEVELOPMENT AND ENGINEERING SERVICES ARE PROVIDED THAT VALIDATE, TEST AND TRANSLATE INNOVATION INTO REAL-WORLD USE.

Objective	KPIs	Baseline (Actuals 2020–21)	Actuals 2021–22	Actuals 2022–23	Target 2023–24	Actual 2023–24	Performance to Target#
2.1 Increase proportion of revenue generated by InnoTech and C-FER from sources other than Government of Alberta	**2.1.1** % increase in revenue generated by InnoTech and C-FER from sources other than Government of Alberta	n/a*	-1%	8.9%	2.4%	1.5%	↓
2.2 Optimize use of InnoTech and C-FER resources.	**2.2.1** % of InnoTech capacity utilized to enhance and provide the delivery of services to clients (effective utilization)	76%	76.5%	82.3%	75-80%	82.2%	◎
	2.2.2 % of C-FER capacity utilized to provide the delivery of services to clients (effective utilization)**	ǂ	ǂ	29.30%	ǂ	27%	◎
2.3 Leverage partner relationships and funding to advance technology development in Alberta.	**2.3.1** $ (external) leveraged for each $1 invested by InnoTech	$6.81	$4.78	$4.29	$4.10	$4.01	◎
	2.3.2 $ leveraged for InnoTech's growth focus areas** for each $1 invested by InnoTech	n/a***	$0.54	$0.74	≥$0.5	$0.77	◎
	2.3.3 $ leveraged for InnoTech's core areas for each $1 invested by InnoTechᵝ	n/a***	$5.79	$5.04	≥$2.5	$4.63	◎

 # A bullseye symbol indicates performance was "on target" and arrows pointing up or down represent a variance more than 10 per cent above or below target, respectively.

** The methodology for this KPI was revised since the 2023-26 Business Plan to reflect year-over-year (incremental) revenue growth within our subsidiaries from non-Government of Alberta sources. This better conveys our priority of attracting higher non-GOA revenue year-over-year as compared to the previous methodology of using a static baseline ($38.1 M in 2020-21) when calculating annual revenue growth.*

*** Objective 2.2 had a single KPI in Business Plan 2023-26 that aimed to report the combined results for our two subsidiaries. However, the use of different methodologies for calculating effective utilization within each organization required two KPIs to be used within this report. Specifically, InnoTech measures effective utilization as the "percentage of time staff are spending on billable projects, business development, or operations and maintenance activities" and C-FER's measure reflects the "percentage of time staff are spending on billable projects".*

ǂ 2022–23 will be baseline year for data capture. Targets have been set for 2024-25, 2025-26, 2026-27 in the Alberta Innovates 2024-27 Business Plan.

**** 2021-22 was baseline year for data capture.*

ᵝ For 2.3.3, an oversight was identified in the data calculation used in the 2023-26 Business Plan which led to an erroneously reported value of $2.5. This was subsequently corrected to $5.79 using the appropriate methodology.

GOAL 2 (CONTINUED)

Objective	KPIs	Baseline (Actuals 2020–21)	Actuals 2021–22	Actuals 2022–23	Target 2023–24	Actual 2023–24	Performance to Target#
2.4 Transition technologies and products to market through our applied R&D expertise and services.	**2.4.1** # of jobs created by clients accessing InnoTech's applied R&D services	288	312	318	≥300	329	◎
	2.4.2 Advancement of InnoTech-supported technologies along Technology Readiness Levels	1.5 levels	1.5 levels	1.9 levels	≥1.5 levels	1.5 levels≠	◎
	2.4.3 GDP impacts resulting from InnoTech-supported advancement of technologies, products, processes, job creation or maintenance	$818M	$794M	$805M	$750–850M	$828M	◎

≠ Estimated advancement in Technology Readiness Levels since not assessed every fiscal.

Variance to Target

2.1.1 – Year-over-year non-Government of Alberta revenue growth was highest in 2022–23 primarily due to recovering from reduced business activities and economic factors due to COVID. While non-Government of Alberta revenues grew an additional 1.5 per cent in 2023–24 compared to 2022–23, this was slightly below the target.

Highlights

Alberta Innovates provided $4 million in capital funding to C-FER and InnoTech to build necessary infrastructure to advance Alberta's hydrogen economy. These facilities enable Alberta Innovates to respond to opportunities that support the growth of the hydrogen economy.

- InnoTech completed two capital projects for the Hydrogen Centre of Excellence (HCOE), namely the High Temperature Testing Lab for testing hydrogen production process technologies and the Carbon, Catalyst and Solid Sorbent Characterization Lab for preparing and analyzing materials used in hydrogen projection. InnoTech is also on track for opening the Hydrogen Quality Centre in 2024 which will provide accredited hydrogen testing services to ensure hydrogen quality meets requirements for intended end-users.
- C-FER received an additional $1.8 million from Prairies Economic Development Canada (PrairiesCan) in 2023–24 to establish a unique facility for testing hydrogen infrastructure, equipment and technologies. More than $8 million in research projects with 13 Canadian and international organizations is also supported by C-FER and HCOE funding.
- C-FER developed concepts for the safe transportation of compressed hydrogen to international markets.
- C-FER developed new products for evaluating and constructing wells for suitable underground storage of hydrogen.

- C-FER performed work in areas such as hydrogen transmission, natural gas and hydrogen underground storage, and pipeline integrity for large industry groups.

C-FER continued to apply machine learning and artificial intelligence to help Canadian and global pipeline operators better understand current and projected future conditions of their pipeline networks. This work helps to inform decisions about improved safe pipeline operation, maintenance and repair.

InnoTech completed installation of a Pressure Reaction Tower to fill a key gap in derisking pre-commercial-scale fibre processing technologies before new manufacturing facilities can be built to produce bio-based products at industrial scale in Alberta. The tower is a continuous chemical extraction system for converting lignocellulosic biomass into pulp, sugars (for biofuels and biochemicals), resins and polymers.

C-FER leverages joint industry initiatives to add value in areas such as pipeline leak detection, wellbore integrity and electrical submersible pump reliability. For example, the joint industry initiative evaluating the reliability of electrical submersible pumps has been providing valuable input to a group of more than 20 operators for over 26 years.

A five-year project led by InnoTech, delivered with the help of numerous partners, resulted in the Alberta Ministry of Environment and Protected Areas issuing an Interim Directive that allows for alternative reclamation and certification processes for certain types of well-sites. This will reduce reclamation costs while achieving equal or better environmental outcomes.

InnoTech completed two key experiments to support the warm dimethyl ether recovery process (patent pending). This process, which can be deployed in existing operations or new facilities, has the potential to reduce GHG emissions by up to 86 per cent and reduce water consumption by up to 79 per cent compared to traditional steam-assisted gravity drainage bitumen extraction.

C-FER continued to support clean energy transformation by working with Canadian companies to assess the feasibility of novel geothermal energy recovery schemes for industrial heat and power applications. C-FER performed other work related to the long-term storage of nuclear waste.

Companies continued to use facilities at the Alberta Carbon Conversion Technology Centre (ACCTC), owned and operated by InnoTech, to test and de-risk carbon capture and conversion technologies as well as hydrogen technologies. To accommodate increased demand, ACCTC made changes to one bay to enable up to seven companies to concurrently test their technologies and transition from the demonstration and prototype stages into industry-deployable technologies.

InnoTech became a national cluster of Next Generation Manufacturing Canada (NGen) to support the development of new manufacturing and materials technologies that aim to improve mine productivity and support the clean energy transition.

C-FER has been working with clients to validate technologies for small nuclear reactors, including those using molten salt technologies.

InnoTech contributed to Alberta's net-zero goals through technical engagements with Alberta Carbon Hub operators to identify key challenges associated with successful CO2 storage projects.

InnoTech initiated an engineering design development project to create a larger-scale carbon fibre pilot plant and lab facilities. A future facility such as this will enable carbon fibre technologies to be de-risked at a larger production scale – creating new opportunities for Alberta's bitumen resources to be used to manufacture carbon fibre.

"Producing carbon fibre from Alberta's bitumen creates opportunities for the energy industry. As we transition away from bitumen as fuel, Alberta is well-positioned to lead this next frontier. We're proud to be the driving force behind this novel technology."

Laura Kilcrease, CEO, Alberta Innovates

InnoTech successfully completed the Aquatic Mesocosm joint industry project with funding from three oil sands producers. This project evaluated the chemical and ecological responses of different types of oil sands tailings and process water under a variety of natural ecological treatments.

GOAL 3

ALBERTA'S R&I SYSTEM IS STRENGTHENED THROUGH OUR STRATEGIC PARTNERSHIPS AND COLLABORATIONS.

Objective	KPIs	Baseline (Actuals 2020–21)	Actuals 2021–22	Actuals 2022–23	Target 2023–24	Actual 2023–24	Performance to Target#
3.1 Leverage partner relationships and funding to support the R&I system in Alberta	**3.1.1** $ attracted to Alberta Innovates from external sources	$43.5M*	$44.2M	$51.6M	$46.1M	$54.3M	↑

 # A bullseye symbol indicates performance was "on target" and arrows pointing up or down represent a variance more than 10 per cent above or below target, respectively.

** Targets are aligned to the combined budget amounts for (i) federal government transfers, (ii) external revenue and industry funding, and (iii) investment income on the most recent Consolidated Statement of Operations.*

Variance to Target

3.1.1 – Variance is attributed primarily to higher federal government transfers recognized in accordance with the terms of agreements as well as higher investment income due to increased interest rates.

Highlights

Alberta Innovates partnered with Corporate Knights, a leading sustainable-economy media and research organization, to launch the first Corporate Knights Future 50 report of Canada's fastest growing sustainable companies, released at Inventures 2022. This was followed with a second ranking in 2023 of emerging Canadian companies whose business activities align with the transition to a clean economy.

C-FER collaborated with several U.S.-based research organizations to advance understanding in areas such as underground gas storage well integrity and the use of non-metallic pipe for transmission pipelines. This included Pipeline Research Council International, Lawrence Berkeley National Laboratory, the Gas Technology Institute and the Pipeline and Hazardous Materials Safety Administration.

The Hydrogen Centre of Excellence has quickly become a core component of the nascent hydrogen ecosystem, helping to attract foreign investment, deploy new infrastructure and raise public awareness about hydrogen as an energy source.

Alberta Innovates leveraged its strong relationship with Natural Resources Canada (NRCan) to attract $15 million of federal funding to HCOE Competitions 1 and 2 and partnered with ERA for its $25 million Hydrogen Challenge. This allowed for larger and broader competitions while enabling redeployment of HCOE funding to support additional future programming.

The Health Research Ethics Board of Alberta partnered with the Ontario Cancer Research Ethics Board to expedite pediatric cancer research. This partnership allows SickKids Hospital in Toronto, the Stollery Children's Hospital in Edmonton, and Alberta Children's Hospital in Calgary, to open the same research study at the same time at the different sites. This is the first partnership of its kind in Alberta and will allow for a joint ethics review while complying with provincial, federal and international regulations.

We continued to provide technical support to and combined programming with Emissions Reduction Alberta (ERA). Alberta Innovates staff actively managed more than 115 ERA projects valued at more than $4.3 billion. We also leveraged our investment by combined programming with ERA to advance carbon fibre (i.e., Bitumen Beyond Combustion) initiatives.

In September 2023, we co-hosted the Alberta Clinical Research Consortium annual conference with Network of Networks (N2) and the National Research Council.

More than 180 attended the event which showcased Alberta's strengths in clinical research across priority areas, also innovators and companies, advances in therapies and biomanufacturing, and emerging opportunities for Alberta to deliver better care through R&I.

Also in September 2023, we signed a Memorandum of Understanding with Nordic Health Lab of Denmark to accelerate ideas, collaborate and build a better, more vibrant health ecosystem for both Alberta and Denmark.

We are expanding the existing processing facility at the Bioprocessing Innovation Centre (BPIC), in partnership with Prairies Economic Development Canada (PrairiesCan) and Alberta Agriculture and Irrigation. This expansion will fill gaps in the existing capacity to support the development, scaleup and optimization of production processes for identified industries. It will also provide necessary technical services to the biomaterials industry. Upon completion of the project, BPIC will be the only facility in Western Canada to provide a one-stop shop to support the growth of the biomaterial sector.

The Alberta SPOR[4] SUPPORT Unit (AbSPORU) provided in-kind services, capacity development, trainee and knowledge mobilization support to the University of Calgary's "One Child, Every Child: A Transformational Health Research Initiative." This initiative received a historic investment of $268 million through the Canada First Research Excellence Fund.

AbSPORU also collaborated with the Alberta Health Services Indigenous Wellness Core and the Métis Settlements Health Board on a digital health initiative aimed at improving health equity and culturally safe primary care.

We launched the Ethics of Innovation Consortium with the University of Alberta, to help innovators and organizations incorporate ethics approaches in the design and implementation of digital- and data-enabled technologies. A new course titled "Ethics for Innovators" was piloted for SMEs, innovators, policy-makers and organizations. It outlines a critical thinking approach to ethical principles from concept to development and implementation of their innovation.

A pRoject Ethics Consensus Community Initiative (ARECCI) focused on ethics in research, quality improvement and evaluation at its annual conference in September. Representatives from health care delivery organizations and provincial ministries in Alberta and British Columbia drafted an Organized Recognized Review (ORR) Framework that aims to build capacity for organizations to conduct their own ethics review of quality improvement and evaluation projects.

Complementing funds received from Alberta Innovates in 2023–24, RINs acquired more than $18 million in additional funding from current and new partners such as PrairiesCan, the National Research Council, Emissions Reduction Alberta, City of Medicine Hat and the Natural Sciences and Engineering Research Council of Canada (NSERC).

Our TDAs and RINs actively engaged in co-work and referrals with federal and provincial organizations such as NRC-IRAP, MITACS and PrairiesCan.

We partnered with six Alberta entities in 2023–24 through our Ecosystem Development Partnerships (EDP) program to strengthen economic competitiveness and foster a thriving health innovation community. Projects supported activities such as capacity development, medical device and digital health technology development, prototyping, validation and market fit expertise.

The EDP program also provided investment to support strategic readiness and unification and growth of emerging technology ecosystems. For example, the Canadian Blockchain Consortium received initial capital to support the market analysis and planning for the development of a white paper. This publication was critical to establish the government's position and contributed to investment traction for data centres and established Alberta as a leader in the national consortium.

While we were advancing priorities of the Alberta Technology and Innovation Strategy (ATIS) during 2023–24, we also remained strategically aligned with federal research programs including NSERC, Canadian Institutes of Health Research (CIHR) and others through our programs such as Advance, Campus Alberta Small Business Engagement and LevMax.

[4] *Strategy for Patient Oriented Research (SPOR)*

In the lead-up to COP28, Alberta Innovates initiated the co-ordination of methane emissions reduction leaders in Alberta to bring forward a strategic “Team Alberta” approach. The new group, called Methane Emission Technology Solutions, includes Modern West Advisory, Petroleum Technology Alliance Canada, NGIF, Tourmaline and the University of Calgary.

We continued to collaborate with the Government of Alberta, the Government of Canada and other national bodies on nuclear energy. A Memorandum of Understanding was signed with Atomic Energy Canada Limited (AECL) to enable research, technology-sharing and innovation collaboration. In February 2024, Alberta Innovates hosted AECL, Canadian Nuclear Laboratories, Government of Alberta and agency representatives, InnoTech, C-FER and industry in a two-day workshop to advance collaboration on small modular nuclear reactors and hydrogen. Alberta Innovates also signed onto the Hydrogen Safety Centre initiative led by Canadian Nuclear Laboratories as a supporting partner.

GOAL 4

ROBUST STAKEHOLDER CONNECTIVITY EXISTS ACROSS ALBERTA'S INNOVATION SYSTEM.

Objective	KPIs	Baseline (Actuals 2020–21)	Actuals 2021–22	Actuals 2022–23	Target 2023–24	Actual 2023–24	Performance to Target#
4.1 Provide opportunities to strengthen the innovation journey by bringing together entrepreneurs, investors, researchers and global thought leaders.≠	**4.1.1** #/% of local, national and international participants attending Inventures	*	*	3,056	3,800	3,096	↓
4.2 Build increased recognition and support for Alberta Innovates' value in the provincial R&I system	**4.2.1** % of Albertans aware of Alberta Innovates	59%	54%	54%	≥54%	59%**	◎

 # A bullseye symbol indicates performance was "on target" and arrows pointing up or down represent a variance more than 10 per cent above or below target, respectively.

** Inventures was not held in 2020 or 2021 due to the COVID-19 pandemic.*

*** Public opinion survey conducted in October 2023.*

≠ Two KPIs outlined in the 2023-26 Business Plan were removed as operational changes led to data no longer being collected. Data for 4.1.2 was no longer available when the Unbound content model was adapted to an integrated web-based format in response to rapidly evolving online content consumption preferences. Similarly, data for 4.1.2 ended when the LearnHow platform was discontinued in 2023-24 with the launch of our new corporate website.

Variance to Target

4.1.1 – Earlier projections for Inventures attendance in 2023–24 were forecast shortly after the COVID-19 disruption of annual conference and travel trend lines. Projections were based on the expected return of market appetite for in-person conferences and networking, but also faced the rapid increase in post-COVID conference offerings.

Highlights

Inventures 2023 attracted 3,096 attendees from 32 countries, featured 298 speakers, had 42 participants in pitch competitions and reached a broader audience of viewers, with a combined 638 hours of Inventures Unbound livestream programming. This premier innovation event saw $139 million to $256 million in business carried out, negotiated or begun at the conference and it created $2.5 million in economic activity.

The Scaleup GAP program led a delegation of 50 founders to South by Southwest's (SXSW) annual technology conference in March 2024. Delegates reported more than 1,300 new connections and benefited from more than 4,350 interactions due to Alberta Innovates social media coverage of the event. Three new deals were closed during the trip.

Alberta Innovates continued to actively promote our experts, capacity and capabilities through earned media outreach to local and national media, industry influencers and a mix of paid media across multiple platforms. Alberta Innovates, InnoTech and C-FER websites collectively attracted 279,634 new users in 2023, representing an increase of 37,000 from the previous year.

We expanded the awareness of our thought leadership by hosting events such as Inventures and webinars, and through the participation of our staff as panelists and speakers at conferences and roundtables.

A delegation of Alberta Innovates, C-FER and InnoTech senior leaders attended the 28th meeting of the Conference of Parties to the United Nations Framework Convention on Climate Change (COP28). Through panels, meetings and networking events, the delegation engaged with others from around the world about initiatives and innovations in energy, clean technology and agriculture that help advance a net-zero economy.

Alberta Innovates, C-FER and InnoTech demonstrate our knowledge and expertise as participants, panelists and speakers at recognized events such as the Canadian Hydrogen Convention, World Petroleum Congress, ADIPEC in Abu Dhabi, Carbon Capture Canada Conference and Thrive Global Impact Summit. These events also provide an opportunity to showcase our supports and services to potential clients and partners.

"Attending with such a strong delegation truly supercharged the experience. I attended SXSW last year on my own and the opportunities brought forward by Alberta Innovates and the entire delegation working together to share insights were infinitely more valuable!!"

SXSW Alberta Innovates delegate

Our facilities and experts attracted government and industry representatives from Canada and around the world. In 2023–24, we toured and briefed visitors from Japan, the United Kingdom, Denmark, Vietnam, Argentina, China, Korea and the United States who were interested in learning more about how our expertise and facilities are advancing innovative solutions.

We continued outreach activities that included seeking partnerships and engaging with provincial and national organizations and agencies to increase opportunities for Alberta innovations and entrepreneurs to be successful.

Twelve researchers who received support through our Advance and Campus Alberta Small Business Engagement programs were finalists of the 2023 ASTech Awards, which honour the best of the best in science and technology innovation in Alberta. The finalists contributed to the fields of health care, AI/ML, aerospace technology and energy/cleantech including environmental applications.

Expertise at the Health Research Ethics Board of Alberta, an initiative hosted by Alberta Innovates, is being leveraged by the Office of Information and Privacy Commission to support the review of regulations related to research.

C-FER continued to foster a strong relationship with Edmonton Global to help support the subsidiary's brand recognition globally and create future business opportunities.

C-FER and InnoTech's Technical Advisory Committee includes membership from Canadian industry.

Through this participation, our subsidiaries are strongly positioned to identify the gaps and challenges facing industry and identify opportunities where our corporation can provide technical support to overcome these challenges.

C-FER maintained and strengthened relationships with Canadian, United States and internationally based industry organizations such as the Canadian Standards Association, Pipeline Research Council International, American Petroleum Institute and the International Standards Organization. C-FER participates in technical workshops on a common challenge or technical topic, provides technical expertise to standards and code development, and submits joint applications with U.S.-based organizations.

We continued to participate in health technology and innovation workshops and conferences such as MedTech Canada, Alberta Health Services i4 Conference, BIO International Convention and others. Through these activities, Alberta Innovates continued to position Alberta as a citizen-centred health system, showcased leaders across the health spectrum, and highlighted our programs and investments in talent, research, commercialization and health system transformation.

The RINs funded by Alberta Innovates collectively supported the collaboration and growth of companies across the province by sharing services and co-developing programs. The RINs currently have a network of 132 active partners across the ecosystem. These include economic development agencies; for-profit and not-for-profit groups; post-secondary institutions; companies; cities, towns and municipalities; provincial and federal agencies; First Nations; and other EDI-represented organizations.

Nearly 50 per cent of the RIN partners are rural and provide entrepreneurial supports across all geographic areas in the province.

More than 400 events were hosted by the RINs in 2023–24 to create and nurture connectivity and collaboration across innovation stakeholders and companies.

Our Technology Development Advisors continued to be active players in the innovation ecosystem. They represented Alberta Innovates at more than 450 events in 2023–24 and average 25,000 engagements with stakeholders and companies annually.

We continued to provide valued input to the Bitumen Value Enhancement Committee, a forum bringing together academic and industry leaders working together to strategically align technology opportunities around bitumen value-addition.

An updated version of Alberta Innovates' Bitumen Beyond Combustion (BBC) White Paper in November 2023. This vision to transform how bitumen can be used in a low-carbon world was shared with our strategic partners and released to the public.

We also released the Spring 2024 edition of Making Waves, Alberta Innovates' annual publication highlighting our investments through our Water Innovation Program and our progress toward the goals of Alberta's Water for Life Strategy.

GOAL 5

VALUE FOR OUR ORGANIZATION AND CLIENTS IS CREATED WITH FUTURE-FOCUSED BUSINESS PRACTICES AND CONTINUOUS IMPROVEMENTS IN OPERATIONAL EXCELLENCE.

Objective	KPIs	Baseline (Actuals 2020–21)	Actuals 2021–22	Actuals 2022–23	Target 2023–24	Actual 2023–24	Performance to Target#
5.1 Build a future- focused organization grounded in continuous improvement	**5.1.1** Cumulative % reduction in client requirements for accessing Alberta Innovates programs and services (Red Tape Reduction)	30.6%	61.7%	72.6%	55-60%	73.7%	↑
	5.1.2 % of clients with a positive client experience	94%	90%	86%	≥90%	89%	◎
5.2 Promote a culture that attracts, engages and retains top talent.	**5.2.2** Overall employee engagement rating on biennial survey*	69%	69%	*	72%	66%	◎
5.3 Develop equity, diversity and inclusion (EDI) framework for the organization to drive lasting change.	**5.3.1 %** of applicants who identify as a member of a visible minority	36%	56%	44%	≥27.8%**	42%	◎

 # A bullseye symbol indicates performance was "on target" and arrows pointing up or down represent a variance more than 10 per cent above or below target, respectively.

** Data collected in Q3 of every other fiscal year. Last survey November 2023.*

*** Target adjusted based on most recent Census of Canada data for visible minorities in Alberta (2021).*

Variance to Target

5.1.1 – We are within 10 per cent variance of our actual from 2022–23 and well above the Government of Alberta targets for the Red Tape Reduction initiative. The target was overly conservative given our 2022–23 actuals.

Highlights

Alberta Innovates and our subsidiaries continued to adjust programs and services to reflect equity diversity and inclusion (EDI) and environmental, social and governance (ESG) best practices. This included monitoring policies for fairness and adjusting them to ensure equitable participation of Indigenous proponents in program offerings.

- We have adjusted eligibility criteria for our health talent programs with a focus on fostering participation from more diverse types of talent and post-secondary institutions, including those based in rural and northern communities. This resulted in six new post-secondary institutions signed on to administer our studentship programs.
- Our RINs are required to engage in EDI-funded activities and pursue EDI-led representation in their partnership structures. In 2023–24, RINs organized 60 EDI-specific events and programming with 2,500 total EDI-identified participants.

Alberta Innovates continues to monitor and review changing attitudes and approaches to ESG while also monitoring shifting cultural and societal views on the economy. This is completed through regular environmental scanning activities.

Active support of Truth and Reconciliation occurs through staff training, land acknowledgements and corporate initiatives on the National Day of Truth and Reconciliation. More than 60 per cent of our employees have participated in Indigenous Introductory Training. The Sacred Science video series, developed in collaboration with Indigenous communities, Alberta Innovates and InnoTech, combines Indigenous and Western science perspectives to advance understanding between scientists and Indigenous communities. C-FER is working closely with two First Nations to identify intentional ways to work in partnership on energy projects.

RINS have demonstrated high effectiveness in creating quality EDI-based engagement. The BIPOC Foundation, Immigrant Techies, Alberta Women Entrepreneurs, The 51, Blackfoot Confederacy Tribal Council, Black Business Ventures Association, Blood Tribe Economic Development, Community Futures Treaty 7, Piikani Resource Development and Papaschase First Nation are some of the groups actively engaged with RINs around the province.

For the third year in a row, Alberta Innovates and InnoTech were recognized as one of Alberta's top employers via Alberta's Top 80 Employers' list. This list highlights Alberta companies that are leaders in offering outstanding work environments.

Alberta Innovates remains committed to investing in the growth and development of our employees. In 2023, the organization commenced a three-year leadership program that targeted 150 employees to provide competencies that enable leaders to understand and better navigate a changing business environment.

We continued to make it easier for our clients to access our programs and services. We have reduced requirements for our clients by nearly 74 per cent since 2019–20, by standardizing grant application forms, reports and other client tools. This improvement is more than double the target set by the Government of Alberta in its Red Tape Reduction Initiative.

Alberta Innovates continues to explore ways to increase operational efficiencies and become a data-driven organization through new platforms and technologies to support information management, contracts and data, and data management. In 2023, we launched Client Insights, a customer relationship management system.

MANAGEMENT DISCUSSION & ANALYSIS

THE RESULTS IN ALBERTA INNOVATES CONSOLIDATED FINANCIAL STATEMENTS ARE FOR R&I ACTIVITIES SUPPORTING ORGANIZATIONAL OBJECTIVES FOR THE ECONOMIC AND SOCIAL WELL-BEING OF ALBERTANS, IN ALIGNMENT WITH GOVERNMENT OF ALBERTA PRIORITIES. THIS INCLUDES, WITHOUT LIMITATION, ACTIVITIES DIRECTED AT THE DISCOVERY, COMMERCIALIZATION AND APPLICATION OF KNOWLEDGE IN THE SECTORS OF AGRICULTURE, ENERGY, ENVIRONMENT, FORESTRY, HEALTH AND OTHER SECTORS DETERMINED BY THE REGULATIONS.

Two wholly owned subsidiary corporations, C-FER Technologies (1999) Inc. and InnoTech Alberta Inc., along with the Alberta Foundation for Health Research, are also reporting entities of Alberta Innovates.

The Office of the Auditor General Alberta issued an unqualified audit report on the consolidated financial statements for the year ending March 31, 2024.

Revenue

2023–24 total revenue of $263.7 million was higher than the budget and prior year by $16.5 million and $18.6 million, respectively. This was primarily due to additional revenue from the Ministry of Technology and Innovation to allow Alberta Innovates to fund the approved budget expenditures. Additional restricted grant funding received in prior years and higher Federal Government Transfers have also been recognized as revenue in accordance with the terms of the Agreements.

Investment income was higher than budget and prior year due to increased interest rates.

External revenue and industry funding, generated primarily by InnoTech and C-FER, remained stable at approximately $42 million.

Expenses

The expenses have been expressed in terms of Alberta Innovates business lines:

Research, Innovation & Commercialization: Includes investments in Accelerators, Clean Resources, Entrepreneurial Investments, Health, and Post-Secondary Investments & Emerging Technologies.

Research, Innovation and Commercialization expenses of $155.4 million were comparable to the prior year and $5.4 million lower than budget. This was primarily due to the timing of grant Investment Agreements, Amendments and milestone payments.

Applied Research: Includes expenses for InnoTech Alberta Inc. and C-FER Technologies (1999) Inc.

Applied Research expenses of $53.5 million were higher than budget by $4.0 million mainly due to the impact of inflation on supplies and services.

Administration: Includes all corporate services such as Corporate Planning and Reporting, Facilities Services, Finance, General Counsel, Human Resources, Information Technology, and Marketing and Communications. These are essential backbone functions in the Corporation that provide support to the Research, Innovation & Commercialization and Applied Research business lines, thereby enabling productive and efficient operations that advance Alberta Innovates towards its strategic priorities and goals.

Administration expenses were higher than budget and prior year actuals by $1.1 million and $3.6 million, respectively. This was primarily due to the impact of inflation on supplies and services as well as increased labour costs.

Amortization: Includes amortization for all business lines.

Amortization of $7.1 million was comparable to the prior year and $1.8 million lower than budget due to the timing of capital asset purchases and subsequent timing of amortization.

Alberta Innovates receives a budgeted revenue and expense target from the Government of Alberta. The gross operating expense target includes amortization and inter-governmental transfers. Inter-governmental transfers are grants or contracts to other government entities that are then eliminated upon consolidation by the Government of Alberta. Alberta Innovates' net expense target of $183.4 million is spending that the organization can direct to strategic priorities and operations. Alberta Innovates' net operating expenses were comparable to budget.

(dollars in thousands)

	2023–24 Budget	2023–24 Actual	2022–23 Actual
Gross Operating Expenses	$ 252,896	$ 250,834	$ 248,832
Amortization	$ (8,900)	(7,092)	$ (7,248)
Inter-governmental transfers	$ (60,610)	(60,064)	$ (62,357)
Net Operating Expenses	**$ 183,386**	**$ 183,678**	**$ 179,227**

Committed Funding

Alberta Innovates has funding commitments for specific purposes that are allocated over time. In addition, Alberta Innovates receives funding from third parties, including partnerships, that may require Alberta Innovates to match the third-party funding. The funding grant must meet all eligibility criteria, the expenditure must be a contractual obligation, and the grant must be approved before the expenditure is recognized as an expense in the financial statements. Other funding sources are allocated to Alberta Innovates by agreement. The agreement must be approved in accordance with internal policies and standards before the expenditure is incurred and recorded as an expense in the financial statements.

Alberta Innovates has $133.3 million of contractual obligations that will become liabilities over the next five years.

CAPITAL PLANNING AND LEASE ARRANGEMENTS

Alberta Innovates and its subsidiaries occupy a significant inventory of research and office facilities, most of which are owned and operated by Alberta Infrastructure. In addition to the Government of Alberta facilities, we also occupy space with commercial lease arrangements. Alberta Innovates currently operates across 11 locations – Edmonton (5), Calgary (3), Devon, Vegreville and Victoria, B.C., with well over 1.2 million square feet of space and 600 acres of research farmland. In addition to our facilities, we also have a substantial inventory of research equipment with an estimated replacement asset value in excess of $180 million.

Capital Planning

Adequate infrastructure is a critical and necessary requirement to support our vision, sustain program effectiveness and manage program growth aligned to corporate and provincial priorities.

The Facilities Services team at Alberta Innovates works with the Ministry of Technology and Innovation, the Ministry of Infrastructure and our corporate Finance team to offer strategic and operational support for program accommodation, capital project planning, budgeting and project implementation for Alberta Innovates and its subsidiaries. The table below summarizes all capital categories and their corresponding funding information.

Alberta Innovates Capital Program *(dollars in thousands)*

	2023–24 Budget	2023–24 Actual	2022–23 Actual
Capital Target			
Capital Investment - T&I Base Grant Funding			
Capital Maintenance and Renewal (CMR)	$ 4,807	$ 5,222	$ 1,971
Hydrogen Centre of Excellence (note 1)	5,000	3,485	633
Pressure Reaction Tower System (note 2)	1,000	925	1,075
Design Development - Intermediate Scale Carbon Fibre Pilot Facility	400		-
Design Development – Larger Scale Fermentation & Support Equipment	400	-	-
	$ 11,607	$ 9,632	$ 3,679
Capital Investment – Other			
Alberta Innovates Self – Financed Investment	$ 8,500	$ 1,564	$ 2,388
BBC Carbon Fibre (federal funding) (note 3)	-	2,112	-
Hydrogen Centre of Excellence (federal funding) (note 1)	-	2,229	430
Other funded projects	-	876	-
	8,500	6,781	2,818
Total Capital Target	**$ 20,107**	**$ 16,413**	**$ 6,497**

Note 1 – The Ministry of Technology & Innovation and the federal government have invested $13.3 million funding over multiple years for the Hydrogen Centre of Excellence to establish unique facilities for the testing of hydrogen infrastructure, equipment, and technologies. $6.8 million has been spent as of March 31, 2024 ($5.7 million in 2023–24) on various approved capital projects at different stages of the project life cycle – design, planning and construction.

Note 2 – The Pressurized Reaction Tower system can chemically and thermally treat fibrous material such that it can be used in higher value textiles, paper, specialty packaging and chemical products. Capital funding of $2 million received from the Ministry of Technology & Innovation over two fiscal years has been fully spent.

Note 3 – The federal government has invested $10 million into a Bitumen Beyond Combustion Carbon Fibre Facility which includes equipment to pre-treat feedstock before spinning it into green filaments and a continuous carbon fibre processing system to convert filaments to carbon fibre at the pilot scale. As of March 31, 2024, $2.1 million has been completed in 2023–24 on planning, engineering and equipment procurement.

Commercial Lease Arrangements

Our Facilities Services team works diligently to ensure effective space utilization for program accommodation. The Victoria Group and C-FER East Pylypow leases have been renewed. We have also consolidated our Bell Tower operations by moving staff from the 11th floor to the 14th floor.

REPORT ON RISK MANAGEMENT

Alberta Innovates embeds risk management practices into its strategic, business and operational planning to drive effective and accountable action and decision-making, management practice and Board governance oversight. Our enterprise risk management framework is consistent with generally accepted global risk management standard frameworks, aligns with the Government of Alberta's risk management framework and reflects adoption of best practices.

Our Executive reviewed and updated our corporate-level risks each quarter in 2023–24. Each risk was assigned an overall rating based on the likelihood of the risk occurring and the potential impact of the risk on our goals and operations. Informed approaches on how best to respond to the individual risks were also developed and implemented as necessary. The corporate risk register – which includes all the information above – was reviewed by our Board of Directors each quarter.

The key risks faced by Alberta Innovates last year were:

Budget Reductions and Limitations on Expenditures

Our organization's ability to fund and transform the R&I system in Alberta can be adversely affected by reductions to our budget and limitations on expenditures.

In 2023–24, our Board and Executive team worked closely with the Ministry to obtain an additional $20 million of base operating funding over a three-year period ending in 2025–26. These funds will cover approved budget expenditures in those years.

We continue to leverage our partnerships, both new and existing, to bring in additional revenue and contracts for Alberta Innovates and our subsidiaries.

Resource Recruitment and Retention

Our workforce is key to our efforts to meet our mandate, steer the innovation system and bring benefits to Albertans. Limitations such as the labour market conditions, budget reductions, legislative directives (including salary restraints) and other mandates can affect our ability to recruit and retain highly qualified staff and ensure we are adequately resourced to meet the needs of our stakeholders and clients.

Tools such as our biennial Employee Engagement Survey, last completed in Fall 2023, assist us in understanding how we can continually improve our workplace and drive our performance forward.

Our brand and marketing strategies, including our brand awareness survey which is completed annually in the fall, provide an effective way to continue to build, reinforce and monitor our reputation in the ecosystem.

Long-Term Investment Model and Demonstrating Impact

Reporting complexities, competing demands on our resources – and, in some cases, longer-term investments required to advance innovation – may affect our ability to fulfill our mandate and adequately demonstrate the impact of our investments within yearly budget cycles. This could potentially lead to a loss of confidence about the impacts made by Alberta Innovates.

We consistently review and continuously improve our processes to measure, monitor and report on the value we generate, including target-setting and more in-depth analyses of results and impacts.

Our staff maintain existing and build new relationships with our colleagues in the ministry and, more specifically, our Senior Management Team is engaged in various discussions with the Ministry of Technology and Innovation and other ministries to provide input into guiding strategies for the R&I system in Alberta.

MANAGEMENT'S RESPONSIBILITY FOR REPORTING

Alberta Innovates management is responsible for the preparation, accuracy, objectivity and integrity of the information contained in the annual report including the consolidated financial statements, performance results and supporting management information. Systems of internal control are designed and maintained to produce reliable information that meet reporting requirements, and to ensure that transactions are executed in accordance with all relevant legislation, regulations and policies, reliable financial records are maintained, and assets are properly accounted for and safeguarded. The annual report has been approved by the Board of Directors and is prepared in accordance with ministerial guidelines.

The Auditor General of the Province of Alberta, the corporation's external auditor appointed under the *Auditor General Act*, performs an annual independent audit of Alberta Innovates' consolidated financial statements in accordance with Canadian generally accepted auditing standards.

Original signed by Laura Kilcrease

Chief Executive Officer

Original signed by Barry McNabb

Vice President, Finance

STATUTORY REPORT

PUBLIC INTEREST DISCLOSURE ACT

Section 32 of the *Public Interest Disclosure Act* requires the corporation to report annually on the following parts of the Act:

(a) the number of disclosures received by the designated officer of the Public Interest Disclosure Office, the number of disclosures acted on and the number of disclosures not acted on by the designated officer;

(b) the number of investigations commenced by the designated officer as a result of the disclosures; and

(c) in the case of an investigation that results in a finding of wrongdoing, a description of the wrongdoing and any recommendations made or corrective measures taken in relation to the wrongdoing or the reasons why no corrective measure was taken.

A complaint alleging failure to adhere to due diligence standards was filed against four employees pursuant to the Alberta Innovates Whistleblower Policy. The complaint was investigated, and the allegations were founded. A report was issued to the CEO in December 2023 and performance plans and monitoring were implemented as corrective measures.

AUDITED FINANCIAL STATEMENTS

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Auditor General OF ALBERTA

Independent Auditor's Report

To the Board of Directors of Alberta Innovates

Report on the Consolidated Financial Statements

Opinion

I have audited the consolidated financial statements of Alberta Innovates (the Group), which comprise the consolidated statement of financial position as at March 31, 2024, and the consolidated statements of operations, change in net financial assets, and cash flows for the year then ended, and notes to the consolidated financial statements, including a summary of significant accounting policies.

In my opinion, the accompanying consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Group as at March 31, 2024, and the results of its operations, its changes in net financial assets, and its cash flows for the year then ended in accordance with Canadian public sector accounting standards.

Basis for opinion

I conducted my audit in accordance with Canadian generally accepted auditing standards. My responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Consolidated Financial Statements* section of my report. I am independent of the Group in accordance with the ethical requirements that are relevant to my audit of the consolidated financial statements in Canada, and I have fulfilled my other ethical responsibilities in accordance with these requirements. I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my opinion.

Other information

Management is responsible for the other information. The other information comprises the information included in the *Annual Report*, but does not include the consolidated financial statements and my auditor's report thereon. The *Annual Report* is expected to be made available to me after the date of this auditor's report.

My opinion on the consolidated financial statements does not cover the other information and I do not express any form of assurance conclusion thereon.

In connection with my audit of the consolidated financial statements, my responsibility is to read the other information identified above and, in doing so, consider whether the other information is materially inconsistent with the consolidated financial statements or my knowledge obtained in the audit, or otherwise appears to be materially misstated.

If, based on the work I will perform on this other information, I conclude that there is a material misstatement of this other information, I am required to communicate the matter to those charged with governance.

Responsibilities of management and those charged with governance for the consolidated financial statements

Management is responsible for the preparation and fair presentation of the consolidated financial statements in accordance with Canadian public sector accounting standards, and for such internal control as management determines is necessary to enable the preparation of the consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, management is responsible for assessing the Group's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless an intention exists to liquidate or to cease operations, or there is no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Group's financial reporting process.

Auditor's responsibilities for the audit of the consolidated financial statements

My objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes my opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Canadian generally accepted auditing standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements.

As part of an audit in accordance with Canadian generally accepted auditing standards, I exercise professional judgment and maintain professional skepticism throughout the audit. I also:

- Identify and assess the risks of material misstatement of the consolidated financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for my opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Group's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's ability to continue as a going concern. If I conclude that a material uncertainty exists, I am required to draw attention in my auditor's report to the related disclosures in the consolidated financial statements or, if such disclosures are inadequate, to modify my opinion. My conclusions are based on the audit evidence obtained up to the date of my auditor's report. However, future events or conditions may cause the Group to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. I am responsible for the direction, supervision and performance of the group audit. I remain solely responsible for my audit opinion.

I communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that I identify during my audit.

[Original signed by W. Doug Wylie FCPA, FCMA, ICD.D]
Auditor General

May 24, 2024
Edmonton, Alberta

Classification: Public

ALBERTA INNOVATES
CONSOLIDATED STATEMENT OF OPERATIONS
YEAR ENDED MARCH 31, 2024

	2024		2023
	(Note 5) Budget	Actual	Actual
	(in thousands)		
Revenues (Note 2 (b))			
Government transfers			
Funding from Technology and Innovation			
Base operating grant	$ 162,346	$ 163,146	$ 147,040
Strategic relationship grants	18,000	15,984	17,527
Deferred grants from prior years	12,100	20,195	16,857
Deferred capital contribution	3,000	2,351	1,929
Funding from other Government of Alberta entities - other grants	4,260	6,018	7,993
Federal government transfers	3,600	8,163	7,201
External revenue and industry funding	42,000	42,861	41,790
Investment income	500	3,233	2,621
Other Government of Alberta revenue	1,426	1,786	2,137
	247,232	263,737	245,095
Expenses (Note 2 (b) and Schedule 1)			
Research, innovation and commercialization	160,769	155,416	155,500
Applied research	49,522	53,536	54,920
Administration	33,705	34,790	31,164
Amortization	8,900	7,092	7,248
	252,896	250,834	248,832
Annual surplus (deficit)	(5,664)	12,903	(3,737)
Accumulated surplus at beginning of year	30,557	30,557	34,294
Accumulated surplus at end of year	$ 24,893	$ 43,460	$ 30,557

The accompanying notes and schedules are part of these consolidated financial statements.

ALBERTA INNOVATES
CONSOLIDATED STATEMENT OF FINANCIAL POSITION
AS AT MARCH 31, 2024

	2024	2023
	(in thousands)	
Financial assets		
Cash (Note 6)	$ 80,820	$ 90,431
Accounts receivable (Note 7)	22,148	15,805
	102,968	106,236
Liabilities		
Accounts payable and other accrued liabilities (Note 9)	27,646	24,064
Unspent deferred capital contributions (Note 10)	570	985
Deferred revenue (Note 10)	41,527	60,972
Deferred contract revenue (Note 10)	11,408	9,794
Asset retirement obligations (Note 11)	3,025	2,813
	84,176	98,628
Net financial assets	18,792	7,608
Non-financial assets		
Tangible capital assets (Note 13)	50,024	40,784
Prepaid expenses	4,996	2,150
	55,020	42,934
Net assets before spent deferred capital contributions	73,812	50,542
Spent deferred capital contributions (Note 10)	30,352	19,985
Net assets		
Accumulated surplus (Note 14)	$ 43,460	$ 30,557

Contractual rights (Note 8)

Contingent liabilities (Note 15)

Contractual obligations (Note 16)

The accompanying notes and schedules are part of these consolidated financial statements.

Approved by the Board of Directors

Original signed by Tony Williams

Tony Williams
Board Chair
May 24, 2024

Original signed by Dr. H.J (Tom) Thompson

Dr. H.J (Tom) Thompson
Audit Chair
May 24, 2024

ALBERTA INNOVATES
CONSOLIDATED STATEMENT OF CHANGE IN NET FINANCIAL ASSETS
YEAR ENDED MARCH 31, 2024

	2024		2023
	Budget	**Actual**	**Actual**
		(in thousands)	
Annual surplus (deficit)	$ (5,664)	$ 12,903	$ (3,737)
Acquisition of tangible capital assets (Note 13)	(20,107)	(16,413)	(6,497)
Amortization of tangible capital assets (Note 13)	8,900	7,092	7,248
Net loss/(gain) on disposal of tangible capital assets		81	(2)
Proceeds on sale of tangible capital assets		-	2
(Increase)/Decrease in prepaid expenses		(2,846)	8
Net increase in spent deferred capital contributions (Note 10)		10,367	535
Increase (decrease) in net financial assets	(16,871)	11,184	(2,443)
Net financial assets at beginning of year	7,608	7,608	10,051
Net financial assets (net debt) at end of year	$ (9,263)	$ 18,792	$ 7,608

The accompanying notes and schedules are part of these consolidated financial statements.

ALBERTA INNOVATES
CONSOLIDATED STATEMENT OF CASH FLOWS
YEAR ENDED MARCH 31, 2024

	2024	2023
	(in thousands)	
Operating transactions		
Annual surplus (deficit)	$ 12,903	$ (3,737)
Non-cash items included in annual surplus (deficit):		
Amortization of tangible capital assets (Note 13)	7,092	7,248
Deferred contributions recognized as revenue (Note 10)	(134,785)	(130,981)
Net loss/(gain) on disposal of tangible capital assets	81	(2)
	(114,709)	(127,472)
Increase in accounts receivable	(6,343)	(2,163)
(Increase)/Decrease in prepaid expenses	(2,846)	8
Increase/(Decrease) in accounts payable and other accrued liabilities	3,582	(9,188)
Increase/(Decrease) in deferred contract revenue	1,614	(830)
Contributions restricted for operating (Note 10)	111,935	121,156
Increase in asset retirement obligations (Note 11)	212	146
Cash applied to operating transactions	(6,555)	(18,343)
Capital transactions		
Acquisition of tangible capital assets (Note 13)	(16,413)	(6,497)
Proceeds on sale of tangible capital assets	-	2
Cash applied to capital transactions	(16,413)	(6,495)
Financing transactions		
Contributions restricted for capital (Note 10)	13,357	3,373
Cash provided by financing transactions	13,357	3,373
Decrease in cash	(9,611)	(21,465)
Cash at beginning of year	90,431	111,896
Cash at end of year	$ 80,820	$ 90,431

The accompanying notes and schedules are part of these consolidated financial statements.

ALBERTA INNOVATES
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS
MARCH 31, 2024

Note 1 AUTHORITY AND PURPOSE

Alberta Innovates is a Provincial corporation, as defined in the *Financial Administration Act*. It was established effective November 1, 2016 under the *Alberta Research and Innovation Act*. The *Alberta Research and Innovation Act* was amended to dissolve the four corporations: Alberta Innovates - Bio Solutions, Alberta Innovates - Energy and Environment Solutions, Alberta Innovates - Health Solutions, and Alberta Innovates - Technology Futures and create one new research and innovation corporation, “Alberta Innovates.” Two wholly owned subsidiary corporations C-FER Technologies (1999) Inc. and InnoTech Alberta Inc. along with the Alberta Foundation for Health Research are also reporting entities of Alberta Innovates ("The Corporation").

The objectives of the Corporation are to support, for the economic and social well-being of Albertans, research and innovation activities aligned to meet Government of Alberta priorities, including, without limitation, activities directed at the discovery, commercialization and application of knowledge in the areas of agriculture, energy, environment, forestry, health and other areas determined by the regulations.

The Corporation is exempt from income taxes under the *Income Tax Act*.

Note 2 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES AND REPORTING PRACTICES

These consolidated financial statements are prepared in accordance with Canadian Public Sector Accounting Standards.

(a) Reporting Entity and Method of Consolidation

These consolidated financial statements reflect the assets, liabilities, revenue and expenses of the Corporation and its wholly owned subsidiaries InnoTech Alberta Inc., C-FER Technologies (1999) Inc. and the Alberta Foundation for Health Research (AFHR). The AFHR operates under the *Alberta Companies Act* and is a registered charitable organization for income tax purposes. All inter-entity balances and transactions have been eliminated on consolidation.

The accounts of government sector entities are consolidated using the line-by-line method. Under this method, accounting policies of the consolidated entities are adjusted to conform to the Corporation's accounting policies and the results of each line item in their financial statements (revenue, expense, assets, and liabilities) are included in the Corporation’s results. Revenue and expense, capital, investing and financing transactions and related asset and liability balances between the consolidated entities have been eliminated.

(b) Basis of Financial Reporting

Revenues

All revenues are reported on the accrual basis of accounting.

Revenues from transactions with performance obligations are recognized when the Corporation provides the promised goods and/or services to a payor. The Corporation uses the percentage of completion method to recognize revenue tied to performance obligations.

Cash received for goods and/or services not yet provided before year end is recognized as unearned revenue and recorded in deferred contract revenue under liabilities.

Revenues from transactions with no performance obligations are recognized at their realizable value the Corporation has the authority to claim or retain an inflow of economic resources and identifies a past transaction or event that gives rise to an asset.

Government Transfers

Transfers from all governments are referred to as government transfers.

Government transfers and associated externally restricted investment income are recognized as deferred revenue or deferred capital contributions if the eligibility criteria for use of the transfer, or the stipulations together with the Corporation’s actions and communications as to the use of the transfer, create a liability. These transfers are recognized as revenue as the stipulations are met and, when applicable, the Corporation complies with its communicated use of the transfer.

ALBERTA INNOVATES
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS (Continued)
MARCH 31, 2024

Note 2 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES AND REPORTING PRACTICES (Continued)

(b) Basis of Financial Reporting (Continued)

All other government transfers, without stipulations for use of the transfer, are recognized as revenue when the transfer is authorized and the Corporation meets the eligibility criteria (if any).

External Revenue and Industry Funding

External revenue is contract revenue that is recognized using the percentage of completion method. The Corporation makes full provision for all known or estimated losses on uncompleted contracts as soon as they can reasonably be estimated.

Investment Income

Investment income includes interest income. Investment income earned from restricted sources is deferred and recognized when the terms imposed have been met.

Other Government of Alberta Revenue

Other revenue is contract and fee for service work billed to Alberta Government ministries and agencies, post secondary institutions and school divisions.

Donations and Non-Government Contributions

Donations and non-government contributions are received from individuals, corporations, and private sector not-for-profit organizations. Donations and non-government contributions may be unrestricted or externally restricted for operating or capital purposes.

Unrestricted donations and non-government contributions are recognized as revenue in the year received or in the year the funds are committed to the Corporation if the amount can be reasonably estimated and collection is reasonably assured.

Externally restricted donations, non-government contributions and realized and unrealized gains and losses for the associated, externally restricted, investment income are recognized as deferred revenue if the terms for their use, or the terms along with the Corporation's actions and communications as to the use, create a liability. These resources are recognized as revenue as the terms are met and, when applicable, the Corporation complies with its communicated use.

In-kind donations of services and materials are recognized at fair value when such value can reasonably be determined.

Expenses

Expenses are reported on an accrual basis. The cost of all goods consumed and services received during the year are expensed.

Transfers include entitlements, grants and transfers under shared cost agreements. Grants and transfers are recognized as expenses when the transfer is authorized and eligibility criteria have been met by the recipient.

Valuation of Financial Assets and Liabilities

The Corporation’s financial assets and liabilities are generally measured as follows:

Financial Statement Component	Measurement
Cash	Cost
Accounts Receivable	Lower of Cost or Net Recoverable Value
Accounts Payable and Other Accrued Liabilities	Cost
Asset Retirement Obligations and Environmental Liabilities	Cost or Present Value

The Corporation has no assets or liabilities in the fair value category, has no significant foreign currency transactions and has no significant remeasurement gains or losses. Consequently, no statement of remeasurement gains and losses has been presented.

ALBERTA INNOVATES
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS (Continued)
MARCH 31, 2024

Note 2 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES AND REPORTING PRACTICES (Continued)

(b) Basis of Financial Reporting (Continued)

Financial Assets

Financial assets are assets that could be used to discharge existing liabilities or finance future operations and are not for consumption in the normal course of operations.

Financial assets are the Corporation's financial claims on external organizations and individuals, as well as cash.

Cash

Cash comprises of cash on hand and demand deposits.

Accounts Receivable

Accounts receivable are recognized at the lower of cost or net recoverable value. A valuation allowance is recognized when recovery is uncertain.

Liabilities

Liabilities represent present obligations of the Corporation to external organizations and individuals arising from past transactions or events occurring before the year end, the settlement of which is expected to result in the future sacrifice of economic benefits. They are recognized when there is an appropriate basis of measurement and management can reasonably estimate the amounts.

Liabilities also include:

- all financial claims payable by the Corporation at the year end;
- accrued employee vacation entitlements; and
- contingent liabilities where future liabilities are likely.

Asset Retirement Obligations

Asset retirement obligations are legal obligations associated with the retirement of a tangible capital assets (TCA). Asset retirement activities include all activities relating to an asset retirement obligation. These may include, but are not limited to;

- decommissioning or dismantling a tangible capital asset that was acquired, constructed or developed;
- remediation of contamination of a tangible capital asset created by its normal use;
- post-retirement activities such as monitoring; and
- constructing other tangible capital assets to perform post-retirement activities.

A liability for an asset retirement obligation is recognized when, as at the financial reporting date:

(a) there is a legal obligation to incur retirement costs in relation to a tangible capital asset;
(b) the past transactions or event giving rise to the liability has occurred;
(c) it is expected that future economic benefits will be given up; and
(d) a reasonable estimate of the amount can be made.

When a liability for asset retirement obligation is recognized, asset retirement costs related to recognized tangible capital assets in productive use are capitalized by increasing the carrying amount of the related asset and are generally amortized on a straight-line basis over the estimated useful life of the underlying tangible capital asset. Asset retirement costs related to unrecognized tangible capital assets and those not in productive use are expensed.

ALBERTA INNOVATES
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS (Continued)
MARCH 31, 2024

Note 2 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES AND REPORTING PRACTICES (Continued)

(b) Basis of Financial Reporting (Continued)

Environmental Liabilities

Contaminated sites are a result of contamination of a chemical, organic or radioactive material or live organism that exceeds an environmental standard, being introduced into soil, water or sediment. A liability for remediation of a contaminated site may arise from an operation that is either in productive use or no longer in productive use and may also arise from an unexpected event resulting in contamination. The resulting liability is recognized when all of the following criteria are met:

i. an environmental standard exists;
ii. contamination exceeds the environmental standard;
iii. the Corporation is directly responsible or accepts responsibility;
iv. it is expected that future economic benefits will be given up; and
v. a reasonable estimate of the amount can be made.

Other environmental liabilities are recognized when all of the following criteria are met:

i. the Corporation has a duty or responsibility to others, leaving little or no discretion to avoid the obligation;
ii. the duty or responsibility to others entails settlement by future transfer or use of assets, or a provision of services at a specified or determinable date, or on demand;
iii. the transaction or events obligating the Corporation have already occurred; and
iv. a reasonable estimate of the amount can be made.

Non-Financial Assets

Non-financial assets are acquired, constructed, or developed assets that do not normally provide resources to discharge existing liabilities, but instead:

(a) are normally employed to deliver government services.
(b) may be consumed in the normal course of operations; and
(c) are not for sale in the normal course of operations

Non-financial assets include tangible capital assets and prepaid expenses.

Tangible Capital Assets

Tangible capital assets are recognized at cost less accumulated amortization, which includes amounts that are directly related to the acquisition, design, construction, development, improvement or betterment of the assets. Cost includes overhead directly attributable to construction and developement, as well as asset retirement cost. The threshold for capitalizing new systems development is $250,000 and the threshold for major systems enhancements is $100,000. The threshold for all other tangible capital assets is $5,000. All land is capitalized.

Work in progress, which included facilities and improvements projects and development of information systems, is not amortized until after a project is complete (or substantially complete) and the asset is put into service.

Tangible capital assets, excluding land, are amortized on a straight-line basis over their estimated useful lives as follows:

Buildings and improvements	10-30 Years
Equipment	3-25 Years
Computer hardware and software	3-10 Years

Tangible capital assets are written down when conditions indicate that they no longer contribute to the Corporation's ability to provide goods and services, or when the value of future economic benefits associated with the tangible capital assets are less than their net book value. The net write-downs are accounted for as expenses in the Consolidated Statement of Operations.

Contributed tangible capital assets from non-related entities are recognized at their fair value at the time of contribution.

Prepaid Expenses

Prepaid expenses are recognized at cost and amortized based on the terms of the agreement.

ALBERTA INNOVATES
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS (Continued)
MARCH 31, 2024

Note 2 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES AND REPORTING PRACTICES (Continued)

(b) Basis of Financial Reporting (Continued)

Financial Risk Management

The Corporation's financial instruments include cash, accounts receivable and accounts payable and other accrued liabilities. The Corporation is not involved in any hedging relationships through its operations and does not hold or use any derivative financial instruments for trading purposes.

The Corporation's financial instruments are exposed to credit risk, market risk, and liquidity risk.

a) Credit Risk
Counterparty credit risk is the risk of loss arising from the failure of a counterparty to fully honour its financial obligations with the Corporation. The Corporation's accounts receivable are exposed to credit risk. Management manages this risk by continually monitoring the creditworthiness of counterparties and by dealing with counterparties that it believes are creditworthy.

b) Market Risk
Market risk is the risk of loss from unfavourable change in fair value or future cash flows of a financial instrument causing financial loss. Market risk is comprised of currency risk, interest rate risk and price risk. The Corporation's cash is exposed to interest rate risk. Management manages this risk by continually monitoring the Corporation's deposits in the Consolidated Liquidity Solution (CLS) and their corresponding rate of return.

c) Liquidity Risk
Liquidity risk is the risk that the Corporation will encounter difficulty in meeting obligations associated with its financial liabilities. The Corporation's accounts payable and other accrued liabilities are exposed to liquidity risk. Management manages this risk by continually monitoring cash flows.

Measurement Uncertainty

Measurement uncertainty exists when there is a variance between the recognized or disclosed amount and another reasonably possible amount. There is measurement uncertainity related to asset retirement obligations as it involves estimates in determining settlement amount, discount rates and timing of settlement. Changes to any of these estimates and assumptions may result in change to the obligation.

Asset retirement obligations, recognized as $3,025 (2023 - $2,813) in these financial statements, consists of estimated decommissioning costs for the Alberta Carbon Capture Technology Centre and estimated end of lease obligations at Bell Tower.

Note 3 CHANGE IN ACCOUNTING POLICY

Effective April 1, 2023, the Corporation adopted the PS3400 Revenue Standard. There were no changes to the measurement of revenues on adoption of the new standard.

At the beginning of the same fiscal reporting period, PSG-8 Purchased Intangibles Guidelines and PS 3160 Public Private Partnerships also came into effect. The new standard and guideline did not have any impact on the Corporation’s consolidated financial statements.

Note 4 FUTURE CHANGES IN ACCOUNTING STANDARDS

On April 1, 2026, the Corporation will adopt the following new conceptual framework and account standard approved by the Public Sector Accounting Board:

- **The Conceptual Framework for Financial Reporting in the Public Sector**

The Conceptual Framework is the foundation for public sector financial reporting standard setting. It replaces the conceptual aspects of Section PS 1000 Financial Statement Concepts and Section PS 1100 Financial Statement Objectives. The conceptual framework highlights considerations fundamental for the consistent application of accounting issues in the absence of specific standards.

- **PS 1202 Financial Statement Presentation**

Section PS 1202 sets out general and specific requirements for the presentation of information in general purpose financial statements. The financial statement presentation principles are based on the concepts within the Conceptual Framework.

Management is currently assessing the impact of the conceptual framework and the standard on the consolidated financial statements.

ALBERTA INNOVATES
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS (Continued)
MARCH 31, 2024

Note 5 BUDGET

(in thousands)

A preliminary business plan with a budgeted deficit of $5,664 was approved by the Board on March 23, 2023 and the full financial plan was submitted to the Minister of Technology and Innovation. The budget reported in the Consolidated Statement of Operations reflects the original $5,664 deficit and additional reclassifications required for more consistent presentation with current and prior year results.

Note 6 CASH

(in thousands)

	2024	2023
Cash	$ 80,820	$ 90,431

Cash in the amount of $80,820 (2023 - $90,431) includes deposits in the Consolidated Liquidity Solution (CLS) of the Province of Alberta amounting to $58,057 (2023 - $84,040).

As at March 31, 2024, $53,505 of the cash balance is restricted as it represents grants received that have restrictions on their use (2023 - $71,751).

Note 7 ACCOUNTS RECEIVABLE

(in thousands)

	2024			2023
	Gross amount	Allowance for doubtful accounts	Net recoverable value	Net recoverable value
Accounts receivable	$ 11,518	$ 435	$ 11,083	$ 8,148
Accrued income receivable	11,065	-	11,065	7,657
	$ 22,583	$ 435	$ 22,148	$ 15,805

Accounts Receivable are unsecured, non-interest bearing and reported at their estimated net recoverable value.

Note 8 CONTRACTUAL RIGHTS

(in thousands)

Contractual rights are rights of the Corporation to economic resources arising from contracts or agreements that will result in both assets and revenues in the future when the terms of those contracts or agreements are met.

	2024	2023
Contractual rights from operating contracts	$ 63,065	$ 84,718

	Operating contracts
2024-25	$ 32,783
2025-26	26,037
2026-27	3,135
2027-28	129
2028-29	46
Thereafter	935
	$ 63,065

ALBERTA INNOVATES
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS (Continued)
MARCH 31, 2024

Note 9 ACCOUNTS PAYABLE AND OTHER ACCRUED LIABILITIES

(in thousands)

	2024	2023
Accounts payable	$ 4,965	$ 4,474
Other accrued liabilities	22,681	19,590
	$ 27,646	$ 24,064

Note 10 DEFERRED CONTRIBUTIONS

(in thousands)

	2024	2023
Unspent deferred capital contributions (a)	$ 570	$ 985
Spent deferred capital contributions (b)	30,352	19,985
Deferred operating contributions (c)	41,527	60,972
Deferred contract revenue	11,408	9,794
	$ 83,857	$ 91,736

(a) Unspent deferred capital contributions

	2024			2023
	Government of Alberta	Other	Total	Total
Balance at beginning of year	$ 985	$ -	$ 985	$ 1,094
Cash contributions received/receivable during year	5,807	7,550	13,357	3,373
Transferred to spent deferred capital contributions	(6,222)	(7,550)	(13,772)	(3,482)
Balance at end of year	$ 570	$ -	$ 570	$ 985

(b) Spent deferred capital contributions

	2024			2023
	Government of Alberta	Other	Total	Total
Balance at beginning of year	$ 13,208	$ 6,777	$ 19,985	$ 19,450
Transferred from unspent deferred capital contributions	6,222	7,550	13,772	3,482
Less amounts recognized as revenue	(2,369)	(1,036)	(3,405)	(2,947)
Balance at end of year	$ 17,061	$ 13,291	$ 30,352	$ 19,985

(c) Deferred operating contributions

	2024			2023
	Government of Alberta	Other	Total	Total
Balance at beginning of year	$ 58,065	$ 2,907	$ 60,972	$ 67,850
Cash contributions received/receivable during the year	107,998	3,137	111,135	120,304
Interest income	800	-	800	852
Recognized as revenue:				
Grants	(126,709)	(3,871)	(130,580)	(127,193)
Interest income	(800)	-	(800)	(841)
Balance at end of year	$ 39,354	$ 2,173	$ 41,527	$ 60,972

ALBERTA INNOVATES
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS (Continued)
MARCH 31, 2024

Note 11 ASSET RETIREMENT OBLIGATIONS

(in thousands)

	2024	2023
Asset Retirement Obligations, beginning of year	$ 2,813	$ 2,667
Accretion expense	72	67
Revision in estimates	140	79
Asset Retirement Obligations, end of year	$ 3,025	$ 2,813

Tangible capital assets with associated retirement obligations include buildings and leasehold improvements.

Asset retirement obligations are initially measured as of the date the legal obligation was incurred, based on management's best estimate of the amount required to retire tangible capital assets and may be subsequently re-measured at each financial reporting date taking into account any new information and the appropriateness of assumptions used. The estimate of the liability is based on existing agreement, third party quotes, legislation and professional judgement.

Where a present value technique is used to measure a liability, the liability is adjusted for the passage of time and is recognized as accretion expense in the Consolidated Statement of Operations. When a present value technique is not used, the asset retirement obligation is measured at the current estimated cost to settle or otherwise extinguish the liability.

Included in asset retirement obligation estimate is $2,424 measured using a present value technique. At March 31, 2024, the undiscounted amount of estimated future cash flows required to settle this obligation is $2,831 and is discounted using a discount rate of 4.23%.

Asset retirement obligations are expected to be settled over the next 3 to 5 years.

For the year ended March 31, 2024, a recovery of $1,504 was recognized.

Note 12 BENEFIT PLANS

(in thousands)

(a) The Corporation participates in the multi-employer pension plans: Management Employees Pension Plan (MEPP), the Public Service Pension Plan (PSPP), as well as, a Supplementary Retirement Plan for Public Service Managers (MSRP). The Corporation does not have sufficient plan information on MEPP, PSPP or the MSRP to follow the standards for defined benefit accounting and therefore follows the standard for defined contribution accounting. Accordingly, pension expense recognized for the MEPP/PSPP/MSRP is comprised of employer contributions to the plan that are required for its employees during the year, which are calculated based on actuarially pre-determined amounts that are expected to provide the plan’s future benefits. The expense for these pension plans is equivalent to the annual contributions of $4,817 for the year ended March 31, 2024 (2023 - $5,104).

At December 31, 2023, the Management Employees Pension Plan reported a surplus of $1,316,313 (2022 – surplus of $924,735), the Public Service Pension Plan reported a surplus of $4,542,500 (2022 – surplus of $4,258,721) and the Supplementary Retirement Plan for Public Service Managers reported a deficiency of $21,343 (2022 – deficiency of $25,117). The Corporation is not responsible for future funding of the plan deficit other than through contribution increases.

(b) The Benefit Plans consists of the unfunded liability for the Corporation’s supplemental retirement plan, the benefits under which are paid for entirely by the Corporation when they come due. There are no plan assets. There are no active members remaining in the plan and one retired member eligible for benefits.

ALBERTA INNOVATES
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS (Continued)
MARCH 31, 2024

Note 13 TANGIBLE CAPITAL ASSETS

(in thousands)

	Land	Building and Improvements [2]	Equipment[3]	Computer Hardware & Software	2024 Total	2023 Total
Estimated Useful Life	Indefinite	10-30 years	3-25 years	3-10 years		
Historical Cost[1]						
Beginning of year	$ 566	$ 30,500	$ 88,732	$ 11,414	$ 131,212	$ 125,105
Additions	-	2,841	11,627	1,945	16,413	6,497
Disposals, including write-downs	-	-	(145)	-	(145)	(390)
	566	33,341	100,214	13,359	147,480	131,212
Accumulated Amortization						
Beginning of year	-	16,734	63,498	10,196	90,428	83,570
Amortization expense	-	2,267	4,232	593	7,092	7,248
Effect of disposals, including write-downs	-	-	(64)	-	(64)	(390)
	-	19,001	67,666	10,789	97,456	90,428
Net Book Value at March 31, 2024	$ 566	$ 14,340	$ 32,548	$ 2,570	$ 50,024	
Net Book Value at March 31, 2023	$ 566	$ 13,766	$ 25,234	$ 1,218		$ 40,784

(1) Historical costs includes work-in-progress at March 31, 2024 totaling $7,860 (2023 - $4,051) comprised of building and improvements $1,262 (2023 - $247), equipment $6,598 (2023 - $3,515), and computer software & hardware $nil (2023 - $289).

(2) Buildings and improvements include leasehold improvements (amortized over the life of the lease).

(3) Equipment includes laboratory equipment, heavy equipment, vehicles, office equipment, and other equipment.

Note 14 ACCUMULATED SURPLUS

(in thousands)

	2024			2023
	Investments in Tangible Capital Assets [1]	Unrestricted Surplus	Total	Total
Balance, beginning of year	$ 20,799	$ 9,758	$ 30,557	$ 34,294
Annual surplus (deficit)	(7,173)	20,077	12,903	(3,737)
Net investments in capital assets	16,413	(16,413)	-	-
Transfers to spent deferred capital contributions	(13,772)	13,772	-	-
Spent deferred recognized in revenue	3,405	(3,405)	-	-
Balance, end of year	$ 19,672	$ 23,789	$ 43,460	$ 30,557

(1) The Corporation's closing accumulated surplus invested in tangible capital assets have been reduced by the Corporation's asset retirement obligation of $3,025.

Note 15 CONTINGENT LIABILITIES

(in thousands)

The Corporation is involved in legal matters where damages are being sought. These matters may give rise to contingent liabilities.

Accruals have been made in specific instances where it is likely that losses will be incurred based on a reasonable estimate. As at March 31, 2024 accruals totaling $368 (2023 - $368) have been recognized as a liability.

ALBERTA INNOVATES
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS (Continued)
MARCH 31, 2024

Note 16 CONTRACTUAL OBLIGATIONS

(in thousands)

Contractual obligations are obligations of the Corporation to others that will become liabilities in the future when the terms of those contracts or agreements are met.

	2024	2023
Obligations under operating leases and contracts	$ 133,307	$ 148,236

Estimated payment requirements for each of the next five years and thereafter are as follows:

	Operating leases and contracts
2024-25	$ 78,775
2025-26	37,906
2026-27	11,941
2027-28	4,357
2028-29	188
Thereafter	140
	$ 133,307

Note 17 ALBERTA CARBON CONVERSION TECHNOLOGY CENTRE

(in thousands)

The Alberta Carbon Conversion Technology Centre (ACCTC) is a commercialization and testing centre designed to advance CO2 capture and conversion technologies, and conduct related research. InnoTech Alberta Inc, a wholly owned subsidiary of the Corporation, completed the purchase and transfer of the ACCTC on March 15, 2018. $23,835 (2023 - $23,543) is recorded in tangible capital assets in Note 13. $9,509 (2023 - $11,377) of related spent deferred capital contributions is recorded in Note 10. There were no in-kind contributions received at March 31, 2024 (2023 - $nil).

From June 2018 until March 2021 the ACCTC was the host site for the NRG COSIA Carbon XPRIZE – a competition to pilot various carbon capture and conversion technologies. InnoTech was not directly involved in supervising or overseeing the XPRIZE Competition, aside from its day to day role as the owner and operator of the ACCTC. Now that the XPRIZE competition is over, InnoTech will own and operate the ACCTC, which will be marketed to industry and government as a carbon capture testing site until December 2027. At that time, exclusive use of the site and ownership of the ACCTC will pass back to the owner of the land, who may elect to wholly or partially de-commission the ACCTC. Accordingly, $2,424 (2023 - $2,277) of asset retirement obligations have been recorded in Note 11.

The corporation has entered into various contractual arrangements with respect to ACCTC including a license of occupation, an operating costs recovery agreement, and a repayable contribution agreement. The impact on contractual rights, contractual obligations, contingent assets, and contingent liabilities, when known, has been reflected in these consolidated financial statements in accordance with the accounting policies described in Note 2.

Note 18 COMPARATIVE FIGURES

Certain 2023 figures have been reclassified, where necessary, to conform to the 2024 presentation.

ALBERTA INNOVATES **SCHEDULE 1**
CONSOLIDATED EXPENSES - DETAILED BY OBJECT
YEAR ENDED MARCH 31, 2024

	2024 Budget	2024 Actual	2023 Actual
		(in thousands)	
Grants	$ 139,355	$ 129,083	$ 131,936
Salaries, wages and employee benefits	66,197	68,285	66,780
Supplies and services	38,444	46,374	42,868
Amortization of tangible capital assets (Note 13)	8,900	7,092	7,248
	$ 252,896	$ 250,834	$ 248,832

ALBERTA INNOVATES
SALARY AND BENEFITS DISCLOSURE
YEAR ENDED MARCH 31, 2024
(in thousands)

SCHEDULE 2

	2024				2023
	Base Salary (1)	Other Cash Benefits (2)	Other Non-Cash Benefits (3)	Total	Total
Chair of the Board	$ -	$ 20	$ 1	$ 21	$ 28
Board Members	-	50	2	52	82
Chief Executive Officer	441	122	22	585	737
Executive/Vice Presidents:					
Chief Cleantech Officer & Vice President, Clean Resources	285	11	73	369	359
Chief Operating Officer	313	9	82	404	395
Executive Vice President, Impacts	269	1	68	338	324
General Counsel & Corporate Secretary	263	1	70	334	331
Vice President, Finance (4)	239	25	19	283	225
Vice President, Health	285	30	18	333	313
Vice President, Marketing & Communications	249	26	11	286	257
Associate Vice President, Investments	200	1	41	242	233
	$ 2,544	$ 296	$ 407	$ 3,247	$ 3,284

(1) Base salary includes regular salary.

(2) Other cash benefits include honoraria for the Chair and Board Members. Other cash benefits for the Executive/Vice Presidents include vacation payouts, car and living allowance, payments in lieu of pension, employee health care expense accounts and lump sum amounts.

(3) Other non-cash benefits include employee benefits and contributions or payments made on behalf of employees including pension and supplementary retirement plan, parking, dental coverage, major medical, group life insurance, short term disability plan, CPP, EI, Workers Compensation Board premiums and professional memberships.

(4) Vice President, Finance was effective June 13, 2022.

ALBERTA INNOVATES **SCHEDULE 3**
RELATED PARTY TRANSACTIONS
YEAR ENDED MARCH 31, 2024

Related parties are those entities consolidated or accounted for on the modified equity basis in the Government of Alberta's Consolidated Financial Statements. Related parties also include key management personnel and close family members of those individuals in the Corporation. The Corporation and its employees paid or collected certain taxes and fees set by regulation for premiums, licences and other charges. These amounts were incurred in the normal course of business, reflect charges applicable to all users, and have been excluded from this schedule.

The Corporation had the following transactions with related parties recognized in the Consolidated Statement of Operations and the Consolidated Statement of Financial Position at the amount of consideration agreed upon between the related parties.

	Entities in the Ministry		Other Entities Outside of the Ministry	
	2024	2023	2024	2023 (restated)
	(in thousands)			
Revenues				
Grants	$ 201,676	$ 183,353	$ 6,018	$ 7,993
Interest	-	-	3,157	2,378
Other	-	-	1,786	2,137
	$ 201,676	$ 183,353	$ 10,961	$ 12,508
Expenses - Directly Incurred				
Grants	$ -	$ -	$ 54,434	$ 55,878
Other services	-	-	5,630	6,479
	$ -	$ -	$ 60,064	$ 62,357
Receivables from	$ -	$ -	$ 1,045	$ 1,496
Payable to	$ -	$ -	$ 7,075	$ 3,555
Prepaid expenses	$ -	$ -	$ 25	$ -
Unspent deferred capital contributions	$ 570	$ 985	$ -	$ -
Spent deferred capital contributions	$ 16,991	$ 13,120	$ 70	$ 88
Deferred revenue	$ 35,578	$ 50,557	$ 3,776	$ 7,533
Deferred contract revenue	$ -	$ -	$ 326	$ 100
Contractual obligations	$ -	$ -	$ 53,324	$ 57,109
Contractual rights	$ 39,300	$ 60,500	$ 3,574	$ 2,523

Schedule 3 - Related Party Transactions (Continued)

The above transactions do not include support service arrangement transactions disclosed below. The Corporation also had the following transactions with related parties for which no consideration was exchanged. The amounts for these related party transactions are estimated based on the costs incurred by the service provider to provide the service. These amounts are not reported in the consolidated financial statements. Accommodation expenses incurred by others are disclosed in Schedule 4.

	Other Entities Outside of the Ministry	
	2024	2023
	(in thousands)	
Expenses - Incurred by others [1]		
Accommodation [2]	$ 22,311	$ 21,976
	$ 22,311	$ 21,976

[1] During the year, the Corporation received financial processing and reporting services from Service Alberta and the Department of Technology and Innovation at no cost. The dollar value of these services cannot be accurately determined.

[2] The Corporation's share of accommodation costs is based on the proportion of space occupied compared to the total space occupied by all Ministries.

ALBERTA INNOVATES **SCHEDULE 4**
CONSOLIDATED ALLOCATED COSTS
YEAR ENDED MARCH 31, 2024

	2024			2023
		Expenses - Incurred by Others		
Program	**Expenses[(1)]**	**Accommodation Costs**	**Total Expenses**	**Total Expenses**
		(in thousands)		
Research, innovation and commercialization	$ 155,416	$ -	$ 155,416	$ 155,500
Applied research	53,536	-	53,536	54,920
Administration	34,790	22,311	57,101	53,140
Amortization	7,092	-	7,092	7,248
	$ 250,834	$ 22,311	$ 273,145	$ 270,808

(1) Expenses - Directly Incurred as per Consolidated Statement of Operations.

ALBERTA INNOVATES

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Maple Lodge Farms Limited *Appellant*;

and

Government of Canada and the Minister of Economic Development, responsible for Industry, Trade and Commerce *Respondents*;

and

Canadian Chicken Marketing Agency *Intervener.*

File No.: 16266.

1981: November 4; 1982: July 22.

Present: Laskin C.J. and Ritchie, Estey, McIntyre and Chouinard JJ.

ON APPEAL FROM THE FEDERAL COURT OF APPEAL

Administrative law — Discretion — Import permits required by statute for goods on import control list — Guidelines issued dealing with conditions for import — Whether or not Minister had discretion to deny permits — Whether or not discretion properly exercised — Export and Import Permits Act, R.S.C. 1970, c. E-17, s. 8.

The Minister of Industry, Trade and Commerce refused to issue appellant a permit as required by s. 8 of the *Export and Import Permits Act*, to import a product included on an import control list, notwithstanding the ministerial guidelines dealing with the matter. Appellant questioned whether or not the Minister had any discretion to refuse to issue such a permit, and argued that, if he did, that discretion had been unlawfully exercised. The Federal Court, Trial Division, denied appellant's application seeking a writ of mandamus ordering the Minister to issue the permit sought and the Federal Court of Appeal upheld that decision.

Held: The appeal should be dismissed.

The Minister can properly and lawfully formulate general requirements for the granting of import permits, but these guidelines cannot confine the discretion accorded him under s. 8 of the Act. Here, the Minister properly exercised that discretion. Considerations relating to the amount of available dressed chicken and over-all market conditions were very relevant to his

Maple Lodge Farms Limited *Appelante*;

et

Le gouvernement du Canada et le ministre au Développement économique chargé de l'Industrie et du Commerce *Intimés*;

et

Office canadien de commercialisation des poulets *Intervenant.*

N° du greffe: 16266.

1981: 4 novembre; 1982: 22 juillet.

Présents: Le juge en chef Laskin et les juges Ritchie, Estey, McIntyre et Chouinard.

EN APPEL DE LA COUR D'APPEL FÉDÉRALE

Droit administratif — Pouvoir discrétionnaire — Licences d'importation exigées par la loi pour les marchandises sur la liste des importations contrôlées — Lignes directrices sur les conditions d'importation — Le Ministre a-t-il le pouvoir discrétionnaire de refuser les licences? — Si oui, le pouvoir discrétionnaire a-t-il été régulièrement exercé? — Loi sur les licences d'exportation et d'importation, S.R.C. 1970, chap. E-17, art. 8.

Le ministre de l'Industrie et du Commerce a refusé de délivrer à l'appelante une licence, requise en vertu de l'art. 8 de la *Loi sur les licences d'exportation et d'importation*, pour l'importation d'une marchandise qui figure sur une liste de marchandises d'importation contrôlée, malgré l'existence de lignes directrices qui portent sur le sujet. L'appelante a mis en doute l'existence du pouvoir discrétionnaire du Ministre de refuser une licence et a soutenu que, s'il l'avait, ce pouvoir discrétionnaire n'avait pas été exercé conformément à la loi. La Division de première instance de la Cour fédérale a rejeté la demande de l'appelante visant à obtenir un bref de *mandamus* qui ordonne au Ministre de délivrer la licence demandée et la Cour d'appel fédérale a confirmé cette décision.

Arrêt: Le pourvoi est rejeté.

Le Ministre peut, en vertu de la loi, formuler des conditions générales touchant l'octroi de licences d'importation, mais ces lignes directrices ne peuvent pas restreindre le pouvoir discrétionnaire que l'art. 8 de la Loi lui confère. En l'espèce, le Ministre a exercé ce pouvoir discrétionnaire conformément à la loi. Les questions relatives à la quantité de poulet éviscéré disponible

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decision to refuse to grant appellants the supplementary import permits they sought.

APPEAL from a judgment of the Federal Court of Appeal, [1981] 1 F.C. 500, 114 D.L.R. (3d) 634, 42 N.R. 312, dismissing an appeal from a judgment of Dubé J. dismissing an application for mandamus. Appeal dismissed.

D. K. Laidlaw, Q.C., and *Alan J. Lenczner*, for the appellant.

W. A. Hobson, Q.C., and *R. P. Hynes*, for the respondents.

François Lemieux, for the intervener the Canadian Chicken Marketing Agency.

The judgment of the Court was delivered by

McINTYRE J.—This appeal arises out of the refusal of the Minister of Economic Development, responsible for Industry, Trade and Commerce of the Government of Canada, (the Minister) to issue to the appellant certain supplementary import permits under s. 8 of the *Export and Import Permits Act*, R.S.C. 1970, c. E-17, and Regulations passed thereunder. The permits sought would allow the appellant to import live chickens, having a weight of less than five pounds per chicken, which are in the submission of the appellant essential to the continued operation of its business. Upon the refusal of the Minister, the appellant applied to the Federal Court, Trial Division, for a writ of mandamus ordering the Minister to issue the import permits for the importation of four million pounds of live chicken. The motion was dismissed. An appeal was taken to the Federal Court of Appeal (Heald and Le Dain JJ. and MacKay D.J.) where it was dismissed for reasons written by Le Dain J., for the unanimous court. This appeal is by leave, granted November 3, 1980.

The judgment of Le Dain J. is now reported at [1981] 1 F.C. 500. It sets out the facts and statutory provisions involved in a determination of this case, and it deals with all the issues raised. I am in agreement with the disposition made of this appeal in the Federal Court of Appeal and with

et aux conditions générales du marché sont très pertinentes relativement à sa décision de refuser les licences supplémentaires d'importation.

POURVOI contre un arrêt de la Cour d'appel fédérale, [1981] 1 C.F. 500, 114 D.L.R. (3d) 634, 42 N.R. 312, lequel rejette l'appel interjeté contre le jugement du juge Dubé de rejeter la demande de *mandamus*. Pourvoi rejeté.

D. K. Laidlaw, c.r., et *Alan J. Lenczner*, pour l'appelante.

W. A. Hobson, c.r., et *R. P. Hynes*, pour les intimés.

François Lemieux, pour l'intervenant l'Office canadien de commercialisation des poulets.

Version française du jugement de la Cour rendu par

LE JUGE McINTYRE—Le présent pourvoi découle du refus du ministre au Développement économique chargé de l'Industrie et du Commerce du gouvernement du Canada (le Ministre) de délivrer à l'appelante certaines licences supplémentaires d'importation en application de l'art. 8 de la *Loi sur les licences d'exportation et d'importation*, S.R.C. 1970, chap. E-17, et ses règlements d'application. Les licences demandées permettraient à l'appelante d'importer des poulets vivants pesant moins de cinq livres chacun, importation que l'appelante prétend essentielle à la continuation de son activité. Après le refus du Ministre, l'appelante a demandé à la Division de première instance de la Cour fédérale, un bref de *mandamus* qui ordonne au Ministre de délivrer les licences d'importation pour quatre millions de livres de poulets vivants. Sa requête a été rejetée. La Cour d'appel fédérale (les juges Heald et Le Dain et le juge suppléant MacKay) a rejeté à l'unanimité l'appel interjeté par l'appelante, pour les motifs rédigés par le juge Le Dain. L'autorisation d'appeler à cette Cour a été accordée le 3 novembre 1980.

Les motifs du juge Le Dain sont maintenant publiés à [1981] 1 C.F. 500. Ils énoncent les faits et citent les textes de lois utiles à la décision de l'affaire et ils abordent tous les moyens invoqués. Je suis d'accord avec la façon dont la Cour d'appel fédérale a disposé de cet appel et avec les motifs

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the reasons of Le Dain J., which I would adopt in their entirety. The remarks which follow are intended to supplement, and not to qualify, those reasons.

The appellant argued in this Court that the questions in issue on this appeal were whether the Minister has any discretion respecting the issue of permits under the *Export and Import Permits Act* and Regulations and, if such a discretion is found to exist, whether it was exercised according to law in this case when the permits applied for by the appellant were refused.

It was contended that the power to add chicken to the list of controlled products, established under s. 5 of the *Export and Import Permits Act*, and all powers to make regulations regarding the terms and conditions under which import permits could be issued were reserved exclusively to the Governor in Council. The Minister's function was, accordingly, limited to a purely administrative role and he was obliged to issue permits when the conditions set by the Governor in Council were met. The policy statements referred to by Le Dain J. were then no more than an aid to the Minister in deciding whether a product sought to be imported could be obtained from a domestic source. If, however, any discretion existed, it was argued that it had been wrongly exercised when the permits were refused on the basis that eviscerated chicken was available in Canada. Furthermore, it was said that the issue of the permits could not be contrary to the marketing scheme since, when no chicken was available from Canadian sources, there was no local source of supply to protect.

In my opinion, the role of the Minister may not be so restricted. The word 'may' is used in s. 8 of the Act and there is nothing in the context which would give it other than the permissive meaning ascribed to it in s. 28 of the *Interpretation Act*. I agree with and adopt the words of Le Dain J. in dealing with this argument, at pp. 508-10, where he said:

du juge Le Dain que je suis d'avis d'adopter en tous points. Les observations qui suivent visent plutôt à compléter ces motifs qu'à les nuancer.

L'appelante a soutenu en cette Cour que les questions posées par le présent pourvoi sont celles de savoir si le Ministre jouit d'un pouvoir discrétionnaire en matière de délivrance de licences en vertu de la *Loi sur les licences d'exportation et d'importation* et des règlements et, si cette Cour conclut à l'existence d'un tel pouvoir discrétionnaire, son exercice a-t-il été conforme à la loi lorsque les licences demandées par l'appelante ont été refusées?

On a soutenu que le pouvoir d'ajouter le poulet à la liste des produits sous contrôle établie en vertu de l'art. 5 de la *Loi sur les licences d'exportation et d'importation* et tous les pouvoirs d'établir des règlements relatifs aux conditions de délivrance des permis d'importation sont exclusivement réservés au gouverneur en conseil. En conséquence, le rôle du Ministre se limiterait à l'aspect purement administratif et celui-ci serait tenu de délivrer les licences lorsque les conditions énoncées par le gouverneur en conseil sont remplies. Les énoncés de politique mentionnés par le juge Le Dain ne seraient rien de plus que des indications qui aideraient le Ministre à décider si un produit dont on demande l'importation peut être acheté sur le marché domestique. Si toutefois il existe un pouvoir discrétionnaire, on soutient qu'il a été mal exercé, car les licences ont été refusées parce qu'on pouvait se procurer du poulet éviscéré au Canada. De plus on a soutenu que la délivrance de licences ne pouvait pas être contraire au plan de commercialisation puisque lorsqu'on ne peut pas se procurer de poulet auprès de sources canadiennes, il n'y a pas de source intérieure d'approvisionnement à protéger.

A mon avis, on ne peut restreindre ainsi le rôle du Ministre. C'est le mot «peut» qui est employé à l'art. 8 de la Loi et il n'y a rien dans le contexte qui permette de lui donner un autre sens que celui qui exprime une faculté, sens que lui donne l'art. 28 de la *Loi d'interprétation*. Je reprends l'énoncé du juge Le Dain, auquel je souscris, énoncé qui dispose comme suit de cet argument aux pp. 508 à 510:

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Looking at these provisions as a whole, I am of the opinion that section 8 of the Act confers upon the Minister a discretion as to whether or not to issue an import permit in a particular case. Section 28 of the *Interpretation Act*, R.S.C. 1970, c. I-23, requires, of course, that the word "may" in section 8 be construed as permissive unless the context indicates a contrary intention. See *McHugh v. Union Bank of Canada* [1913] A.C. (P.C.) 299; *Smith & Rhuland Limited v. The Queen, on the relation of Brice Andrews* [1953] 2 S.C.R. 95. This is not a case for application of the principle recognized in *Julius v. The Right Rev. the Lord Bishop of Oxford* (1879-80) 5 App. Cas. 214 and referred to in *The Labour Relations Board of Saskatchewan v. The Queen on the relation of F. W. Woolworth Co. Ltd.* [1956] S.C.R. 82 at page 87, that permissive words may be construed as creating a duty where they confer a power the exercise of which is necessary to effectuate a right. The *Export and Import Permits Act* does not create or recognize a legal right to an import permit. Chicken was placed on the Import Control List, pursuant to section 5(1)(*a*.1) of the Act for the purpose of restricting its importation to support action taken under the *Farm Products Marketing Agencies Act*, S.C. 1970-71-72, c. 65. As I have said, the effect of its inclusion in the List is, by section 14 of the Act, to prohibit its importation "except under the authority of an in accordance with an import permit issued under this Act." The common law right to import goods is to that extent abrogated. It is an implication of section 5 (1)(*a*.1) of the Act that the Minister is to exercise his authority to issue or refuse permits for the purpose specified therein. It cannot have been intended, in view of this declared purpose, that the power to issue permits should be a mere Ministerial duty imposed for the sole purpose of monitoring the extent to which an unlimited right of importation is in fact exercised.

The words in section 8, "in such quantity and of such quality, by such persons, from such places or persons and subject to such other terms and conditions as are described in the permit or in the regulations", do not refer to conditions defining a right or entitlement to a permit but to the terms and conditions to which an issued permit may be subject. This is clear from the terms of section 12(*a*) of the Act, which, in conferring the power to make regulations, speaks, *inter alia*, of "the terms and conditions, including those with reference to shipping or other documents, upon which permits, cer-

J'estime qu'il ressort de ces dispositions prises dans leur ensemble que l'article 8 de la *Loi* accorde au Ministre un pouvoir discrétionnaire de délivrer ou de ne pas délivrer une licence d'importation dans un cas donné. L'article 28 de la *Loi d'interprétation*, S.R.C. 1970, c. I-23, exige évidemment que le mot «peut» de l'article s'interprète comme exprimant une faculté à moins que le contexte ne manifeste une intention contraire. Voir les affaires *McHugh c. Union Bank of Canada* [1913] A.C. (C.P.) 299; *Smith & Rhuland Limited c. La Reine ex rel. Brice Andrews* [1953] 2 R.C.S. 95. La présente affaire ne donne pas lieu à l'application du principe reconnu dans l'affaire *Julius c. The Right Rev. the Lord Bishop of Oxford* (1879-80) 5 App. Cas. 214, et mentionné dans l'affaire *The Labour Relations Board of Saskatchewan c. La Reine ex rel. F.W. Woolworth Co. Ltd.* [1956] R.C.S. 82, à la page 87, selon lequel des termes accordant une faculté peuvent s'interpréter comme créant un devoir s'ils confèrent un pouvoir dont l'exercice est nécessaire pour donner effet à un droit. La *Loi sur les licences d'exportation et d'importation* ne crée ni ne reconnait de droit strict à une licence d'importation. Le poulet a été ajouté à la liste de marchandises d'importation contrôlée en vertu de l'article 5(1)*a*.1) de la Loi dans le but d'en restreindre l'importation afin d'appuyer une mesure prise en vertu de la *Loi sur les offices de commercialisation des produits de ferme*, S.C. 1970-71-72, c. 65. Comme je l'ai déjà mentionné, l'inscription du poulet sur la liste a pour effet, en vertu de l'article 14 de la Loi, d'en interdire l'importation «si ce n'est sous l'autorité et en conformité d'une licence d'importation délivrée selon la présente loi». Le droit général d'importer des marchandises est abrogé d'autant. Il découle de l'article 5(1)*a*.1) que le Ministre doit exercer le pouvoir qui lui est confié de délivrer ou de refuser des licences pour les fins qui y sont mentionnées. Il est impossible, étant donné l'objet qui y est exprimé, que le législateur ait voulu que l'autorité de délivrer des licences soit simplement une obligation imposée au Ministre dans le seul but de lui permettre de vérifier dans quelle mesure un droit illimité d'importer est effectivement exercé.

Les mots de l'article 8 («en la quantité et de la qualité, par les personnes, des endroits ou des personnes et sous réserve des autres stipulations et conditions que décrivent la licence ou les règlements») ne visent pas les conditions dont dépendrait le droit d'exiger une licence, mais les conditions auxquelles une licence peut être assujettie une fois délivrée. Cela ressort clairement des termes de l'article 12*a*) de la Loi qui, en établissant le pouvoir de prendre des règlements, parle notamment des «conditions, y compris celles qui concernent les documents d'expédition ou autres, auxquelles des licences,

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tificates or other authorizations may be issued or granted under this Act." Further, section 3 of the *Import Permit Regulations*, which prescribes the information to be furnished by applicants for permits, could not by implication create a right to a permit upon the simple fulfilment of this requirement. The Regulation imposes a requirement upon an applicant for a permit; it does not create, expressly or impliedly, a duty to issue a permit upon the fulfilment of this requirement. The information simply forms part of the basis on which the Minister is to exercise his discretion whether or not to issue a permit, and if so, upon what terms and conditions. The authority conferred by section 12 of the Act to make regulations respecting certain matters affecting import permits is not inconsistent with a discretionary authority in the Minister to issue or to refuse to issue a permit, although needless to say, in the exercise of his discretion he must conform to the Regulations. There is nothing in the terms of section 12, which empowers the Governor in Council to lay down certain requirements affecting permits, to suggest that it was intended to confer authority to determine the conditions upon the fulfilment of which every applicant would be entitled to a permit. The permit which the Minister may issue pursuant to section 8 is certainly subject to the terms and conditions imposed by the Regulations but that is a different thing from conditions which qualify or eliminate altogether his discretion as to whether to grant a permit at all. In conclusion, it is my opinion that section 8 confers a discretionary authority to issue import permits and does not create a duty to issue them upon the fulfilment of certain conditions.

It is clear, then, in my view, that the Minister has been accorded a discretion under s. 8 of the Act. The fact that the Minister in his policy guidelines issued in the Notice to Importers employed the words: "If Canadian product is not offered at the market price, a permit will normally be issued; . . . " does not fetter the exercise of that discretion. The discretion is given by the Statute and the formulation and adoption of general policy guidelines cannot confine it. There is nothing improper or unlawful for the Minister charged with responsibility for the administration of the general scheme provided for in the Act and Regulations to formulate and to state general requirements for the granting of import permits. It will be

certificats ou autres autorisations peuvent être délivrés ou concédés sous le régime de la présente loi». De plus, l'article 3 du *Règlement sur les licences d'importation*, qui précise les renseignements que doit fournir celui qui sollicite l'octroi d'une licence, ne peut créer implicitement un droit à une licence qui résulterait du seul fait d'avoir rempli les formalités prévues. Le Règlement impose des exigences à l'auteur d'une demande de licence; il ne crée ni expressément ni tacitement d'obligation de délivrer la licence dès que ces exigences sont remplies. Les renseignements servent simplement à fournir une pratique du fondement à partir duquel le Ministre exercera son pouvoir discrétionnaire de délivrer ou non une licence et, s'il en délivre une, de déterminer les conditions auxquelles celle-ci sera assujettie. Le pouvoir accordé par l'article 12 de la Loi d'établir des règlements quant à certains sujets touchant les licences d'importation n'est pas incompatible avec l'attribution au Ministre d'un pouvoir discrétionnaire de délivrer ou de refuser de délivrer une licence, bien qu'il doive évidemment se conformer au Règlement dans l'exercice de ce pouvoir. Il n'y a rien dans les termes de l'article 12, lequel article autorise le gouverneur en conseil à déterminer les exigences touchant les licences, qui donne à penser qu'on ait simplement entendu donner le pouvoir de déterminer des conditions qu'il suffirait au requérant de remplir pour avoir droit à une licence. La licence que le Ministre peut délivrer en vertu de l'article 8 est certainement sujette aux conditions prescrites par le Règlement, mais il ne s'agit pas là de conditions qui diminuent ou suppriment complètement le pouvoir discrétionnaire qu'il a d'accorder une licence. En conclusion, j'estime que l'article 8 confère un pouvoir discrétionnaire de délivrer des licences d'importation et qu'il ne crée pas d'obligation de les délivrer du seul fait que les conditions fixées sont remplies.

Il est donc manifeste, à mon avis, que l'art. 8 de la Loi accorde un pouvoir discrétionnaire au Ministre. Le fait que le Ministre ait employé dans ses lignes directrices contenues dans l'avis aux importateurs les mots: «Si le produit canadien n'est pas offert au prix du marché, une licence est émise . . . » n'entrave pas l'exercice de ce pouvoir discrétionnaire. C'est la Loi qui accorde le pouvoir discrétionnaire et la formulation et l'adoption de lignes directrices générales ne peut le restreindre. Il n'y a rien d'illégal ou d'anormal à ce que le Ministre chargé d'appliquer le plan général établi par la Loi et les règlements formule et publie des conditions générales de délivrance de licences d'importation. Il est utile que les demandeurs de

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helpful to applicants for permits to know in general terms what the policy and practice of the Minister will be. To give the guidelines the effect contended for by the appellant would be to elevate ministerial directions to the level of law and fetter the Minister in the exercise of his discretion. Le Dain J. dealt with this question at some length and said, at p. 513:

> The Minister may validly and properly indicate the kind of considerations by which he will be guided as a general rule in the exercise of his discretion (see *British Oxygen Co. Ltd. v. Minister of Technology* [1971] A.C. (H.L.) 610; *Capital Cities Communications Inc. v. Canadian Radio-Television Commission* [1978] 2 S.C.R. 141, at pp. 169-171), but he cannot fetter his discretion by treating the guidelines as binding upon him and excluding other valid or relevant reasons for the exercise of his discretion (see *Re Hopedale Developments Ltd. and Town of Oakville* [1965] 1 O.R. 259).

> In any case, the words employed in s. 8 do not necessarily fetter the discretion. The use of the expression "a permit will normally be issued" is by no means equivalent to the words 'a permit will necessarily be issued'. They impose no requirement for the issue of a permit.

> In construing statutes such as those under consideration in this appeal, which provide for far-reaching and frequently complicated administrative schemes, the judicial approach should be to endeavour within the scope of the legislation to give effect to its provisions so that the administrative agencies created may function effectively, as the legislation intended. In my view, in dealing with legislation of this nature, the courts should, wherever possible, avoid a narrow, technical construction, and endeavour to make effective the legislative intent as applied to the administrative scheme involved. It is, as well, a clearly-established rule that the courts should not interfere with the exercise of a discretion by a statutory authority merely because the court might have exercised the discretion in a different manner had it been charged with that responsibility. Where the statutory discretion has been exercised in good faith and, where required, in accordance with the principles of natural justice, and where reliance has not

licences connaissent les grandes lignes de la politique et de la pratique que le Ministre entend suivre. Donner aux lignes directrices la portée que l'appelante allègue qu'elles ont équivaudrait à attribuer un caractère législatif aux directives ministérielles et entraverait l'exercice du pouvoir discrétionnaire du Ministre. Le judge Le Dain a analysé cette question et dit, à la p. 513:

> Le Ministre est libre d'indiquer le type de considérations qui, de façon générale, le guideront dans l'exercice de son pouvoir discrétionnaire (voir *British Oxygen Co. Ltd. c. Minister of Technology* [1971] A.C. (C.L.) 610; *Capital Cities Communications Inc. c. Le Conseil de la Radio-Télévision canadienne* [1978] 2 R.C.S. 141, aux pp. 169 à 171), mais il ne peut pas entraver ce pouvoir discrétionnaire en tenant les lignes directrices pour obligatoires et en excluant tous les autres motifs valides ou pertinents pour lesquels il peut exercer son pouvoir discrétionnaire (voir *Re Hopedale Developments Ltd. and Town of Oakville* [1965] 1 O.R. 259).

> De toute façon, les termes employés dans l'art. 8 n'entravent pas nécessairement l'exercice du pouvoir discrétionnaire. L'expression «une licence est émise» n'est absolument pas équivalente à «une licence est nécessairement émise». Ces termes n'imposent pas de condition à la délivrance d'une licence.

> En interprétant des lois semblables à celles qui sont visées en l'espèce et qui mettent en place des arrangements administratifs souvent compliqués et importants, les tribunaux devraient, pour autant que les textes législatifs le permettent, donner effet à ces dispositions de manière à permettre aux organismes administratifs ainsi créés de fonctionner efficacement comme les textes le veulent. A mon avis, lorsqu'elles examinent des textes de ce genre, les cours devraient, si c'est possible, éviter les interprétations strictes et formalistes et essayer de donner effet à l'intention du législateur appliquée à l'arrangement administratif en cause. C'est aussi une règle bien établie que les cours ne doivent pas s'ingérer dans l'exercice qu'un organisme désigné par la loi fait d'un pouvoir discrétionnaire simplement parce que la cour aurait exercé ce pouvoir différemment si la responsabilité lui en avait incombé. Lorsque le pouvoir discrétionnaire accordé par la loi a été exercé de bonne foi et, si nécessaire, conformément aux principes de justice

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been placed upon considerations irrelevant or extraneous to the statutory purpose, the courts should not interfere. This approach has been followed by Le Dain J. and I accept and adopt his words, at p. 514, where, though he had earlier noted that the appellant's view of the policy guidelines was not unreasonable, he said:

> In the present case the Minister, acting through the Office of Special Import Policy, appears to have adopted, as the reason for refusing the supplementary import permits sought by the appellant, the considerations which are disclosed in the passages quoted above from the letters of the Agency to the appellant. These considerations relate to the quantity of eviscerated chicken available and the over-all requirements of the market. Having regard to the terms of section 5(1)(*a*.1) of the *Export and Import Permits Act* and the description or definition of the product in Item 19 of the Import Control List, the proclamation establishing the Agency, and the *Canadian Chicken Marketing Quota Regulations*, I am unable to conclude that these considerations are clearly extraneous or irrelevant to the statutory purpose for which chicken was placed on the Import Control List and to which the exercise of the Minister's discretion must be related.

I would therefore dismiss the appeal with costs.

Appeal dismissed with costs.

Solicitors for the appellant: McCarthy & McCarthy, Toronto.

Solicitor for the respondents: R. Tassé, Ottawa.

naturelle, si on ne s'est pas fondé sur des considérations inappropriées ou étrangères à l'objet de la loi, les cours ne devraient pas modifier la décision. C'est le point de vue adopté par le juge Le Dain; j'accepte et j'adopte le passage de la p. 514 où, tout en ayant souligné plus tôt que l'interprétation des lignes directrices par l'appelante n'était pas déraisonnable, il dit:

> Dans la présente affaire, le Ministre, agissant par l'entremise de la Direction générale de la politique sur l'importation de certains produits, paraît avoir fondé son refus d'accorder à l'appelante les licences d'importation supplémentaires demandées sur les considérations mentionnées dans les extraits cités plus haut des lettres de l'Office à l'appelante. Ces considérations portent sur la quantité du poulet éviscéré disponible et sur les besoins de l'ensemble du marché. Compte tenu des termes de l'article 5(1)*a*.1) de la *Loi sur les licences d'exportation et d'importation*, de la définition ou description donnée du produit au numéro 19 de la liste de marchandises d'importation contrôlée, à la proclamation créant l'Office et au *Règlement canadien sur le contingentement de la commercialisation des poulets*, je ne puis conclure que ces considérations sont manifestement inappropriées ou étrangères à l'objet légal pour lequel le poulet a été ajouté à la liste de marchandises d'importation contrôlée et auquel l'exercice du pouvoir discrétionnaire du Ministre doit être rattaché.

Je suis donc d'avis de rejeter le pourvoi avec dépens.

Pourvoi rejeté avec dépens.

Procureurs de l'appelante: McCarthy & McCarthy, Toronto.

Procureur des intimés: R. Tassé, Ottawa.

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