



# HEALTHY ANIMALS, HEALTHY CANADA

## Executive Summary



Council of Canadian Academies  
Conseil des académies canadiennes

**HEALTHY ANIMALS, HEALTHY CANADA**

**The Expert Panel on Approaches to Animal Health  
Risk Assessment**

## THE COUNCIL OF CANADIAN ACADEMIES

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This report was prepared for the Government of Canada in response to a request from the Minister of Agriculture and Agri-Food, on behalf of the Canadian Food and Inspection Agency, via the Minister of Industry. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the authors, the Expert Panel on Approaches to Animal Health Risk Assessment, and do not necessarily represent the views of their organizations of affiliation or employment.

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## Acknowledgements

The Expert Panel on Approaches to Animal Health Risk Assessment (the Panel) was established in response to a request from the federal Minister of Agriculture and Agri-Food, on behalf of the Canadian Food Inspection Agency (CFIA), who asked the Council of Canadian Academies to assess the state and comprehensiveness of risk assessment techniques in animal health science, specifically pertaining to risks that may impact human health.

During the course of its deliberations, the Panel sought assistance from many people and organizations that provided valuable information and advice. A full list of the invited speakers is provided in Appendix A. The Panel would like to thank these speakers; the respondents to the Animal Health Risk Assessment Researchers, Surveillance Organizations, and Training Trends surveys; and the risk assessors, risk managers, and other CFIA staff who met with the Panel at the outset of the assessment to inform the deliberative process. We would also like to thank Nancy Rheault (CFIA) for her support in coordinating the Panel's meetings with CFIA staff.



Alastair Cribb, Chair  
Expert Panel on Approaches to Animal Health Risk Assessment

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## Report Review

This report was reviewed in draft form by the individuals listed below — a group of reviewers selected by the Council of Canadian Academies for their diverse perspectives; areas of expertise; and broad representation of academic, industrial, policy, and non-governmental organizations.

The reviewers assessed the objectivity and quality of the report. Their submissions, which will remain confidential, were considered fully by the Panel, and many of their suggestions were incorporated into the report. They were not asked to endorse the conclusions nor did they see the final draft of the report before its release. Responsibility for the final content of this report rests entirely with the authoring Panel and the Council.

The Council wishes to thank the following individuals for their review of this report:

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The report review procedure was monitored on behalf of the Council's Board of Governors and Scientific Advisory Committee (SAC) by Dr. Michel G. Bergeron FCAHS, Director, Division of Microbiology and the Centre de recherche en infectiologie, Université Laval. The role of the report review monitor is to ensure that the panel gives full and fair consideration to the submissions of the

report reviewers. The Board of the Council authorizes public release of an expert panel report only after the report review monitor confirms that the Council's report review requirements have been satisfied. The Council thanks Dr. Bergeron for his diligent contribution as review monitor.

A handwritten signature in black ink, reading "Elizabeth Dowdeswell". The signature is written in a cursive style with a large initial "E".

Elizabeth Dowdeswell, President and CEO  
Council of Canadian Academies

## Executive Summary

Animals are integral to Canadian culture and society, to our economic well-being, and, in many ways, to our health. The direct and indirect links between animal health and human health have become more apparent over the last decade with a greater appreciation of emerging and re-emerging diseases. The pandemic H1N1 influenza virus in 2009 provides one recent example. Identifying, assessing, and managing risks to the health of our animal populations serves to protect not only the economic benefits derived from animals, but also the health of individuals, populations, our society, our domestic and wild animals, and our ecosystems.

Risk assessment is employed by all levels of government, by industry organizations, and informally by individuals, to solve problems and aid in decision-making. Formal risk assessment is a structured, systematic process to determine the likelihood of the occurrence of an event and the likely magnitude of the consequences following exposure to a hazard. Because animal health risk assessment occurs within the context of international agreements, stakeholder expectations, and/or complex socio-political considerations, a structured, systematic approach is needed to help ensure it contributes to decision-making in a meaningful way.

The context and demands of, and for, animal health risk assessment are changing. Emerging disease and food safety are a greater part of the public consciousness. We are in an era of rapid travel and communication. The impact of globalization and urban expansion on animal and human health is only now beginning to be understood. Climate change is affecting disease spread and disease range. Societal expectations and our knowledge base are changing. Therefore, the Minister of Agriculture and Agri-Food, on behalf of the Canadian Food Inspection Agency (CFIA), asked the Council of Canadian Academies to assemble a panel of experts to address the following question:

*What is the state and comprehensiveness of risk assessment techniques in animal health science, specifically pertaining to risks which may impact human health?*

The Expert Panel on Approaches to Animal Health Risk Assessment (the Panel) examined the practices of Canadian agencies and institutions engaged in risk assessment in animal health and other areas, and of Canada's major international trading partners. The Panel also reviewed the available literature on risk assessment and the views of experts in the area, and conducted its own surveys and reviews on the state of animal health risk assessment in Canada.

The Panel recognized that the drivers of animal health risk assessments range from relatively routine animal import requests to requests for assessments to help establish overarching policy directions. The context and constraints (e.g., the need to comply with international agreements) for risk assessments may vary; however, there are some useful general approaches that can and are being applied to animal health risk assessments conducted for this range of purposes.

## THE FINDINGS

The Panel's major finding was that an integrated, multidimensional approach that considers the appropriate range of potential animal, human, and environmental consequences, as well as risk management outcomes, in the risk assessment process would contribute to assessments that provide increased value to risk managers, decision-makers, and stakeholders. Further, risk-based decision-making and subsequent risk communication and management could benefit from a greater engagement of stakeholders in establishing risk assessment questions, scope, and consequences, and from improved access to expertise and knowledge among risk assessment practitioners. Because risk assessment is part of a broader risk analysis process that comprises hazard identification, risk assessment, risk communication, and risk management, all four phases need to be effectively carried out to maximize the benefits of the risk assessment component.

Animal health risk assessment in Canada is built on a solid foundation of knowledge and expertise. Although other organizations are involved, the CFIA plays a major role in carrying out animal health risk assessments in Canada. The CFIA conducts systematic risk assessments within a structured risk analysis framework that is consistent with international guidelines. Many of these risk assessments are carried out for the purposes of international trade, most often related to importation requests. The majority of risk assessments conducted are qualitative and, while they may consider a range of consequences, the major focus is on the economic and trade consequences of introducing animal disease into Canada. In reviewing risk assessments from other countries, the Panel observed that several countries were taking a broader view of the consequences of animal health events.

The Panel noted a number of gaps in the knowledge required to conduct specific risk assessments, but these deficits in knowledge and/or data were generally specific to the hazard or importation in question. A coordinated approach to address animal-human health risk research to support such risk assessment does

not exist in Canada. Enhanced training and research are required to support animal health risk assessments. The Panel observed that dedicated funding sources and organizations were being utilized in other jurisdictions to address this issue.

The Panel further concluded that integrating human health and environmental consequences into animal health risk assessments would improve their applicability and utility in risk analysis and risk-based decision-making. While the Panel recognized that not all risk assessments need be comprehensive in their consideration of consequences, the integration of consequences into a comprehensive risk assessment, as opposed to the completion of independent risk assessments for animal and human health, would be most valuable. Additionally, the Panel identified differences in terminology describing the risk assessment process, as well as differences in the cultures of the animal and human health risk assessment communities in Canada, as significant impediments to achieving integration. Therefore, the Panel proposed a standardized use of language and definitions to facilitate communication and shared activities.

The Panel identified several contributions to achieving an integrated, multidimensional approach in animal health risk assessment:

- 1. Integration: increase the breadth and depth of consequences considered in risk assessments; and address consequences for animals, humans, and the environment.**

Many risks to animal health have economic, ecological, and social implications beyond those directly affecting domestic animal health. Consequence identification and selection should be a formal element of animal health risk assessment. A full range of potential consequences (increased breadth) should be identified early in the risk assessment process using input from risk managers, risk assessors, and relevant stakeholders.

Further, secondary or subsequent consequences should be considered (increased depth) as well as immediate, direct consequences. The Panel felt that exploring this breadth and depth of consequences within a single, integrated risk assessment would be more effective than considering different consequences independently. Methodologies and perspectives from more disciplines should be integrated (*interdisciplinarity*, as opposed to multidisciplinary, is the goal) to ensure adequate consideration is given to the consequences.

The Panel is not suggesting that all consequences should be explored in all risk assessments, but rather that there is a conscious consideration of the full breadth and depth of consequences. This should be accompanied by a transparent selection process for determining which consequences to include. This approach would ultimately facilitate risk communication and risk management, and the acceptance of decisions by stakeholders.

**2. Multidimensional approach: include evaluation of consequences of various management options in the assessment.**

Risk assessment is most commonly viewed as a two-dimensional process: the first dimension is the likelihood of a risk occurring, and the second is the severity of the consequences. The Panel considered that the value of risk assessment would be increased by including a third dimension that considers not only the consequences of the hazard or risk, but also the consequences of the risk management or mitigation measures. For example, the consequences of management options, such as vaccination or quarantine, should be analyzed against the impact on animals, humans, and the environment. The element of time should also be included, in that risk estimation may change with time; thus consequences might not be immediate. The Panel felt that it would be valuable to formalize this process as a systematic step in risk assessment. One promising method for achieving this goal is multiple criteria decision analysis, as described in Appendix D. The specific method, however, would be less important than the overarching goal of including multiple interventions and their associated consequences.

**3. Ensure transparency: use risk managers and stakeholders strategically in the risk assessment process, have a structured prioritization process, document decisions, and maximize risk communication.**

Transparency adds value to the risk assessment process and facilitates subsequent risk communication and management. Transparency can be facilitated by recognizing and using the strategic role of risk managers, by having a clear process for *engaging stakeholders* in the risk assessment process, by having a structured prioritization process, and by effective risk communication. Where possible, completed animal health risk assessments should be publicly available. Risk communication is an ongoing activity throughout the risk assessment process. Areas of uncertainty and assumptions should be clearly identified in the risk assessment, particularly so that it is understood when and what assumptions or estimations have been made. Transparency and communication are important throughout the risk assessment and, indeed, the whole risk analysis process.

It may be acceptable to employ a quantitative, qualitative, or a mixed approach to risk assessment, depending on the available supporting data and the goal of the assessment. Quantitative risk assessment may assist with transparency in some cases.

Adoption of an integrated, multidimensional approach is not inconsistent with Canada's obligations to international agreements and guidelines related to animal health risk assessment. The Panel noted that some of our major trading partners or peers (including New Zealand and the European Union) are adopting aspects of this approach. Further, a number of international trading partners have a more transparent process, including public availability of completed risk assessments.

The Panel also viewed the following points to be important for achieving an integrated, multidimensional approach to risk assessment, maximizing the utility of the assessment in risk-based decision-making, and ensuring that the appropriate risk assessments are completed in a timely fashion:

- Risk assessment organizations across the animal-human-environment health spectrum should work to *align and integrate processes*, where appropriate, to ensure efficiency, transparency, communication, integration, and continuity. The conditions for effective, integrated animal-human health risk assessment will be affected by a range of factors such as institutional arrangements and resource constraints.
- A *structured and transparent prioritization system* helps to ensure that routine risk assessments, as well as those required for policy decisions and strategic planning, are completed in a timely fashion.
- Canada's research and training in animal health risk assessment should be enhanced to *strengthen its knowledge capacity* for protecting animal health, human health, and the environment. Canada's current research funding structure does not facilitate integrated animal-human health research.

The Panel recognized that expanding the range of consequences and adopting an integrated, multidimensional approach might require increased, or at least realigned, resources. This could be minimized by ensuring there is not only a structured process for prioritizing the conduct of the risk assessment itself, but also a process for prioritizing the range of consequences and management options considered within a risk assessment. The precise details of these processes are less important than the fact that both should be structured and transparent. It is also important to conduct risk assessments that address future or unknown risks and inform public policy decisions. These risk assessments should be identified as a priority to ensure that resources are directed to them. A variety of strategic

planning processes or foresight analyses can be applied to the prioritization process. Again, the exact process is less important than the fact that a structured process would be considered and conducted.

## **CONCLUSION**

Animal health risk assessment in Canada currently appears to be meeting the majority of our needs with regard to importation and international trade obligations. A more integrated, multidimensional approach, however, like that adopted by some of our peer trading partners, may better serve the broader goals of animal health risk assessment and better support the risk-based decision-making process. Adopting an integrated, multidimensional approach and conducting strategic risk assessments could be resource intensive if not managed properly. Therefore, a systematic, transparent prioritization process, for both the extent and range of risk assessments, needs to be in place. Risk assessment organizations in Canada (e.g., the CFIA, the Public Health Agency of Canada) should work to align and integrate processes to ensure efficiency, transparency, communication, integration, and continuity. A robust and effective risk assessment process to support risk-based decision-making will help to ensure the health of Canada's animal populations and help to protect human health.



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