Preparing for emerging challenges to animal health in Canada

Shane Renwick, Canadian Food Inspection Agency (CFIA)

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A national foresight initiative has produced new tools to help the animal health community in Canada better prepare for future animal disease threats.

Canada is currently free of major transmissible animal diseases that fall under the mandate of the Canadian Food Inspection Agency, including foot-and-mouth disease (FMD) and serious strains of avian influenza. However, there is a critical need for all stakeholders in the animal health community to remain vigilant since such disease outbreaks can cause debilitating sickness in livestock, halt trade in animals and animal products, and threaten the food supply, public health and the livelihoods of farmers.

We need look back only a few years to remind us why we must remain on guard. For example, the outbreak of FMD in Britain in 2001 caused more than $16 billion (CDN) in damage, with millions of animals slaughtered to prevent the virus from spreading; disruption of the food supply, trade and tourism; and severe psychological trauma and loss of livelihood to thousands of people. The outbreak of bovine spongiform encephalopathy in Canada in 2003 has cost the Canadian economy at least $5 billion (CDN). Impacts are still being felt throughout the animal industry nearly ten years later. The 2004 outbreak of highly pathogenic avian influenza in the province of British Columbia, originating from wild birds, caused $300 million (CDN) in damage to the poultry industry before it was finally eradicated, fortunately without serious human illness or loss of life.

Complacency is not an option

Animal diseases do not respect international borders and may appear without warning. Canada cannot be complacent. In today's highly interconnected world, disease-causing agents could enter Canada in a number of ways. Outbreaks might result from natural incursions such as through wildlife or insect movement, or they could occur inadvertently if the virus is carried on contaminated imported products or on international travellers.

Faced with these challenges, the Canadian Food Inspection Agency (CFIA) took the lead in 2008 in developing Foresight for Canadian Animal Health (Fore-CAN), an innovative, three-year (2008-2011) multi-partner initiative that applied foresight methods to support new ways of thinking about the animal health emergency management (AHEM) system. Fore-CAN was launched in response to concerns from the animal health and welfare community that failure to anticipate and prepare for future challenges arising from new, existing or as yet unknown disease threats to healthy animal populations could lead to catastrophic consequences for the health of Canadians and Canada's economy.

Fore-CAN was funded by the Centre for Security Science, National Defence Canada and in-kind contributions of partner organizations, including Agriculture and Agri-Food Canada; Alberta Agriculture and Rural Development; Dairy Farmers of Canada; Health Canada; Ontario Ministry of Agriculture, Food and Rural Affairs; Public Health Agency of Canada, and Canada’s five veterinary colleges. In all there were over 300 participants from the diverse animal health community, including governments, farmers, producers, food processors, aboriginal representatives, wildlife disease experts, veterinarians, scientists, and consumers and governmental and non-governmental organizations in Canada and abroad.\(^2\)

Fore-CAN’s three objectives were aimed at involving the animal health community in:

i) learning about and using foresight methods to gain insights into future threats and opportunities;

ii) applying the resulting insights to guide planning and investments in AHRM capabilities; and,

iii) sharing and transferring knowledge gained in order to enhance the AHEM system in Canada.

In a series of foresight activities, participants explored the following focal question: How can Canada build a more effective and robust animal health emergency system for 2025 and beyond?

Participants followed a stepwise process (Figure 1) that included six foresight activities designed to encourage new ways of thinking and to build trust and understanding:

<table>
<thead>
<tr>
<th>Key Activities</th>
<th>Purpose</th>
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<td>Jan 2009</td>
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<td>1. Horizon Scanning</td>
<td>Identify trends and driving forces and their implications for animal health.</td>
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<td>2. Scenario Development</td>
<td>Challenge participants to consider unique, plausible future operating environments for the risk management system.</td>
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<td>3. Systems Mapping</td>
<td>Capture the current activities, authorities and relationships in order to define a starting point from which a future system could be built.</td>
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<td>4. Integration</td>
<td>Combine learnings from scenarios and systems maps to define a shared vision and develop strategic options for the design of a future system.</td>
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<td>5. Validation</td>
<td>Confirm assumptions and direction through re-engagement of partners.</td>
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<td>6. Roadmap to 2025</td>
<td>Map outcomes in 5 year intervals toward the shared vision for 2025.</td>
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<td>Sep 2011</td>
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**Figure 1. Foresight for Canadian Animal Health (Fore-CAN) activities and timeline**

**Shared vision, shared responsibility**

The convergence of perspectives that emerged from these activities enabled the participants to develop a shared vision for the AHEM system of the future, titled “Healthy Animals, Healthy Future 2025” (Figure 2). The shared vision reflects participants’ acceptance of, and appreciation for, shared responsibility for the AHEM system. The vision also recognizes the inextricable interconnections among the economy, the environment, public health and animal health.

**Animal health will be recognized as a key pillar in the preservation and promotion of Canada’s health and economic prosperity.**

**Canada’s animal health emergency management system will be anticipatory, adaptable and seamlessly integrated with human, economic and ecosystem health systems.**

\(^2\)CBRN Research and Technology Initiative (CRTC) Website: http://www.css.drdc-rddc.gc.ca/crti/index-eng.asp


Tools for turning insight into action

Fore-CAN partners developed the following tools to support future thinking and achieve the shared vision.

1. Plausible future scenarios (Figure 3) were developed to challenge participants’ assumptions, explore issues and broaden shared understanding of a range of future operating environments for AHEM in Canada. The scenario development process considered all of the uncertainties and risks associated with the trends and drivers that had been identified in the scanning exercise, with particular emphasis on what participants considered to be the two critical uncertainties: societal values and the nature of infectious diseases. The scenarios developed describe four distinctly different and plausible operating environments for AHEM in 2025. Based on the characteristics they displayed, the scenarios were called “Asleep at the Wheel,” “One World, One Health,” “Safe Food Inc.” and “In My Backyard.” Each scenario stimulates further thinking about the potential risks, threats, challenges and opportunities – and how the trends and drivers may have an impact on the AHEM system.

2. Fore-CAN Integrated Animal Health Risk Management Framework (Figure 4) comprises four health dimensions in the shared vision (animal health, public health, economic health and eco-system health); five risk management action areas (anticipate; prevent; prepare; respond; and recover and renew); and five key capability areas (Organization and Decision-making; Science and Technology; Expertise and Personnel; Policy, Law and Regulation; and Information and Data-sharing). These dimensions and areas will need to be developed to create a more integrated, agile and adaptive AHEM system that is complementary to the “One Health” concept.5

3. Fore-CAN Integrated Animal Health Emergency Management Roadmap (not shown) identifies key outcomes in the short, medium and long terms, as well as candidate initiatives that could be aligned for building the requirements of each capability area.

Figure 3. Plausible future scenarios for the future animal health in Canada in 2025

Figure 4. Fore-CAN. Integrated Animal Health Risk Management Framework (simplified)

5 One Health at a Glance www.oie.int/for-the-media/onehealth/
4. Fore-CAN Capability Assessment Tool provides a simple, systematic process to help diverse participants make an assessment of: i) the drivers and impacts of issues across the four health dimensions; ii) where the risk management system may be vulnerable, and where gaps may exist; and iii) why the system may be vulnerable as explained by strengths and weaknesses in key capability areas.

Using the tools in a stepwise fashion is helping diverse groups of participants from science, policy and other backgrounds understand, for example, the complex forces driving the emergence of an infectious disease such as avian influenza, and how the various dimensions of health could sustain direct or indirect consequences and to what degree. If system vulnerabilities and gaps are identified, strategies and activities across organizations can then be aligned to address them, thereby strengthening the risk management system and achieving desired outcomes.

The assessment tool can assist in planning research strategies and action plans by situating research within a broader system of capabilities that need to be developed to support outcomes. For example, other system-level capabilities such as policy development, regulations, education and training and information and communication activities may require investment in order to optimize the overall risk management system.

**Managing future animal challenges**

During Fore-CAN, partners and participants gained an understanding of the ability of foresight activities to build relationships and trust among diverse stakeholders, to help develop shared understanding of complex issues and different points of view, and to aid in illustrating connections among processes, functions and organizations within a multifaceted system. Insights were also gained about future threats and challenges to animal health and their interconnectedness, uncertainty and volatility. The importance of ongoing partnerships and the need for a holistic approach to animal health risk management were other learnings that arose from Fore-CAN.

The systematic and collaborative foresight activities of the Fore-CAN initiative harvested the wisdom and experience of participants from over 40 organizations. According to participants, the key achievements of the Fore-CAN initiative included:

1. **Recognized value of foresight**
   Foresight proved to be a powerful catalyst for awareness raising, change, action and innovation. Participants have an understanding of foresight methods and how they can be used to anticipate future requirements.

2. **An invigorated animal health community.**
   The community was integrated into the foresight process, learning new skills and building new relationships and partnerships. A network of stakeholders with a shared vision, commitment to collaboration and mutual trust has been developed.

3. **A system-level, capability-based framework, roadmap and assessment tool for animal health in 2025.**
   A shared vision has been established along with an integrated framework for action and tools to assist decision-makers in planning and investing in capabilities to achieve desired outcomes within the animal health system. Partner organizations in Canada have already applied the products of Fore-CAN to think critically and innovatively about animal disease surveillance, emerging zoonotic disease risk assessment, anticipation and intelligence activities, new skill sets to integrate activities across health dimensions, and the role of inter-disciplinary research teams to define problems and develop solutions. The insights and tools developed through Fore-CAN have the potential to be adapted and used by participants challenge with working together in any complex system in order to better assess and understand issues and thereby move toward achieving common outcomes.

**Citation:**

**Contact information:**
Author of the brief Shane Renwick (shane.renwick@inspection.gc.ca). The Brief series coordinator Robin Bourgeois (Robin.Bourgeois@fao.org).

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