NATIONAL FARMED ANIMAL HEALTH AND WELFARE COUNCIL

(ON BEHALF OF THE ANIMAL HEALTH CANADA WORKING GROUP)

Inventory Assessment and Gap Analysis of Canada's Prevention, Preparedness, Response, and Recovery from an Animal Health Event

Report for Animal Health Canada Working Group

February 13, 2020

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Executive Summary and Gaps at a Glance

The Animal Health Canada inventory assessment and gap analysis project of Canada's prevention, preparedness, response and recovery (PPR&R) for an animal health event took place between June and November 2019. The 6-month project consisted of background review, animal disease economic impact update, group consultations with key national groups, one-on-one consultations with key informants, liaising with other key initiatives and attendance at industry conferences. The consultation also included a bilingual gap analysis survey in October 2019 that received over 200 responses.

More specifically, the gap analysis consultation and inventory analysis has included the following activities:

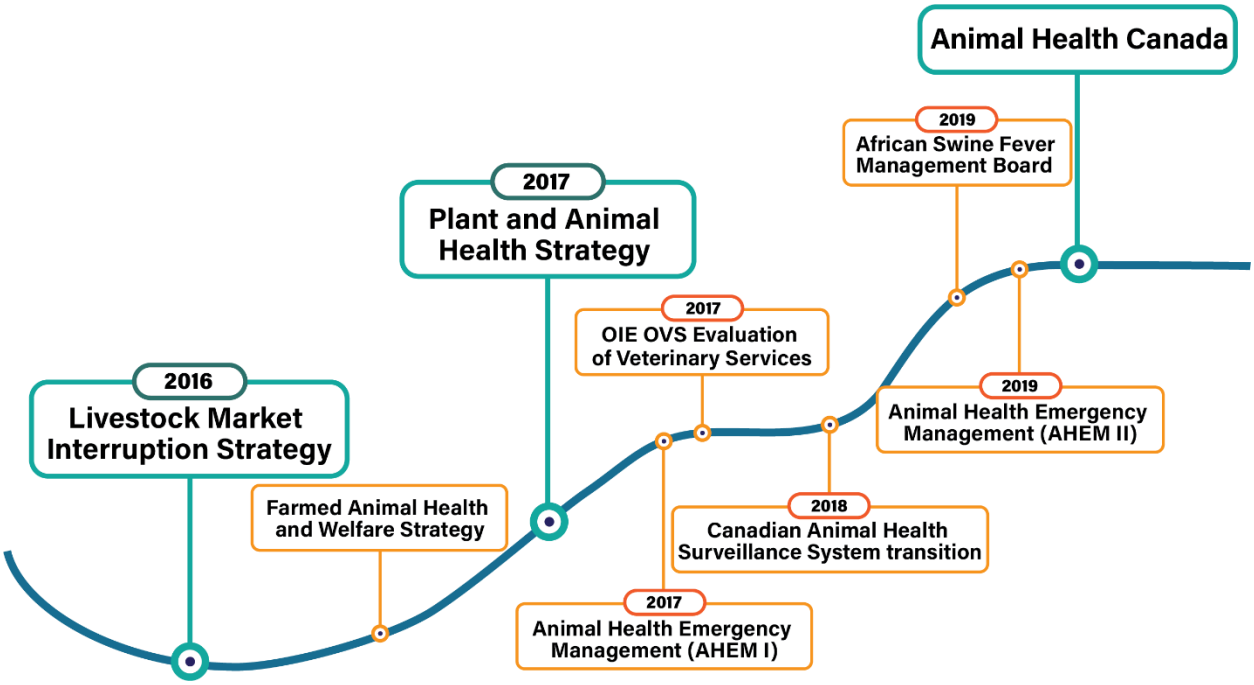
- A comprehensive review of background and previous reports related to PPR&R in Canada
- Gathering and analysis of animal disease economic impact studies
- Conducting group consultation calls with seven key national groups involving over 55 individuals:
    - National Farmed Animal Health and Welfare Council
    - Animal Health Canada Working Group
    - Council of Chief Veterinary Officers
    - Canadian Animal Health Surveillance System
    - National poultry sector organizations
    - Western Veterinary Diagnostic labs
    - Eastern Veterinary Diagnostic Labs
- Conducting one-on-one phone or in-person discussions with over 40 experts from across Canada ranging from key government personnel, commodity/producer organization representatives, veterinarians, researchers, academics, emergency management specialists, traceability administrators and processors.
- Liaising with teams from several other key initiatives or organizations such as:
    - Animal Health Emergency Management project team (AHEM II)
    - Le Centre de développement du porc du Québec (CDPQ)
    - Agriculture and Agri-Food Canada (AAFC)
    - Canadian Food Inspection Agency (CFIA)
- Attendance at the Pacific Northwest Economic Region conference (Saskatoon, SK) and Canadian Beef Industry Conference (Calgary, AB)
- Online survey of stakeholders available from October 6 to 23, 2019 which yielded:
    - English = 177 responses
    - French = 24 responses

The project also included several other aspects such as: developing a resource library of reports; calculating the existing financial investment in animal health programs and activities; and a review of existing risk management tools.

The gap analysis focussed on Canada's Prevention, Preparedness, Response, and Recovery systems for animal diseases. The consultation process revealed many strengths and success stories related to animal health emergency management in Canada such as development of the Livestock Market Interruption

Strategy (2016), the Plant and Animal Health Strategy for Canada in 2017 and the formation of the National Farmed Animal Health and Welfare Council (NFAHWC) in 2010. Building on these the Animal Health Emergency Project (AHEM) aligns with several national strategic initiatives, including the LMIS led by AAFC, and the Plant and Animal Health Strategy (PAHS) facilitated by CFIA. The AHEM projects have focussed on minimizing serious animal disease impact through enhanced industry awareness, capacity and confidence. In addition, the poultry and swine sectors have made significant progress on preparedness and emergency response capabilities. Recently, the formation of an African Swine Fever Management Board has been very successful in preparing for this disease.

Continual progress to advance animal health and welfare in Canada



The AHEM projects are focussed on minimizing serious animal disease impact through enhanced industry awareness, capacity and confidence. The project aligns with several national strategic initiatives, including the Livestock Market Interruption Strategy (LMIS) led by AAFC, and the Plant and Animal Health Strategy (PAHS) facilitated by CFIA.

However, when looking across Canada and at all livestock species, several gaps and structural inefficiencies do exist. The following is a summary of the main structural and organizational gaps revealed during the consultation.

Figure 1: Structural and Organizational Gaps at a Glance

Overall, the largest gap is the lack of a cohesive national approach that can provide stronger FPT government -- industry collaboration.
The current fragmented structure leads to inefficiencies, missed opportunities for synergies and slower decision making. The end result of the current structure is increased risk and overall cost for both government and industry.

Recommendations to improve organization and structural gaps:

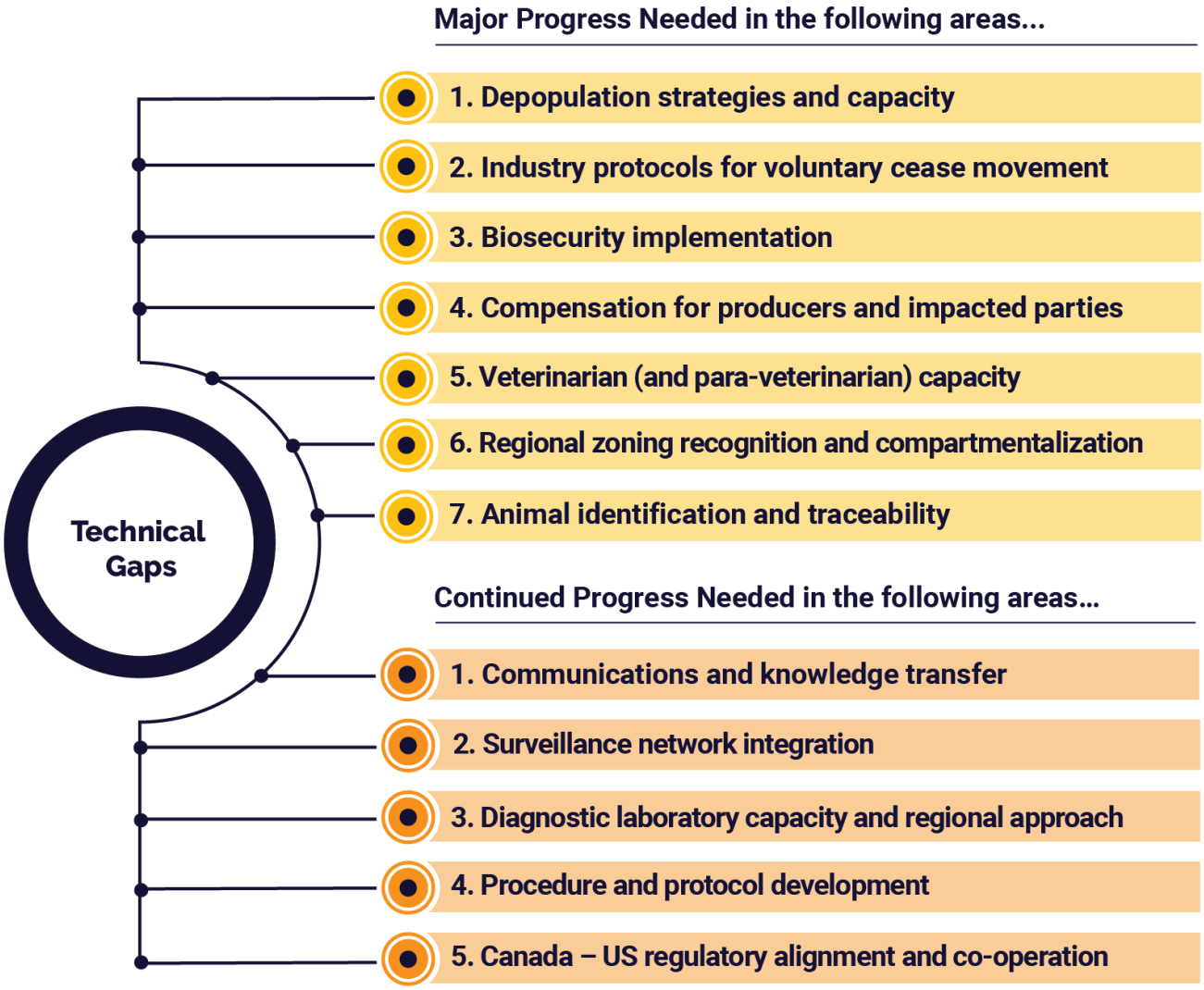
1. **Create a national umbrella organization:** We recommend that a central organization be the national umbrella organization for animal disease management and animal welfare.
2. **Reduce provincial differences:** There are major differences in legislation, preparedness activities and response capabilities amongst provinces and territories. In some cases, it may be more appropriate to manage some diseases or issues at the Federal level. At the Provincial level, the goal should be to achieve a high level of readiness with as much uniformity and harmonization as possible
3. **Focus on diseases that matter:** Use a risk-based approach to assess and then focus on the diseases of significance from economic, animal and human health perspectives, whether they are reportable or notifiable or endemic.
4. **Increase Disease Emergency Simulations:** Simulations of disease outbreak emergencies are key to ***making it real*** for everyone involved. Getting into the details of how a disease outbreak will be managed is needed so that there can be a clearer understanding around roles for responding to a FAD.
5. **Strengthen Communications and Education**: Communication across all stakeholder levels, but in particular at the producer and supply chain level, was indicated to be a major gap.

Communication needs to be recognized as a core priority that requires forethought, a strategic approach and adequate resources.

The consultation also revealed several technical gaps where major or continued progress is needed. These gap areas are ranked in order or priority based on feedback during the consultation, the survey results as well as our analysis of the situation. It is important to mention that while the gaps below have been ranked in order of importance, all areas are critical and interrelated, and each must be addressed.

Note: It is recognized that animal welfare implications of disease are significant and important. Animal welfare has been included in this report where relevant, but the topic of animal welfare as a whole is not included in the scope of this report.

Figure 2: Technical Gaps at a Glance



Recommendations to improve technical gaps:

The recently established African Swine Fever Executive Management Board has been viewed as a very positive move to prepare for that risk. We recommend that a task force with a similar level of authority be formed to assess and determine actions and next steps for each of these technical areas.

Additional details on what is in place, the gaps For Canada's prevention, preparedness, response, and recovery systems for animal diseases are included in full the report.

Participants in the AHC working group:
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Canadian Cattlemen's Association - David Moss
Canadian Meat Council - Kim O'Neil
Canadian Pork Council - John Ross
Canadian Sheep Federation - Corlena Patterson
National Sheep Network - Jennifer MacTavish
Dairy Farmers of Canada - Cheryl Schroeder
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Maple Leaf Foods - Rory McAlpine
Canadian Poultry Industry - Robin Horel
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Context for Animal Health Disease Management

The Canadian animal agriculture sector is diverse in size, value and end market. In 2018, the sector generated $24.7B in farm cash receipts. The red meat industry shipped products worth $21.1B, including 12M cattle and calves, 14M hogs, 825,400 sheep and lambs, 230,034 goats, 119,314 bison and 37,343 cervids.[1] The dairy industry ranks just behind red meats at $7.7B.[2] Meanwhile, the poultry and egg industry produced $4.6B worth of products, with 1.4B kg of meat production. In addition to farm cash receipts, the animal agriculture sector has a much bigger impact through farm inputs, further processing and exports. For example, red meat consumption supported 288,000 Canadian jobs and generated $15.3B of economic activity in 2016.[3]

By species, beef cattle have the largest number of farms across Canada, followed by horse, dairy, poultry and eggs, hogs, sheep and goats, and other animals (**Figure 1**: **Number of livestock farms in Canada, by province, by primary species**). In addition, a large number of farms raise a combination of these species.

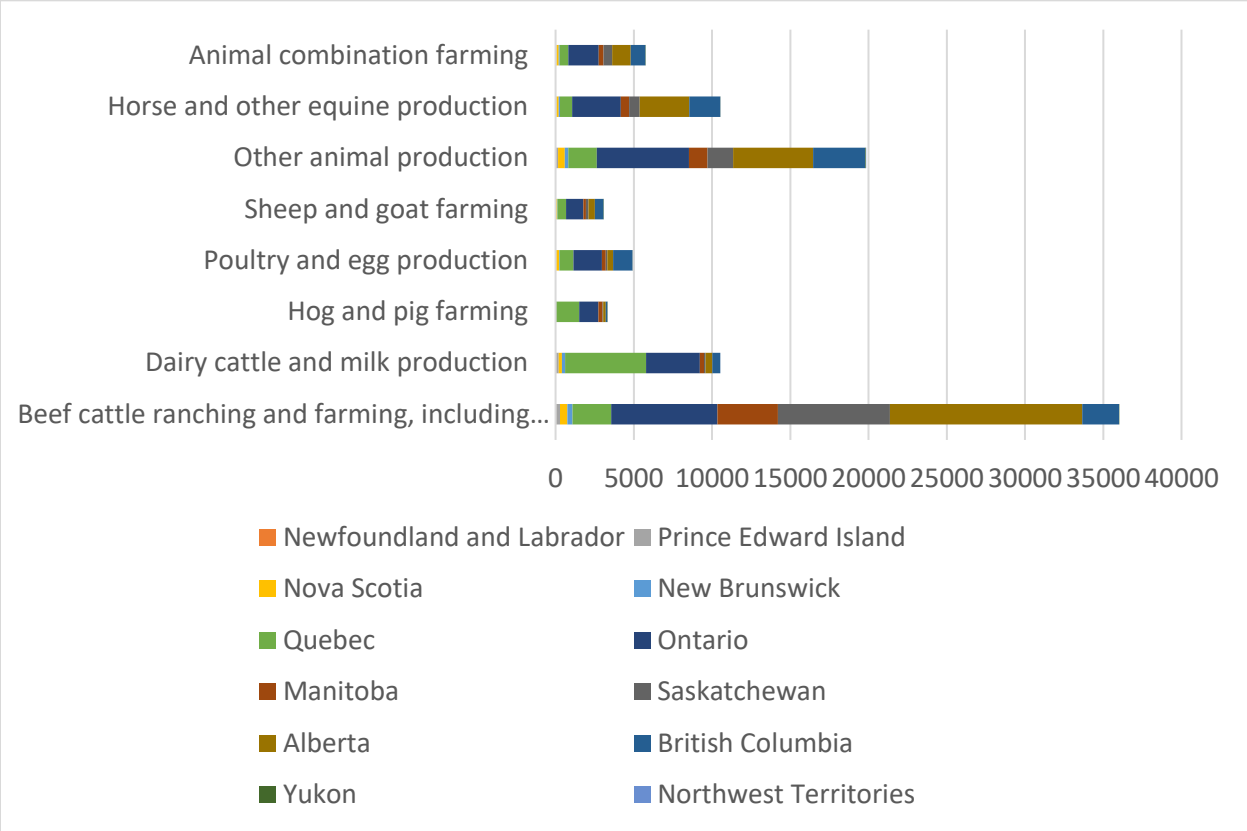


Figure 1: **Number of livestock farms in Canada, by province, by primary species**[4]
Source: Statistics Canada. Table 32-10-0403-01 Farms classified by farm type

[1] Agriculture and Agri-Food Canada Canada's red meat and livestock industry at a glance
[2] Agriculture and Agri-Food Canada Red meat and livestock farming revenues and expenses
[3] Canadian Meat Council
[4] Please see Appendix 1 for an explanation of the categories

Among the species, hogs and cattle are the most export-oriented, as export takes up 70% and 44% of total cash receipts respectively. Comparatively, dairy (5%), poultry and eggs (7%) rely less on export, due to the nature of supply management.[5] As a result, an animal disease outbreak in the export-oriented species will cause much greater economic impact in the form of lost sales due to trade bans. This partly explains why the negative economic impact of epidemic reportable diseases is particularly staggering.

Our updated economic impact measures show that a Foot-and-Mouth Disease (FMD) outbreak today would likely cost the industry $38 - $50 billion, an Avian Influenza (AI) outbreak in British Columbia (BC) could cost $609 million, and a Bovine Spongiform Encephalopathy (BSE) outbreak could cost $4-6 billion while a 4-month trade ban alone would cost $2.75 billion to the economy. However, whether reportable or not, all animal disease outbreaks will result in economic effects measured in hundreds of millions of dollars. For example, Porcine Reproductive Respiratory Syndrome (PRRS) - a production-limiting pig disease that is common in central and eastern Canada - is calculated to cost almost $200 million annually.

Protecting the health of farmed animals helps ensure Canadian domestic food supply and also drives economic growth. The Agri-Food Economic Strategy Table recommendations for increased exports includes the need to build "an agile regulatory system that supports innovation, provides certainty to industry, and protects health and safety".[6]

Livestock Market Interruption Strategy

In 2012, Federal, Provincial and Territorial (FPT) Assistant Deputy Ministers of Agriculture started the process of developing a Livestock Market Interruption Strategy (LMIS), with the goal of enhancing industry and government preparedness to deal with a market interruption from an animal disease event. Launched in April 2016, the LMIS is intended to be a national strategy supported by two policy objectives:

- Managing industry transition and ensuring a functioning domestic market, through measures including herd management, carcass disposal and transition assistance measures; and
- Facilitating the resumption of international trade and maintaining domestic consumption.

A key finding was the "importance of the network"

The work to develop the LMIS included seven pillars: emergency management governance, communications, industry transition, humane depopulation and carcass disposal, marketing options, domestic consumption and resumption of international trade. The results were a comprehensive, national strategy to address the market impacts of a large-scale market interruption in Canada, as well as many "lessons learned" that could be applied to future initiatives.
Having an effective forum to ensure collaboration between FPT governments and industry is needed when dealing with an animal health emergency. Part and parcel with this is recognizing that all parties (federal government, provincial governments, producer organizations, processors and other stakeholders) have roles and responsibilities during a disease event.

[5] Agriculture and Agri-Food Canada, Canadian International Merchandise Trade Database
[6] https://www.ic.gc.ca/eic/site/098.nsf/eng/00022.html

Farmed Animal Health and Welfare Strategy 2020

The National Farmed Animal Health and Welfare Council (NFAHWC) published a strategy in 2015 that was designed to provide direction to stakeholder work. It set three 5-year priorities for the sector: emergency management, social license and building leadership capacity.

Plant and Animal Health Strategy

Building on these successes, in 2017 the Canadian Food Inspection Agency (CFIA) championed the creation of The Plant and Animal Health Strategy for Canada, which charts a path for working better together to safeguard plant and animal health. The vision for the strategy is that "Canada's plant and animal resources are safeguarded, contributing to economic growth and the protection of human health and the environment." Achieving this vision is further complicated by increasing trade volumes, changing trade patterns, more integrated supply chains, changing climate and risks from new animal diseases. Effective prevention, preparedness, response and recovery systems to managed animal diseases is essential to success for Canada.

Guiding Principles

Plant and Animal Health Strategy

- Prevention-Focused
- Efficiency and Continuous Improvement
- Adaptive, Evidence- and Risk-Based Approach
- Shared Accountability
- Collaboration, Sharing, and Transparency

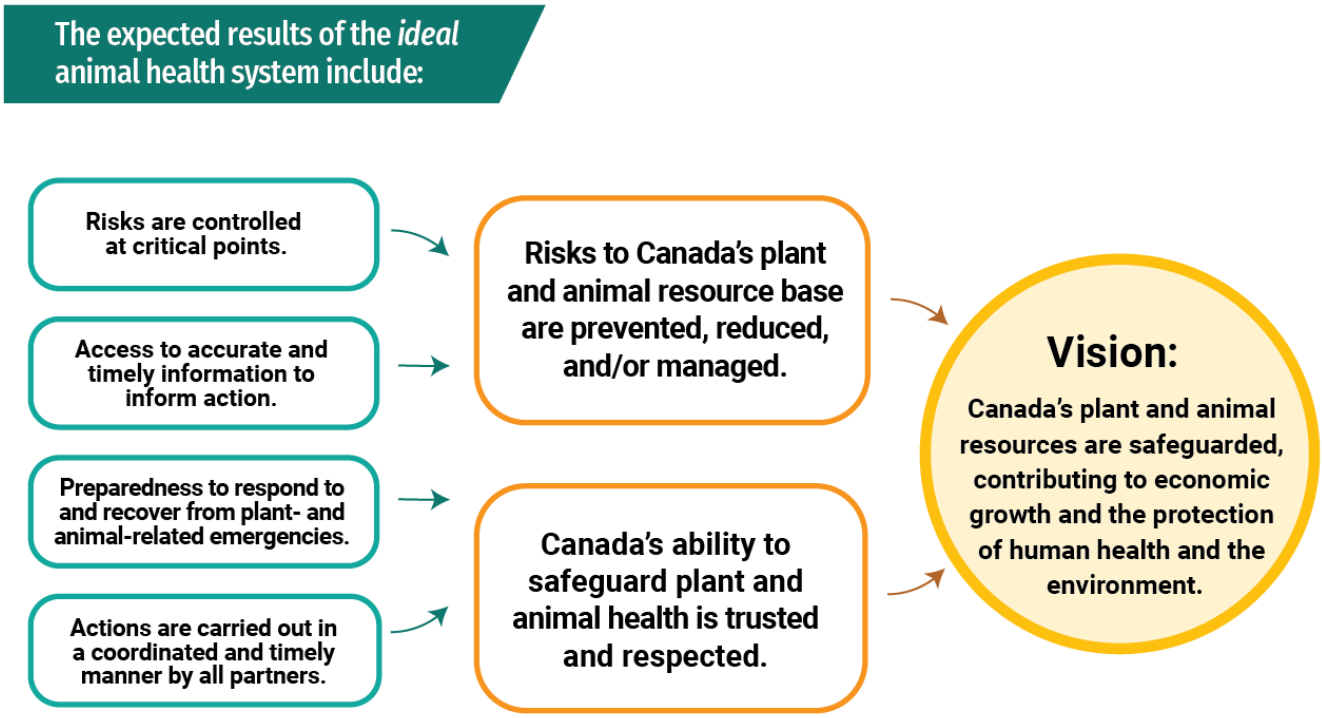
The process identified several overarching challenges, specifically:

- Greater focus is placed on response and recovery than on prevention and mitigation;
- Stakeholders sometimes collect and analyse information according to their own needs, but with limited data sharing;
- Necessary actions are not always taken by partners;
- Limited preparedness in some commodities; and
- Limited co-ordination across all stakeholders/partners affects the overall effectiveness of the system.

> *"Development of the Plant and Animal Health Strategy through the Council was gratifying to take part in."*

The resulting strategy created momentum for sector stakeholders and revealed, among other things, that **many activities in the current animal health system are not integrated and thus, the system is not optimized due to fragmentation and lack of effective partnering.** The expected results of the *ideal* animal health system work in concert and build toward the ultimate vision.

Plant and Animal Health Strategy – Expected Results



The National Farmed Animal Health and Welfare Council (NFAHWC) was assigned to coordinate the implementation of the animal aspect of the Plant and Animal Health Strategy for Canada.

African Swine Fever Executive Management Board

African swine fever (ASF) is a highly contagious viral disease of pigs that spreads rapidly through swine populations by infected pigs or pig products. The virus has spread over a large part of China since the first confirmed outbreak in August of 2018, which has resulted in massive reduction in that country's pig production. The imminent risk of ASF has prompted animal health stakeholders in Canada to form an Executive Management Board of senior leaders from both government and industry to champion prevention and preparedness efforts to combat the disease. Focus areas of this work include the following pillars:

- Prevention and Enhanced Biosecurity
- Preparedness Planning
- Ensuring Business Continuity
- Coordinated Risk Communication
- Research

This effort can be viewed as a **"living lab"** example of how government and industry can move beyond the traditional stakeholder-government relationship to a more collaborative approach to prepare for a disease outbreak risk.

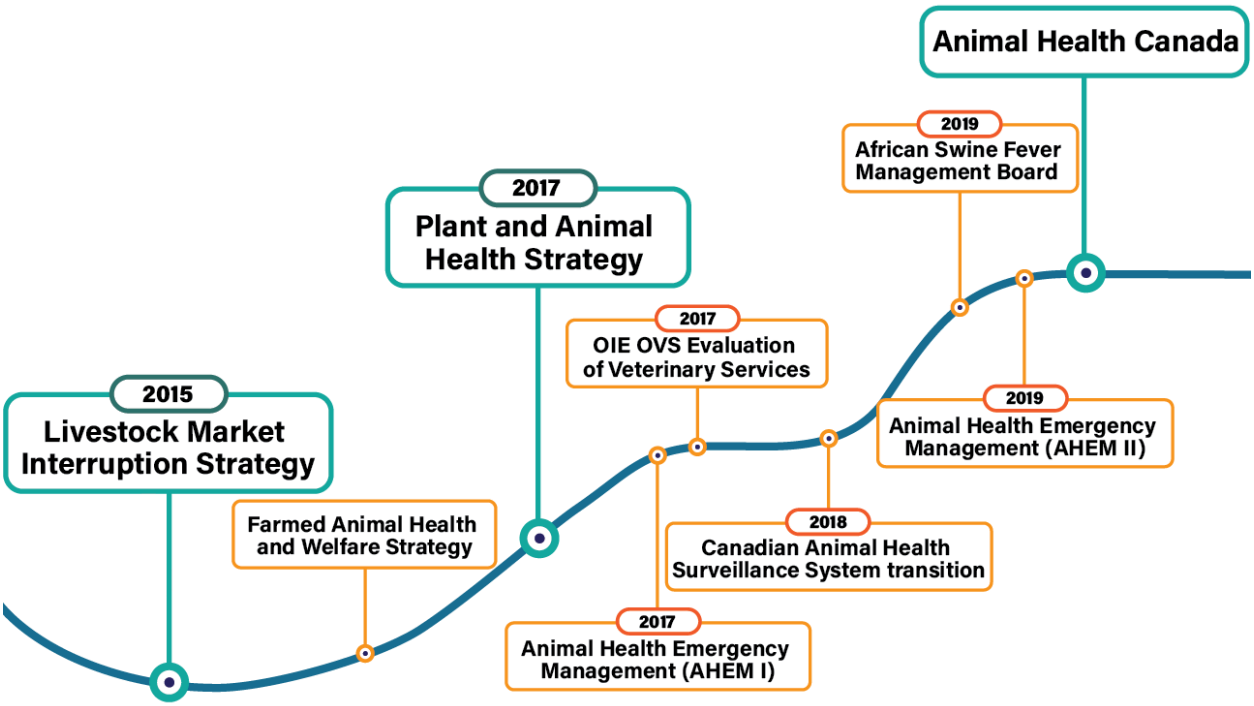
Animal Health Canada

These activities, among others, have culminated in discussions suggesting the formation of Animal Health Canada as a new collaborative approach that can bring government and industry collaboration on animal health disease issues to the next level. The AHC working group envisions a broad, Canada-wide scope across all farmed animal species to ensure the health and wellbeing of Canada's farmed animals. The vision and mission are as follows:

- VISION: A sustainable agriculture and agri-food sector strengthened by an inclusive industry-governments partnership protecting the health and wellbeing of farmed animals.

- MISSION: Animal Health Canada provides leadership in building a collaborative, multi-partner model that clarifies the respective roles, responsibilities and accountabilities of each partner implementing an animal health strategy for Canada, beginning with emergency management.

Continual progress to advance animal health and welfare in Canada



Economic Impact of Livestock Disease Outbreaks

A number of studies have been conducted on economic losses associated with livestock diseases in Canada and elsewhere. The empirical measures of loss associated with disease help to put disease significance in context, put measures around the harm experienced by affected producers and supply chain members, and inform rational trade-offs between disease control/mitigation costs and benefits.

This section discusses the background behind estimates of economic costs of livestock diseases. It provides updated calculations with the most recent data (2018) to adjust for changes in livestock populations and prices.

Economic Elements of Livestock Disease Outbreaks

The many economic aspects of animal disease events underlie any estimate of economic costs. Based on the literature, some of these considerations are summarized in Table 1[7] below.

Table 1. Aspects of the economic costs of livestock disease outbreaks.

Disease Effects	Zoonotic vs. non-zoonotic
	Reportable vs. strictly production-limiting
	Mortality vs. morbidity proportion
	Broader supply chain effects (direct and indirect)
	End-consumer demand effects
Disease Scope and Spread	Endemic vs. Epidemic vs. Pandemic
	Mode of spread
	Range of species impacted
	Age distribution of animals impacted
Incentives Treatment and Efficacy	Approach: control vs. eradication
	Efficacy of control measures
	Cost of treatment/destruction vs. lost income
	Incentives for participation in controls
	Timing of initial outbreak vs. response

These considerations provide important context in interpreting the economic impacts of livestock diseases. There are a range of possible effects to measure, including:

- Lost sales – due to mortalities and/or morbidity/reduced animal performance
- Lost profits – due to increases in production costs and/or reduced animal performance
- Additional and extraordinary costs related to control – out of pocket costs from stamp-out/destruction or acute treatments
- Costs transmitted along the supply chain (direct and indirect)
- Lost markets or consumer demand, which may not recover for some time
- Mental health impacts of non-zoonotic diseases on producers and service providers, including veterinarians, involved in disease response.

[7] Please see Appendix 2: Economic Impact Analysis - Backgroundfor an in-depth discussion on the economic elements of livestock disease outbreaks

Typically, economic studies only have the scope to pick up a subset of these effects, and different studies will choose to focus on specific effects. This generates something of an eclectic mix in surveying and comparing study results.

Updated Economic Impact

To put these past studies in perspective, the historical measures were updated with the most recent data (2018) to adjust for changes in livestock population and prices. There are two main factors to consider when updating this data:

- First, relative to the period in which most of the studies above were completed, the population of beef and dairy cattle has broadly decreased, while hogs and chicken (broilers and layers) have increased. This is captured using a population scale factor, which compares the historical and current population of the animal species at risk. By adjusting to the current population size, loss of sales, profits and out-of-pocket costs are put into the current scale of the industry.
- Secondly, broadly speaking, livestock prices have increased relative to the period in which the studies were conducted. This is summarized using the Farm Products Price Index (FPPI) for Total Livestock and Animal Products, which reflects the value of livestock in 2018 Canadian dollars relative to past time periods. The trends in the index are illustrated in Appendix 2: Economic Impact Analysis - Background, with comparisons to the FPPI for Cattle, Hogs, and Poultry. The figure shows that the Total Livestock Price Index broadly summarizes trends, and averages out the volatility among cattle, hogs, and poultry. For the purposes of adjusting past data to a 2018 basis, the monthly index was averaged to an annual value.

Table 2 presents an update of the results of these studies, essentially restating each study's results had the study been undertaken today. What is initially striking about the updated results is that a range of aspects, costs and effects are captured in these studies. In some, with the benefit of hindsight, the assumptions and scope were quite limiting. This is especially evident in the studies relating to BSE, in which it was assumed that export restrictions could be in place for up to four months.

The estimated negative economic effects of animal disease outbreaks, especially epidemic reportable diseases, is staggering.

However, even with the range of approaches and limitations, the estimated economic effects of animal disease outbreaks, especially epidemic reportable diseases, is staggering. The key case in point is FMD. Economic studies done more than 15 years ago suggested economic effects ranging in a wide band around $30 billion; even with a significant drop in the beef cow herd, the estimated impact of an FMD outbreak today exists in a range around $38 billion, and could top $50 billion. To put it into context, the GDP of Nova Scotia in 2018 was approximately $36.5 billion[8]. There are no examples in which a significant livestock disease, whether reportable or strictly production limiting, does not result in economic effects measured in hundreds of millions of dollars. For example, PRRS – a production-limiting pig disease that is common and even prevalent in eastern Canada – may be costing almost $200 million.

[8] Expressed in chained 2012 dollars. Statistics Canada. Table 36-10-0402-01 Gross domestic product (GDP) at basic prices, by industry, provinces and territories (x 1,000,000)

Finally, the economic impacts estimated in studies, varying in scope and methods/approach, could broadly be viewed as conservative. The rationale for this is that it is difficult to capture the full range of effects, especially when the disease peril has not yet manifested, and the full set of considerations in control and remediation are unknown. For example, the Canadian swine segment is planning both biosecurity for prevention and remediation in the event of infection with African Swine Fever (ASF). A potential aspect of remediation is a need to euthanize and dispose of large numbers of pigs on-site. The protocols for doing so appear to still be in development, and even if they were available, an estimate of cost would be at best speculative as we have no experience implementing them in Canadian conditions.

Table 2. Updated Studies of Lost Sales/Profits/Market Access Due to Livestock Diseases[9]

Year of Study	Organization/ Author	Estimated Negative Economic Impact in Original Study	Negative Economic Impact Updated to 2018
Foot and Mouth Disease (FMD)			
2003	CFIA	$30 B	$37.7 B
2002	CAHC[10] (Serecon)	$13.7-45.9 B	$16.3-54.7 B
Bovine Spongiform Encephalopathy (BSE)			
2003	CAHC (Serecon)	$2.55 B (4-month trade ban)	$2.75 B
2006	Samarajeewa et al.	Alberta, Ontario, Quebec and Sask.: reduction of value of exports by $10 million would reduce average GDP and labor income in above provinces by $8.7 and $3.7 millions. Approximately 145 jobs per province would be lost and industrial production would be reduced by $19.7million	Reduction of value of exports by $10 million would reduce national GDP and labor income by $9.6 and $4.6 millions. Approximately 117 jobs would be lost nationally and economic output would be reduced by $26.4 million
2005	Carlberg and Brewin	$5.5 B	$5.96 B
2006	Le Roy et al.	$4.1 B	$4.38 B
Avian Influenza (AI)			
2004	Serecon	$391.2 M	$609 M
Porcine Circovirus Associated Disease (PCVAD)			
2010	Canadian Swine Health Board (eBiz)	$1.4 B	$1.67 B
Porcine Reproductive Respiratory Syndrome (PRRS)			
2011	George Morris Centre, CDPQ, Prairie Swine Centre, OVC	$130 M/year	$184 M/year

[9] Studies are updated based on current livestock population and prices
[10] CAHC = Canadian Animal Health Coalition

Consultation and Survey Feedback - What's in Place and Where Gaps Exist

We conducted both group and one-on-one consultations with stakeholders. We asked stakeholders to articulate, from the perspectives of their organizations, what's working well, what could be improved and where gaps exist in the categories of preparedness, prevention, response, recovery, legislation and coordination/collaboration. To help generate the thought process, in consultation with the AHC Working Group, we developed a comprehensive list of activities and sub-components within the overarching categories of PPR&R.

The Animal Health Canada Gap Analysis Survey was designed based on recommendations from the initial consultations and the resulting list of gaps identified by stakeholders. This survey was distributed Canada-wide to elicit the opinions of a much broader stakeholder circle representing government, producers, veterinary services, universities, processors and lab services. The total number of English and French survey respondents was 201. A detailed analysis of all survey questions can be found in Appendix 4: Survey Results.

The following is a summary of the feedback gathered from stakeholders during the initial phase of the consultation process, supported by the relevant survey results. All figures in this section are generated from survey results. We would also like to acknowledge and thank the AHEM team for providing us with their list of gaps, of which we have incorporated many.

Coordination and Collaboration

The NFAHW Council is helping to break down silos

What's in place

- Formation of the National Farmed Animal Health and Welfare Council (NFAHWC) is encouraging more industry/government collaboration as well as more cross-species interaction and sharing.
- Development of the Plant and Animal Health Strategy (2017) is viewed as a major success and building block for the sector.
- Canadian Council of Veterinary Officers (CCVO) are well-organized and are collaborating well. The CFIA-CVO relationships need to continue to build on the success to date.
    - The OIE PVS assessment concluded that the co-ordination and management of veterinary services is generally strong with excellent internal coordination between CFIA and the provincial/territorial ministries at the CVO level.
- The Canadian Veterinary Medical Association (CVMA) is facilitating increased discussion and communication between existing species veterinary groups.
- Canadian Council of Veterinary Registrars (CCVR) has been a good forum to discuss issues and encourage collaboration among federal departments and agencies.
- The Foreign Animal Disease Emergency Response (FADER) agreement between and OMAFRA and CFIA is a good example of successful coordination and collaboration in this area a coordinated multi-agency and multi-disciplinary response mechanism designed specifically to

address the threat of a FAD. The Plan requires input from the Ministry of Environment and Climate Change on the disposal of animal carcasses and related contaminated or suspect materials.

- The animal health surveillance system is currently managed through a series of networks, such as the Canadian Animal Health Surveillance System and the network of producer's groups for each species.
- The OIE PVS Evaluation report (2017) rated all aspects of "interaction with interested parties" as a level 5, meaning that Canada has high capacity and is fully compliant with international standards.

> *"ASF preparedness is a great model for the overall concept of collaborating on prevention."*

> *"The Tuberculosis incidents in Western Canada showed a lot of collaboration between industry and the provinces. This has enabled Canada to stay on the 'sunny side' of TB."*

Where are the gaps?

- Governance and responsibilities for all of the different interests is an overarching issue and a gap. There are many activities and initiatives where mandates and roles may overlap but we lack a coordinated system to manage these situations. Consolidating similar organizations to avoid duplicate efforts was the most-cited opportunity to streamline the animal health system from survey respondents (Figure 2, survey question #9).
    - Stakeholders report that more collaboration is needed between federal agencies and the provinces.
    - Refinement is needed to define provincial and national roles/responsibilities of industry commodity associations.
    - There is a narrow definition/scope of Federal areas of responsibilities which means that Provinces or industry have to step into these areas (such as managing the non-reportable diseases), but with different means and regulations in each Province, this leads to inconsistency.
    - Mandates, legislation and regulations vary from province leading to confusion and in some cases, higher risk especially on diseases that are not reportable to CFIA.
    - The mandate of CVOs varies slightly across provinces and harmonization should be the goal where it may be helpful and not in conflict with provincial needs.
    - Reportable disease lists are different from province to province. In some cases, these differences are because certain diseases that are not on the federal reportable list must be handled by provinces and territories. The differences lead to confusion over roles and responsibilities.
    - An industry/government secretariat is needed for beef and other sectors to provide a coordinated response for planning, preparation and engagement of stakeholders during an emergency situation.
    - Federal-Provincial agreements for emergency response (FADER) may need to be refreshed for some provinces; would be beneficial to include industry perspective as part of the update.

> *"These strings must come together into a cohesive and agreed-upon approach that closes current gaps and provides coherent governance and clarity on roles, responsibilities and communications."*

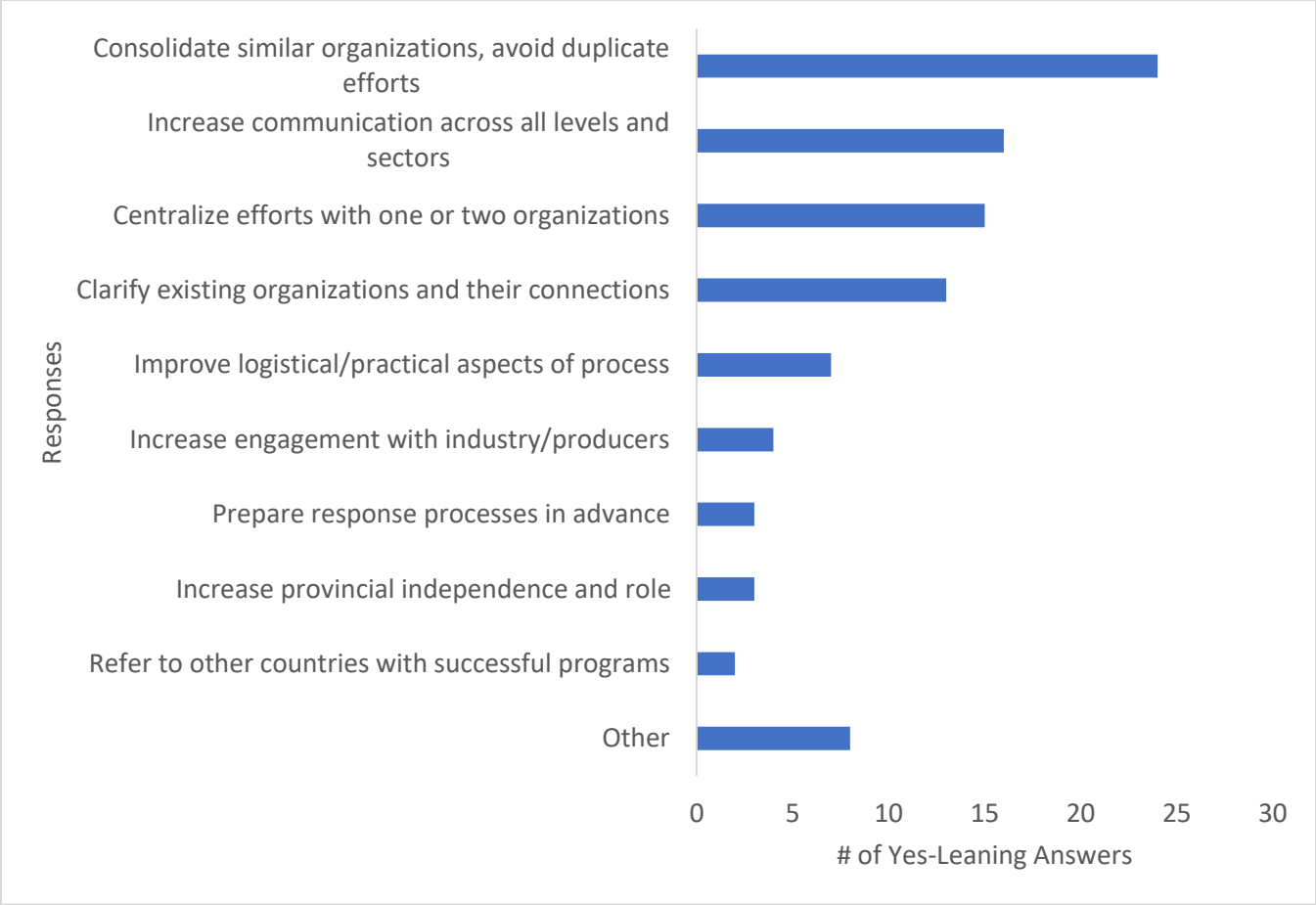


Figure 2. From survey question #9. Survey suggestions for streamlining animal health stakeholders, organizations, and networks. This figure was generated from 109 replies from 102 respondents.

- The CFIA-CVO relationships need to continue to build on the success to date to continually improve communication and response time.
- Roles and responsibilities need to be clarified in gray areas such as carcass disposal – e.g. separating disposal of diseased animals versus carcass disposal of healthy animals. Confusion over roles and responsibilities was an overarching theme in the survey responses.
- Fragmentation of authority creates provincial differences and some confusion or ambiguity. Many survey respondents expressed the desire for clarification around existing organizations and efforts, and how they are interrelated (Figure 2, survey question #9). There was also a clear difference in survey respondent understanding of roles and responsibilities when considering reportable, emerging, and endemic diseases (Figure 3, survey questions #10, 11, 12).
    - For example, CFIA has the regulatory authority for Federally inspected processing plants including animal welfare during transportation, however the Provinces/Territories have regulatory authority for on-farm animal welfare, on-farm food safety, auction markets, assembly yards as well as provincially inspected processing plants

Survey respondents recommended consolidating similar organizations to avoid duplicate efforts

- Provincially licensed plants face even more complexity because CFIA manages the on-farm aspect in a disease outbreak situation, but the plant's communication link is the Provincial meat hygiene officer and vet inspector; there have been situations where the CFIA zones are not always clearly communicated in a timely manner to the Provincial government and/or Provincial plan, similarly, the impact on other abattoirs within that zone are sometimes unclear, etc.

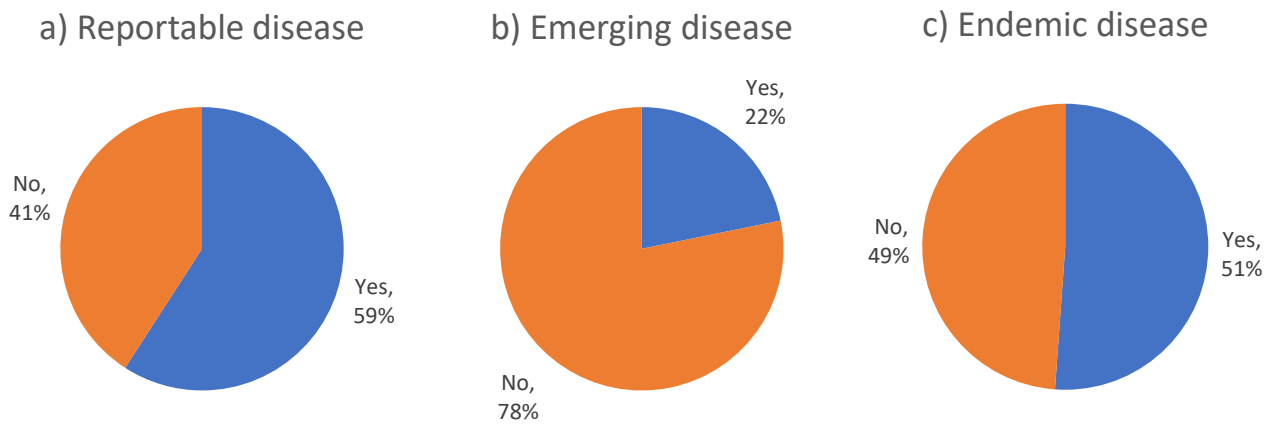


Figure 3. From survey questions #10-12. The percentage of respondents answering yes/no to whether or not roles and responsibilities are clear when considering a) a reportable animal disease; b) an emerging disease; and c) an endemic disease. Charts a, b, and c were generated from 137, 133, and 131 responses, respectively.

- Lack of one agency that represents wildlife interests and issues.
- Many industry organizations are engaged, but producers at ground zero often do not have the information and understanding on this topic (and thus are not well prepared to prevent disease and prepare for dealing with these situations). Even among reportable diseases (as opposed to endemic or emerging diseases), lack of industry/producer understanding and engagement, and the lack of clarity around reporting, were the most commonly listed barriers to understanding general roles and responsibilities (Figure 4, survey question #10).
- Levels of preparedness vary from province to province.
- Paper-based systems are still in use for some functions, such as some inspection procedures and diagnostic laboratories in certain provinces. These paper-based systems create inefficiencies and hamper data sharing compared with digital field and shared databases.
- There are CVMA-led national veterinary organizations for most major livestock species, but a small ruminant veterinary organization or committee is not in place. Having such a committee would improve information sharing about small ruminant issues.
- Caution from the poultry sector that development of Animal Health Canada doesn't come with unintended consequences or costs for the poultry sector which feels they have a good system in place.

Figure 4. From survey question #10. Reasons for why roles and responsibilities are unclear when considering a reportable disease. This figure was generated with 96 responses from 137 respondents.

- Mechanisms are needed to allow for effective data sharing across activities and between stakeholder groups. The current systems are fragmented and utilize multiple databases, making data sharing problematic.
    - CAHSS/CAHLN – linking inputs from labs – data is automatically collected into CNPHI network, but analysis, automated report creation and reporting out is not happening or is happening in limited ways (e.g. BSE samples).
    - Individual sectors struggle with integrating data from on-farm food safety programs, traceability, etc.
    - Data flow gap in ability to collate, synthesize, analyze and report out of laboratory data.
    - Need to have legal authorities share relevant information to protect human and animal health while still protecting personal privacy.
    - Surveillance systems are likely the most practical place to start integrating data

Prevention

What's in place?

- Commodity-specific National Farm Level Biosecurity Standards have been developed by CFIA and stakeholders.

> *"Producer organizations have stepped up to the plate on extension services."*

- Nearly every national commodity group has developed voluntary on-farm food safety and assurance programs that include traceability and biosecurity components.
- Generally speaking, biosecurity is relatively well-implemented in the poultry and swine sectors.
- Vaccine and Infectious Disease Organization (VIDO) in SK – vaccine and technology development for animal and human health.
- Increased government industry collaboration and investment into preventing entry of African Swine Fever. For example, $31 million was invested by the Canada Border Services Agency to increase the number of detector dogs.
- Canadian Animal Health Surveillance System (CAHSS) brings together stakeholders from all sectors, in animal and public health, to share information and address gaps associated with the multiple surveillance activities currently planned or underway.
- Canadian Animal Health Surveillance Network (CAHSN) collects animal diagnostic test results nationally, assimilates and reports the information to enable early warning capabilities.
- Canadian Animal Health Laboratorians Network (CAHLN) promotes information exchange on trends, techniques, and research in animal health diagnostics.
- Community for Emerging and Zoonotic Disease (CEZD) collects, filters, analyzes and disseminates disease intelligence information.
- Some regional surveillance networks in place (e.g. Ontario Animal Health Network, Réseau d'alerte et d'information zoosanitaire (RAIZO), Alberta Veterinary Surveillance Network).
- Some species-specific surveillance systems in place (e.g. Canada West Swine Health Intelligence Network).
- Within each species, there are established communications between national and provincial commodity groups and producers. Communication is particularly strong for supply-managed commodities.
- Science clusters identify priorities for research in managing animal health risks at the sector level.
- Investment of nearly $ 57 million by Canada's International Development Research Center (IDRC) for development, production and sustainable delivery of new vaccines affecting smallholder farmers in Africa and Asia. Diseases that are controlled in developing countries are less likely to be brought into Canada on goods or people.

> *"CEZD is a success story for grassroots information collection, analysis and interpretation."*

> *"The telephone is the most important surveillance tool out there."*

Where are the gaps?

- Biosecurity Implementation. 14% of survey respondents said that biosecurity was the most critical area to address to better manage animal health risks (Figure 5, survey question #5).
    - Implementation of biosecurity in the cattle, small ruminant, bison and cervid sectors is lacking.
    - Biosecurity implementation during transportation, and by community livestock sales barns and other high traffic areas is lacking, as is often the capacity to implement biosecurity.

> *"The whole marketing system for beef cows [livestock auctions] couldn't have a better disease dispersal system if you planned it."*

- National High-risk biosecurity protocols for use during outbreak have not been developed for most sectors. It is easier to enhance biosecurity measures in crisis situations if good routine biosecurity and the mindset are in place already.
- Consider cross-compliance of industry quality assurance programs and/or BRM programs with biosecurity at the farm level as a way to increase implementation for certain diseases or risks.

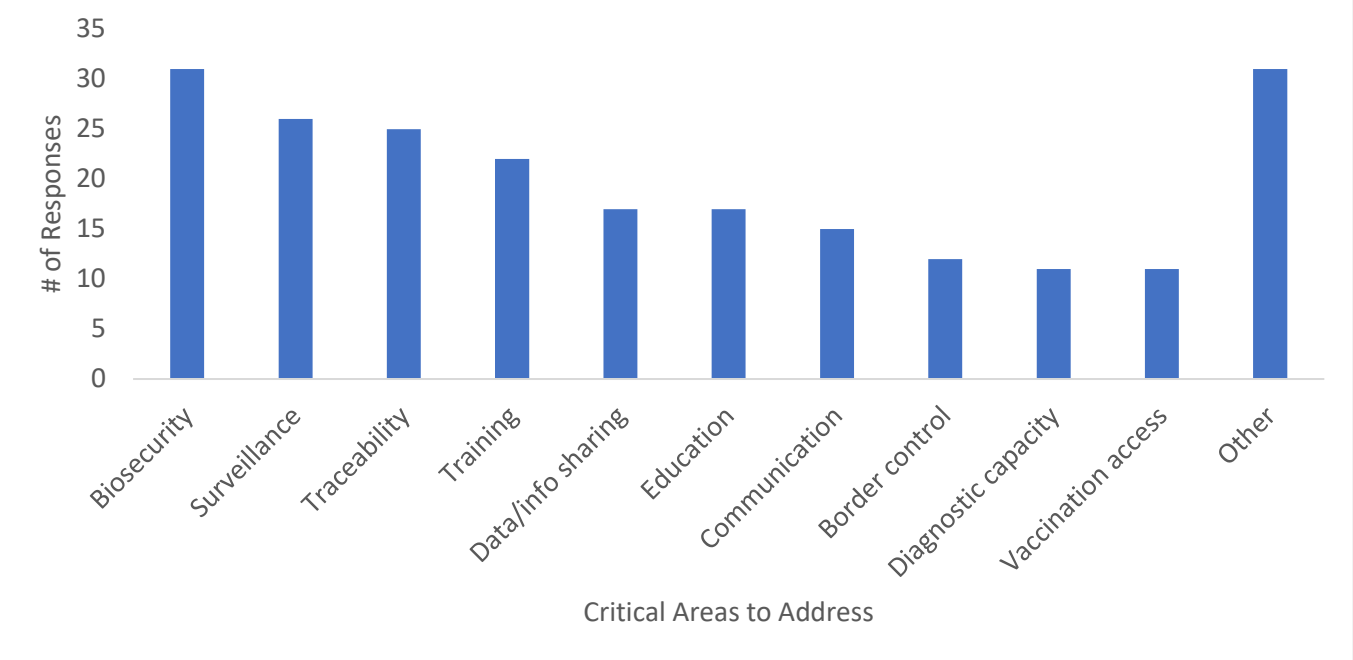


Figure 5. From survey question #5. The most critical areas within Canada's health system that needing addressing to better manage animal health risks. This chart was generated using 218 responses from 148 respondents.

- Communication to producers. 45% of survey responses listed communication, engagement, or training/producer education as an opportunity for improved industry/government partnerships (Figure 6, survey question #8).
  - There is often a lack of interest and uptake of information at the producer/rancher level. As business owners, producers are managing many aspects of their operation on a daily basis and may not be receptive to information unless it is urgent (but then it might be too late).
  - Biosecurity is often viewed by primary producers as a cost without benefit unless there is a direct and significant on-going threat.

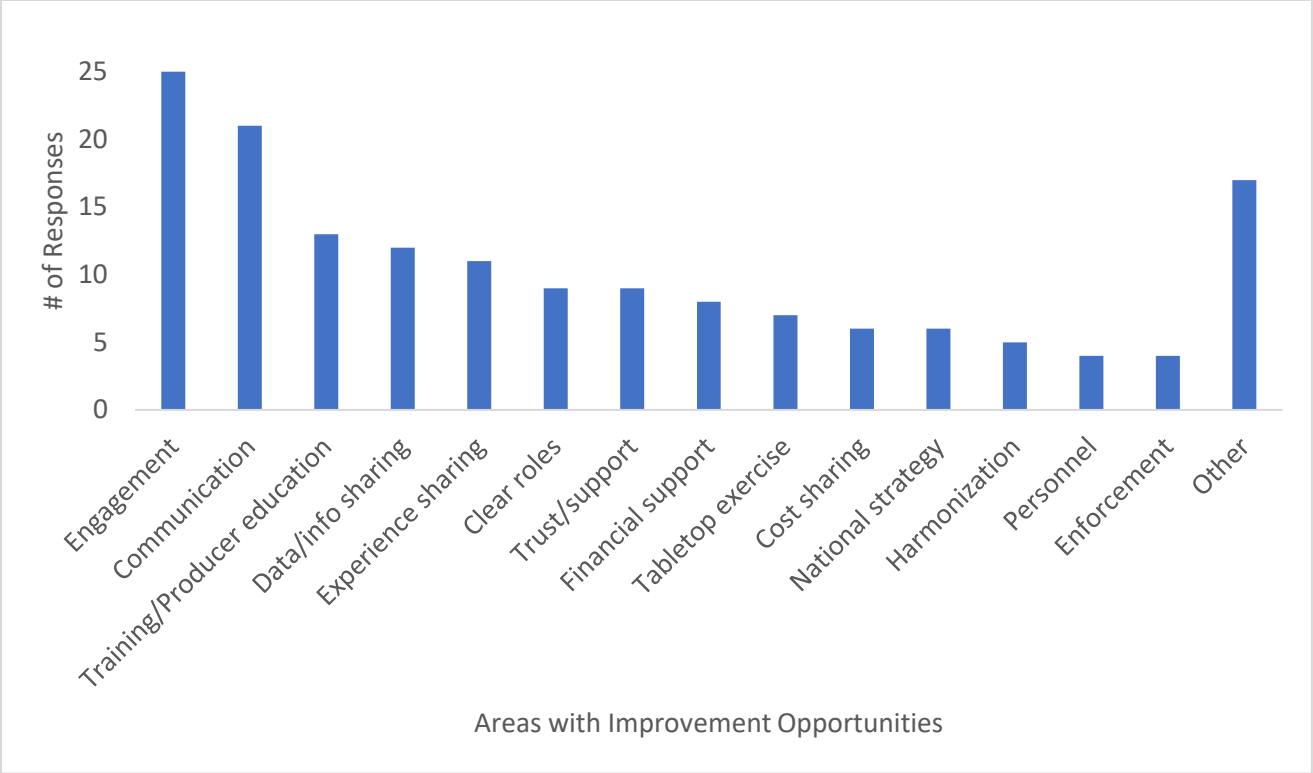


Figure 6. From survey question #8. Areas with opportunities to improve industry-government partnerships in animal health risk management, emergency response, and recovery. This figure was generated from 157 responses by 115 individuals.

__45%__ of survey responses listed communication, engagement, or training/producer education as an opportunity for improved industry/government partnerships.

- Engagement with others in the supply chain, such as auction markets, transporters, and feed suppliers, are also a challenge especially for the beef, dairy and small ruminant sectors. Poultry and swine appear to have more engagement with and communication to businesses along the supply chain.
- Vaccines can be used to effectively limit outbreaks of reportable diseases. However, developing vaccines to commercial use or licensing suitable vaccines registered in other countries continues to have regulatory and financial barriers that limit or prevent access. For "minor" species such as sheep and goats, access to approved drugs is limited.
    - The existing process to access vaccines for emergency use (e.g. veterinary biological import permit) is viewed as inadequate.
    - Adoption of shared agreements is needed to access international antigen banks for the livestock sector to access large doses of antigen (in case of outbreak). Currently the FMD antigen banks are shared with USA and Mexico, this but may not be enough given the millions of doses that could be needed.
    - CFIA oversight and audit control is needed for vaccination strategies to be accepted internationally.

- National leadership needed to coordinate regional surveillance systems/networks.
    - Variable capacity for animal health laboratory-based surveillance across the country (lack of surge capacity in Atlantic Canada, etc.).
    - Sector gaps in surveillance, for example beef, small ruminants, wildlife.
    - Passive surveillance of fallen livestock is a real gap in our system currently.
- Detailed messaging and communications protocols need to be developed for emergency situations from the federal to provincial level.
- Inconsistencies among Canadian Border Services Agency (CBSA) staff at different points of entry into Canada.
- There are inadequate resources to inspect incoming people and parcels to the extent needed, including those entering Canada by mail.

> *"CAHSS is the result of shared governance and collaboration. It aligns well with concept of Animal Health Canada.*
>
> *Collaborative governance requires sustainable funding to make it work."*

Preparedness

What's in place?

- ASF Executive Management Board and related committees is a new model for government and industry collaboration on monitoring, risk assessment and prevention.
- Full movement reporting in place for the swine sector, with PigTrace as the national administrator.
- Canadian Cattle Identification Agency (CCIA) is the recognized administrator and tag distributor for cattle, small ruminants and bison, although full traceability reporting is not in place nationally.

> *"Our CCIA identification system leads the world, but movement reporting needs to happen."*

- Zoning agreements for ASF are in place with the US and Europe. Discussions on zoning agreements are well underway with Japan.
- National on-farm assurance programs have training available to producers in most sectors (programs generally include animal welfare, traceability, biosecurity and food safety components). There is variation among sectors in participation in these programs, as well as variation in mandatory versus voluntary components.
- National Centre for Foreign Animal Disease offers training for veterinarians in FAD and emerging diseases.
- USDA-APHIS made their online FAD recognition courses available to Canadian veterinarians.
- Surge capacity (equipment and personnel capacity) for disease emergency situations exists in some areas.

> *Among survey respondents, traceability initiatives were the most-commonly cited type of failed animal health initiative.*

Where are the gaps?

- While animal identification is a national requirement for most livestock species, full traceability (i.e. movement reporting) is not yet in place nationally under the *Health of Animals Regulations* (exceptions are commercial swine and poultry). Among survey respondents, traceability initiatives were one of the most-commonly cited type of failed animal health initiative (Figure 7, survey question #4).
    - Having three CFIA recognized traceability administrators (Canadian Cattle Identification Agency, Pig Trace, and Agri-Traçabilité Québec) with DairyTrace in the works as a fourth, could or delay response times or cause inefficiencies when tracing of animal movements is required.
    - Movement reporting is not in real-time, which could impair rapid tracing and response during a disease outbreak.
    - Small-holder operations are not required to comply with traceability requirements.
    - Cost was identified as a key barrier to implementing traceability and movement tracking (both at farm level and processor level). A suggestion was made to focus first with groups interested in delivering traceability to prove authenticity of a product claim.
    - Increases in record keeping requirements will be a real challenge for Provincially inspected plants because many are multi- species operations and operate at a different (smaller) scale so automation is too costly.

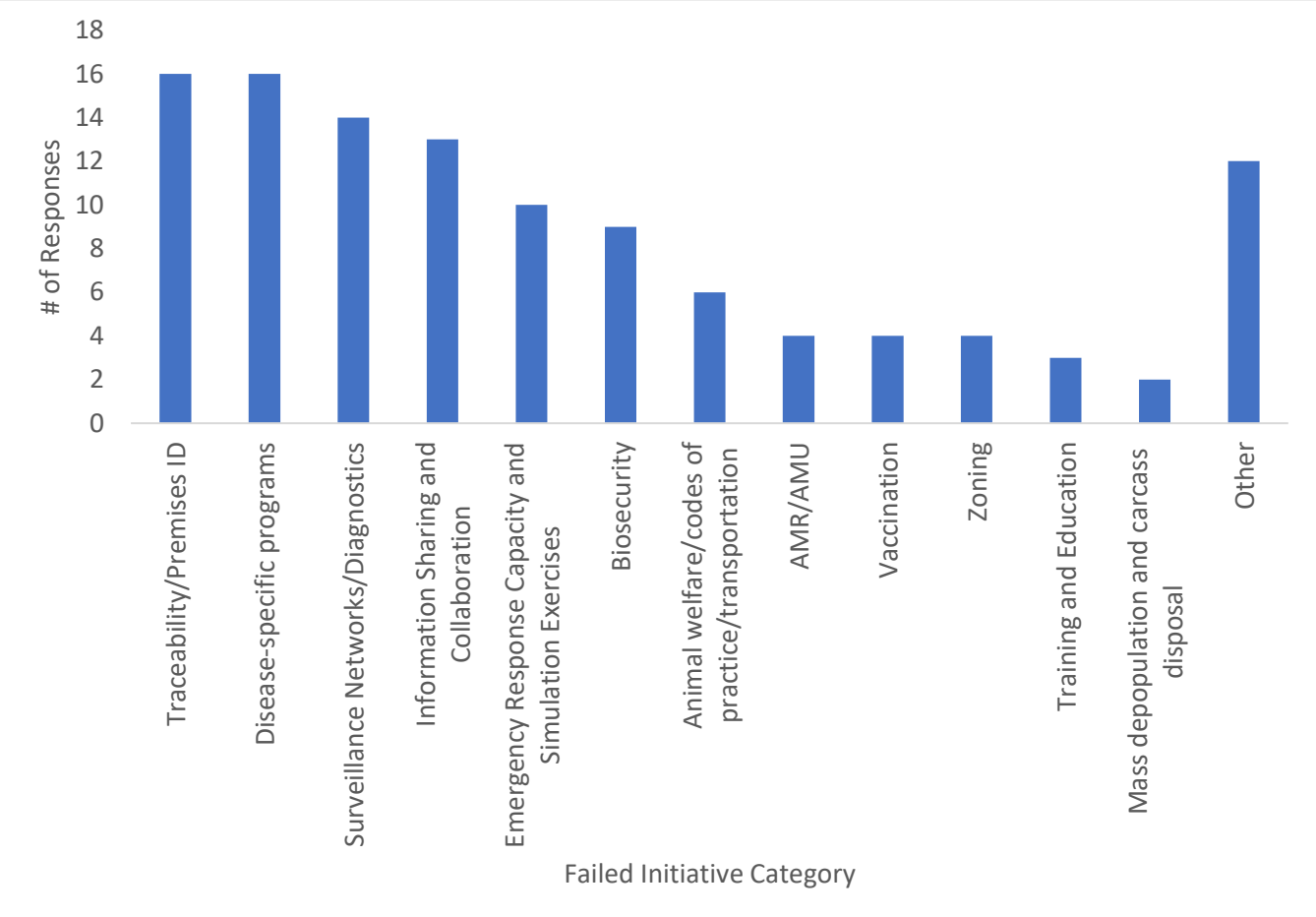


Figure 7. From survey question #4. Failed initiative categories, stratified by the perspective represented by the respondent and shown as the percentage of responses from that perspective group. Categories were sorted in descending order by the total number of respondents.

- Premises ID is a provincial responsibility and is required by some but not all provinces, causing complications or delay in the implementation of federal traceability regulations.
- Zoning for diseases of economic importance is not in place.
    - Linkages needed between federal and provincial zoning that would allow for movement of healthy animals not restricted by federally reportable diseases.
- Standardized disease status across provinces to achieve a more consistent regional status for diseases would make sense geographically. Another possible solution is to include diseases which are currently not on the federal list as a federal responsibility. This would fill the gap in the provinces/territories where there is no regulation to permit reportable diseases.
- Training, education and on-farm protocols are needed for the first critical 24-48 hours after a diagnosis (for professionals and producers).
- There is a need to conduct more simulation exercises (especially for non-poultry species) to make sure we are prepared.
- Emergency preparedness structure needed for species that are susceptible to Foot-and-Mouth Disease.
- Diagnostic Laboratory capacity and co-ordination
    - Limited capacity and lack of laboratory capacity resources in some regions, so samples are sent long distances leading to delays.
    - Lack of staff experienced in FAD response situations to support diagnostic demand.
    - Lack of financial support for the diagnostic lab testing in some situation means that producers bear the cost for testing (which may reduce likelihood of them submitting samples).
    - Many provincial diagnostic labs are struggling to maintain funding and infrastructure, causing erosion of laboratory-based surveillance.
    - On-farm sampling of clinical cases and post-mortems of mortalities (died and euthanized) needs to be done to provide sufficient high-quality surveillance sampling of disease outbreaks to diagnostic labs. Both producers and veterinarians need the tools to properly provide this service.
    - To improve capacity and speed, diagnostic labs should have the ability to perform specific screening tests for selected FADs.
    - Suggestion to bring the lab to the farm by developing (or importing technology) for quick on farm diagnostics.

> *"It's tough to assess if you're prepared enough. If something goes wrong, we weren't prepared enough."*

- There are regions of Canada were there are few to no veterinarians servicing livestock farms, either because the region is remote and farms are far apart, or because there is little agriculture in the region, e.g. in semi-urban regions. This may lead to lack of proper surveillance on those farms to detect disease threats.
- The Canadian Veterinary Reserve has resource limitations. It has never been deployed and training has not occurred for several years. It should be re-evaluated and supported and enhanced, or a different model should be chosen.

- Some animal welfare issues increase in importance during an outbreak. For example, humane euthanasia, and ensuring feed and other deliveries during heightened biosecurity implementation due to disease.

Example of Regional Zoning for Disease Prevention

Honeybee hives in some regions of Ontario are infected with the small hive beetle (SHB), an important pest that degrades honey and predates on bee larvae. The wild blueberry industries of the Maritime Provinces have traditionally relied on importation of Ontario hives to pollinate crops. To prevent introduction of SHB to Prince Edward Island domestic hives, Ontario hives are first inspected by PEI government employees while still in the yards in Ontario and, if no evidence of SHB is found are allowed into PEI and inspected again once set up on fields. As another example of regional zoning to prevent introduction of SHB, the Nova Scotia government recently banned all hives from entering the province.

Response

What's in place?

> *"Lessons learned by CFIA and implemented in the Incident Command Structure helped the 2014 response to Avian Influenza in B.C. run like clockwork."*

- CFIA hazard-specific plans that run through operational protocol for different reportable diseases have helped with understanding roles and responsibilities, especially for the poultry sector.
- Livestock Market Interruption Strategy (LMIS) developed to enhance preparedness to deal with the impacts of a market interruption.
- Producer- and commodity-level response handbooks prepared by the Animal Health Emergency Management (AHEM) team.
- Emergency management structures in several provinces (e.g. Équipe québécoise de santé porcine (EQMA EQSP) and lL'Équipe québécoise de contrôle des maladies avicoles (EQCMA) in QC).
- Provincial avian response plans and command centres (e.g. Feather Board Command Center in ON, EQCMA, BC Avian Influenza response plan) are in place.
- Porcine Epidemic Diarrhea (PED) response plans in some provinces (e.g. AB, MB, ON).
- Beef industry experience with BSE and TB has given the sector relevant experience. Alberta feedlot operators have a Feedlot Emergency Preparedness Plan (FEPP) in place.
- Canadian Veterinary Reserve (CVR) is a national, volunteer membership of specifically trained Canadian veterinarians who make themselves available to rapidly assist governments in emergency response.

Where are the gaps?

- Capacity for carrying out high volume and rapid on-farm depopulation and properly addressing carcass disposal is lacking or non-existent for most species. Survey respondents rated this as the most important animal health emergency management area that Canada is least prepared for (Figure 8, survey question #6).
    - Currently accepted methods take too long and are not adequate for some situations (e.g. large beef feedlot).
    - Plans to ensure humane euthanasia and animal welfare during disease response situations need to be in place before an event occurs.
    - Resources (people and equipment) to perform depopulation need to be rapidly available to mitigate risk of spread of the disease as well as for animal welfare reasons.
    - It's unclear if all provinces have a suitable plan for carcass disposal.
    - Adaptations needed for slaughter facilities to remove animals as carcasses rather than cuts of meat. If an abattoir is used to euthanize exposed or at-risk animals, there needs to be a plan to move those carcasses for rendering when not suitable for consumption.

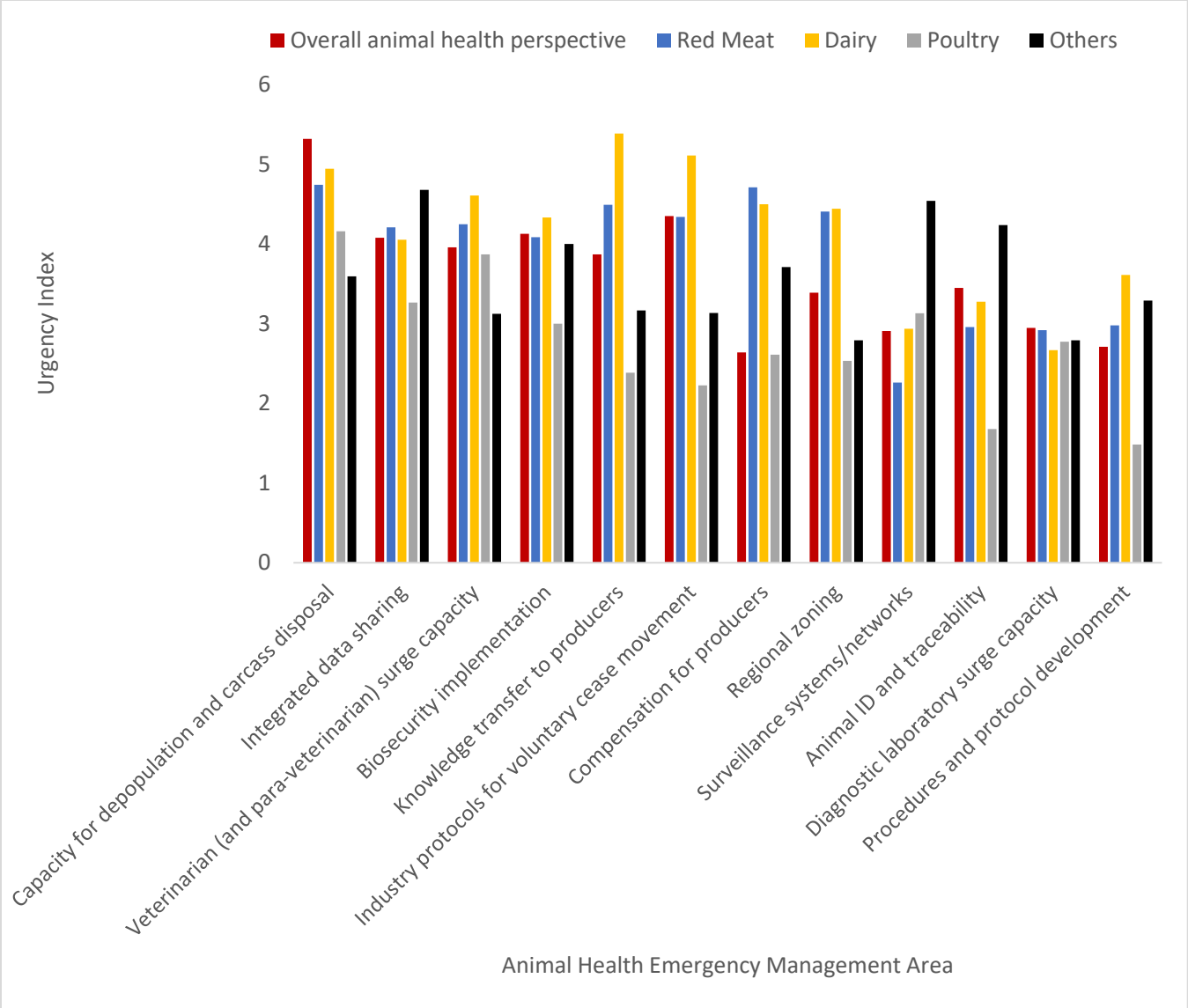


Figure 8. From survey question #6. Canadian Animal Health Emergency Areas (AHEA), ranked by Urgency Index (UI) and stratified by industry perspective. AHEAs are ordered based on the average UIs for each category, across all respondents. The higher the UI, the more critically that AHEA needs addressing. The Overall animal health perspective answered the survey from an overall perspective (not a specific species) (106 responses); the Red Meat category includes those answering from a beef, cervids, goats, sheep or swine perspective (111 responses); the Dairy category had 22 responses, the Poultry category had 41 responses, and the Others category includes the equine industry and all other responses (29 responses). Note that in this figure, respondents were given the choice to enter multiple perspectives, and each entered perspective was counted as a separate response.

- Figure 8 shows the Urgency Index ratings from the online survey separated by respondent group. This analysis reveals several significant differences among survey respondents:
    - Compensation beyond what is covered by CFIA administered compensation (which is coverage for losses related to disease outbreak, including but not limited to payments for infected animals ordered destroyed) for Producers was ranked highly by the Red Meat sector but ranked lowest among respondents who answered from an Overall Animal Health Perspective.
    - Surveillance systems/networks was ranked highly by those answering from an "Other" perspective but lowest among Red Meat respondents.
    - Animal ID and Traceability was ranked highly by those answering from an overall perspective but lowest among Supply Managed respondents
- Lack of in-place plans for decision making on depopulation versus other strategies such as mass vaccination, quarantine, etc.
    - Questions remain about planning such as depopulation vs. vaccination strategy, who will conduct a depopulation, how could this be done for large animals, etc.
    - As with depopulation planning, there is a need to have the resources, equipment and trained personnel to carry out mass vaccination.
    - Need to have a plan in-place to manage a restricted access zone around affected and at-risk farms. This includes a plan to assure animals have adequate feed and water as well as people to care for them

> *"Emergency management is often done off the corner of someone's desk."*

- Emergency response planning and preparedness activities often lack readily available resources; time and budget tend to be focussed on urgent priorities and unfortunately a disease outbreak is not viewed as urgent until it is too late.
- Lack of clarity and understanding around roles for responding to a FAD.
    - Response plans developed by the AHEM team outlining roles need to be put into action at the farm level.
    - Need for a fully integrated and cohesive FAD response plan of roles and responsibilities from the federal to provincial level.
- Pan-Canadian Differences
    - CVOs operate slightly differently in each province; the approach (legislation, regulations, responsibilities, disease lists, etc.) needs to be standardized where it makes sense.
    - Resources and/or mandates are lacking regionally (e.g. Northwest Territories) or by species (e.g. small ruminants).
- Protocols and Procedures
    - Industry protocols needed for voluntary cease-movement to stop movements very early. Disease incubation and spread could be occurring before a federal zone is declared.
    - Need for development and fine-tuning of a permits and licensing system (including enforcement) for essential animal movements during a disease event.

    - Protocols needed for disease-positive premises during and after an incident. There is a need for protocols for impacted producers to follow from the outset of an event.
    - Cleaning and disinfection protocols needed from CFIA in advance of an outbreak, for facilities, equipment, and vehicles.
    - Regular pick-up and delivery (feed delivery, deadstock removal, etc.) protocols for different zones to ensure that biosecurity is maintained for farms in different zones (e.g. infected zone, restricted access zone, secure zone and disease-free zone).

> *"There are regions of Canada, e.g. the Prairies and northern Ontario, with very limited access to large animal veterinarians, making access to timely and informed diagnosis of FADs problematic."*

- Both human and financial resources for response are stretched thin.
    - Many response plans rely on one person (in part due to lack of people resources and lack of network with which to share/transfer knowledge).
    - Increased veterinary reserve capacity needed and veterinarians who are familiar with CFIA procedures.
- Project-based work means that initiatives are often not maintained once projects are completed.
- Privacy laws and concerns result in withholding of information that may cause delays.
- Digital technology (communication and data sharing) has the capacity to allow for immediate disease response communications but is underutilized

Veterinary and Para-Veterinary Capacity

In Canada, we have a shortage of veterinarians with livestock experience and the shortage is even more severe when also considering experience in disease control / eradication programmes requiring high levels of biosecurity. The Canadian Veterinary Reserve initiative trained over one hundred veterinarians in the first decade of 2000 but the CVR has not yet been called to active duty, and no training has occurred in several years.

In the event of an FAD outbreak there is a need for a higher number of trained personnel than could be reasonably supplied by Canadian veterinarians. Regardless of the availability of the CVR, veterinary paraprofessionals could be trained, using the guidelines developed by the World Organization for Animal Health (OIE) "OIE Competency Guidelines for Veterinary Paraprofessionals.

A paraprofessional could be a veterinary technician (RVT, veterinary nurse) or possibly more capacity could be derived from trained agricultural workers. Administration of vaccines, sampling and sample handling, animal restraint, record keeping, laboratory support etc. could all be done when either directly or indirectly supervised by a veterinarian. Another suggestion may be to explore accessing veterinarians and veterinary paraprofessionals from other countries to provide specific services for a limited time.

Recovery

> ***"Compensation for the farmer leads to all the right behaviours*** *– such as self-quarantine, making sure something doesn't move on or off the farm…this is huge."*

What's in place

- CFIA administers Animal Health Compensation under the Health of Animals Act which may provide compensation for infected animals ordered destroyed. This encourages the right behaviour by producers in the event of a FAD issue.
- Development of the LMIS led by AAFC helped to mobilize industry and government stakeholders. Objectives of the national strategy are to manage industry transition during a market interruption, facilitate resumption of international trade and maintain domestic consumption.
- Business risk management (BRM[11]) programs include protection for aspects of revenues (AgriInsurance and WLPIP), operating income (AgriStability, ASRA, RMP), incentives for savings (AgriInvest), compensation for product ordered quarantined or destroyed (Health of Animals Act),
- Funding for the out of pocket or ongoing costs to recover/rebuild capacity from an animal health disaster impacting a region or group of producers collectively (AgriRecovery and FPT Disaster Support).
- Increasing awareness and resources (e.g. farm stress lines) being put in place for mental health support for both impacted producers and responders. The NFAHW Council, the work of Dr. Andria Jones-Bitton (University of Guelph) and the UPA in Quebec have been active in mental health supports.

Where are the gaps?

- Zoning agreements with trading countries, other than Europe and the U.S., need to be established.
- Broader communication about the LMIS and risks we face will help bring this issue to the forefront.
- Need to conduct regular simulations of a FAD outbreak and disease diagnostic capacity to make sure response plans are working and continually improve.
    - Include meat and dairy processors in these simulation exercises.
    - Include feed suppliers, transporters, assembly yards and livestock sales barns, etc.
- Financial assistance for producers is needed on day one of an outbreak.
- Financial support through risk management programs or compensation for operations not eligible for CFIA administered compensation should be considered for others in the supply chain, such as processors.
- Financial support for economic welfare slaughter/euthanasia needs to be clearly communicated to producers (both positive and healthy animals caught in impacted zones) to ensure humane treatment of animals if markets are closed.
- Compensation for infected animals ordered destroyed and valuation modeling need to be based on recent market values.
- Cleaning and disinfection costs of a facility or operation could be significant and currently are not included as part of CFIA administered compensation; need to look at options to cover this (perhaps insurance?).

[11] Additional analysis is provided in the Risk Management and Recovery Tools section of this report

- Ad hoc programs for livestock disease emergencies and response are difficult for governments to plan and budget for, they are not certain (or "bankable") for producers and tend to lack an incentive structure in program design
- Cost-sharing (e.g. pre-existing cost-share formula to apply in a FAD event as well as cost-sharing for implementing biosecurity, traceability, etc.).
- Mental health support for producers and service providers involved (e.g. veterinarians) is an area where gaps exist and improvement is needed. Some provinces have done more in this area than others and there is room for growth and improvement.

Assessment and Conclusions

The consultation revealed many strengths and success stories related to animal health emergency management in Canada. However, when looking across Canada and at all livestock species, many gaps and structural inefficiencies do exist. The following is a summary and analysis of the main gaps revealed during the consultation:

Organizational and Structural Gaps

Overall, the largest gap is the lack of a cohesive national approach that can provide stronger FPT government -- industry collaboration. The current fragmented structure leads to inefficiencies, missed opportunities for synergies and slower decision making. The end result of the current structure is increased risk and overall cost for both government and industry.

Structural and organizational gaps of the animal health disease management system revealed by the consultation and our analysis are:

Government and industry decision-making partnership

Consistent with the Plant and Animal Health strategy findings, this consultation reinforced the opportunity for an improved industry/government partnership in all aspects of animal health risk management, emergency response and recovery. The overarching gap in this area is that a **cultural shift** is needed from current roles to more of a team approach that can "co-manage" animal disease issues while still respecting regulatory authority.

While there are some great examples where this *team approach* does exist due to relationships that have been built, several industry stakeholders voiced the desire for a more collaborative approach with regulators to ensure transparent government-industry communication and co-ordination to tackle issues quickly, gain market access and reduce animal health risks. The ASF Executive Management Board and its related activities have solidified the value of increased collaboration between the Federal government, Provincial/Territorial governments and industry.

*Requires a **cultural shift** to more of a team approach that can "co-manage" animal disease issues*

Fragmented authority and responsibilities

The consultation revealed several examples where roles and responsibilities are not clear between Federal, Provincial and industry stakeholders. At the same time, federal government stakeholders generally indicated that roles and responsibilities are clear from their perspective.

For example, more clarity is needed around Federal, Provincial/Territorial and industry roles for reportable and notifiable diseases. The current framework is complex in that CFIA has the mandate for Federally inspected processing plants including animal welfare during transportation, however the Provinces/Territories are responsible for on-farm animal welfare, on-farm food safety, auction markets, assembly yards as well as provincially inspected processing plants. Other questions raised during the consultation for some species include: stop movement orders (who enforces), carcass disposal environmental impact (who has jurisdiction) and zoning (who defines and enforces regional zoning).

In addition, it appears that some of the past emergency management successes were based on relationships between individuals and/or the dedicated efforts of a few individuals, not necessarily on a formal structure or policy. Future success is not assured without a more formal and clear approach and delegated authority to the appropriate levels where action is required. Building relationships over a very large country has to be done strategically and explicitly.

"Largely we depend on relationships and trust happening themselves, not strategically."

It is apparent that there are vast differences in level of preparedness across species within Canada. While this is to be expected to some extent due to the varying nature of sub-sectors, it appears that in many cases, there is not a significant level of sharing knowledge and/or resources across various species groups especially at the industry level. Despite several common connections such as CFIA and CCVO, the system overall lacks a cohesive structure that enables the most efficient knowledge transfer and resource sharing across animal species. Additionally, smaller sectors may lack the resources needed to participate in these activities or even to develop related programs for implementation on-farm.

Communication challenges

There is a complex system of networks and organizations that make communication and co-ordination a challenge. Effective communication is difficult in today's fast-paced world both within a large organization and when trying to connect with external audiences. This is compounded given the diversity of the sector across different species and by provinces/territory/region. The sector is lacking a cohesive structure for information and resource sharing across species and the supply chain. Recognizing that communication is a core need that

requires forethought, a strategic approach and adequate resources are key success factors to advance prevention, preparedness and effective response.

> *"The real question is, how do we get the communication to work for everyone involved?"*

Integrated data and information sharing

Somewhat related to communications, more integrated data management for all aspects of disease management would have a strong and lasting benefit to the sector. Gaps include surveillance - active and passive, animal/premise ID, traceability, animal disease diagnostic laboratory services and audited on-farm food safety programs. The OIE PVS report in 2017 for example indicated that "data handling could be improved with greater use of integrated databases to provide more timely and enhanced information…". Previous efforts to combine National databases across species have failed. Taking a species-by-species approach may be the most practical approach forward. Replacing paper-based systems with electronic digital systems should be the highest priority.

Speed in decision making and action

Speed matters in effectively managing disease outbreaks and when dealing with market access issues, just to name a few examples. Accelerating decision-making, despite the complex network of stakeholders and jurisdictions, is needed to keep pace with the speed of business and reduce risk for the sector. Speed in decision making may lead to errors in some cases – but accepting some risk for the sake of timely action will mitigate overall costs to the sector.

> *"Acknowledge that speed comes with some risks, and accept those risks. Stops the paralysis of indecision."*

Planning, prevention and simulation activities are sometimes delayed due to slow decision-making or delays with government funding approvals, which put the sector at even greater risk despite best efforts to prevent disease issues.

Lack of alignment across Provinces/Territories

There are major differences in preparedness and response capabilities amongst provinces and territories, depending on the size of the sector and resources available within each province or region. Examples include differences in Health of Animals Act legislation, and as outlined in the OIE PVS report in 2017, differences in regulation, authorization and inspection of provincial slaughterhouses. Solving these provincial differences is a significant challenge; however, the current situation also creates higher risk for the livestock and meat sector as a whole.

A clear example of these provincial differences is evident when looking at lists of reportable and notifiable diseases list for each province.[12] These differences create confusion and may not take into account the economic significance of the disease for the industry in other provinces. While provinces and territories have the ability to legislate actions above and beyond the federal standards on any and all livestock diseases, all disease lists should be developed in consultation with other provinces and national representatives of the affected livestock industries on a regional basis (West/East at a minimum). Part of the solution could also be expansion of the federal disease list.

[12] CAHSS reportable disease list https://www.cahss.ca/media/uploads/documents-public-page-links/documents/18-10-09_17-12/CAHSS_Reportable_Diseases_0_Dwistid.pdf

Organization and initiative confusion

Animal health in Canada is managed by many different organizations and networks – the list of organization acronyms is vast. As outlined earlier in this report, this assessment follows a long history of reports and strategies related to this complex and ever-evolving topic. Some respondents in the consultation asked "why are we doing another study or another strategy? We need to get on with it". There is a general sense of consultation fatigue among industry members.

Similarly, several of the consultations group calls revealed confusion around the various organizations and their mandates. There is a real opportunity to rationalize the number of organizations, coalitions and initiatives under the AHC umbrella. This would add clarity and transparency to the process and promote agility in response to animal health issues.

Recommendations and Key Success Factors

Key success factors

- Purposeful integration of industry into the decision-making process (without impacting government's regulatory autonomy).
    a. Incorporating industry into a joint FPT government partnership will help in ensuring clear and timely three-way communication (real time, back and forth).

- Authority, roles and responsibilities need to be clear for all stakeholders.

- Trust, openness and higher levels of transparency (information sharing) are required to effectively co-manage issues.

- Communication to stakeholders needs to be clear, consistent and simultaneous for both Federal and Provincial/Territorial networks.

- Improved co-ordination of existing efforts and groups across Canada and across animal species is an opportunity that will bring efficiency gains.

- Flexibility and agility are needed across the entire system to be able to respond to issues as the disease risks change in the future.

- Effective response will be a combination of data/information as well as practical knowledge and understanding of the environment. For example, incident command centres should include people with hands-on experience in that production area.

Recommendations to improve organization and structural gaps:

1. **Create a national umbrella organization:** We recommend that a central organization be the national umbrella organization for animal disease management and animal welfare.

   The consultation and analysis revealed an extremely complex system including many organizations, coalitions, initiatives and networks all with slightly different, but similar mandates and topic areas. In addition, there is overlap on topics such as animal welfare, disease prevention and anti-microbial use, yet these are handled separately in some cases.

   a. The scope should take a holistic approach to co-ordinate activities at the national level for:
      i. Animal disease management (prevention, preparedness, response and recovery including emerging and endemic diseases)
      ii. Surveillance
      iii. Antimicrobial use/resistance
      iv. Animal welfare
   b. Rationalize the number of organizations, coalitions and initiatives under one (or fewer) umbrella body such as the Animal Health Canada umbrella to improve connectivity, communications and efficiency.

An observation from the consultation feedback is that the Animal Health Canada concept can move the FPT government and industry to the next level of partnership – to be "Collaborators" rather than seeing industry as just a stakeholder. Additional explanation of this progression is outlined in Appendix 5: Progression Toward the Ideal Partnership Model of this report.

Detailed recommendations for the form and function of this organization will be investigated during the governance project which is now underway.

2. **Reduce provincial differences:** There are major differences in legislation, preparedness activities and response capabilities amongst provinces and territories depending on the size of the sector and resources available within each province or region. Yet, animal disease issues can have negative impacts that cross provincial boundaries and result in national issues (and national liability).

   In some cases, it may be more appropriate to manage some diseases or issues at the Federal level rather than at the Provincial level. The scope of Federal areas of responsibilities does not encompass the entire spectrum of diseases or issues. This means that Provinces have to step into these areas (such as managing diseases that are not CFIA-reportable), but with different means and regulations in each Province, this leads to inconsistency.

   At the Provincial level, the goal should be to achieve a high level of readiness with as much uniformity and harmonization as possible. Provinces should all be working toward consistency and resource sharing across all aspects of PPR&R activities. If national consistency is not possible in the short term, then working toward more of a regional approach will help to reduce provincial differences that are causing confusion and increasing disease risks. For example:
   a. Harmonize the Health of Animals legislation in all provinces.

   b. Organize infrastructure and resources, such as laboratories, based on regions to increase efficiencies and where provinces are not able to sustain their own independent facilities
   c. Reduce provincial differences in reportable/notifiable disease lists by taking a national or at least regional approach for each disease, etc.

3. **Focus on diseases that matter:** The estimated negative economic effects of animal disease outbreaks, especially epidemic reportable diseases, is staggering. Our analysis of economic impact revealed that any significant livestock disease, whether reportable or strictly production limiting, resulted in negative economic effects measured in hundreds of millions of dollars.

   Currently, there are some animal diseases that are considered non-reportable in one or a few provinces but are reportable/notifiable in another province. Building on the previous recommendation to harmonize reportable disease lists, we also recommend using a risk-based approach to assess and then focus on the diseases of significance (considering human and animal health impacts as well as the economic effects) whether or not they are reportable, notifiable or non-reportable.

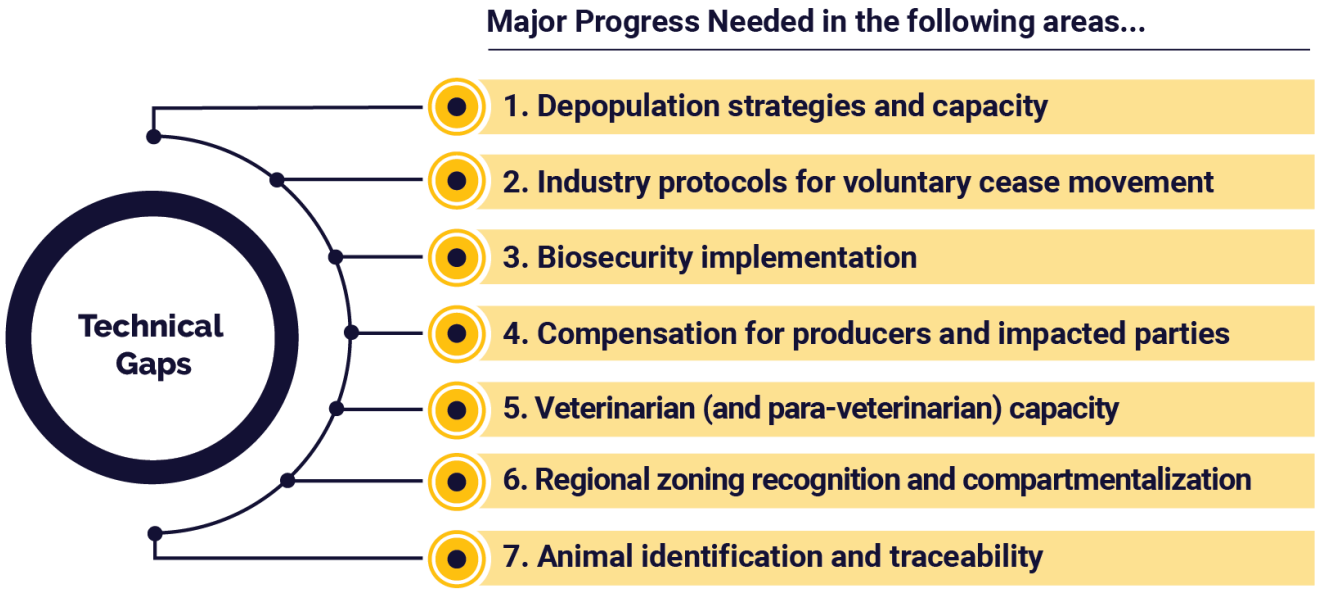
4. **Increase Disease Emergency Simulations:** Simulations of disease outbreak emergencies are key to ***making it real*** for everyone involved. Getting into the details of how a disease outbreak will be managed is needed so that there can be a clearer understanding around roles for responding to a FAD. Implementing improvements based on learning gathered during simulations or table top exercises will greatly improve preparedness. These exercises will also increase people capacity within both government and industry. In short, practice makes perfect.
   a. Mock recalls and corrective actions are a requirement for food safety at food processing plants. This practice should be extended across the supply chain for animal disease response simulations.
   b. Simulation exercises should include cease movement, permit issuance, zoning and market access.
   c. Simulations should include testing protocols to ensure board and multicommodity application
   d. Simulation exercises should include testing communication protocols for all audiences; farmers, processors (both Federal and Provincial), stakeholders in the supply chain, the media and the public.
   e. Involvement from impacted parties across the supply chain is key – such as processors (Federal and Provincial plants), transporters, feed suppliers and livestock auction markets.
   f. Implementing recommendations from previous “lessons learned” reports will also improve preparedness and reduce risk for the sector.

5. **Strengthen Communications and Education**: Communication across all stakeholder levels, but in particular at the producer and supply chain level, was indicated to be a major gap. While there has been great progress in these areas and producer organizations have really "stepped up to the plate", there is a need for continued work and investment in this area. This is not a surprising to some given the complexity of the topic and the network of stakeholders involved. Communication needs to be recognized as a core priority that requires forethought, a strategic approach and adequate resources to be effective. Communications and knowledge transfer activities have three main components that should be in place for each sub-sector/species:
    a. **Prevention Awareness** - Communication strategies to increase awareness and understanding of the importance of prevention activities (for example, supporting the importance of consistent biosecurity implementation, at all points in the chain, etc.). Enhanced biosecurity in times of emergency is easier to implement if biosecurity is already being practiced.
    b. **Disease Response Education and Training** - Educational resources and training programs to increase understanding of disease risks, how the different classifications of diseases are to be handled, including response protocols and procedures.
    c. **Disease Response Communications Protocols** – Communications protocols for disease response should be reviewed and tested to ensure that all stakeholders receive information in a timely manner. Communications in a response situation need to be clear, consistent and simultaneous across all levels of the supply chain and governments.

Technical Gaps

Major Progress Needed

The following technical gaps have been identified as Major Progress Needed, where efforts have been begun but insufficient results obtained. It is important to mention that **though the gaps below have been ranked in order of importance, all areas are critical and interrelated, and each must be addressed.**



The AHEM projects are helping address several technical gaps, including Procedures and Protocol Development and Communications and Knowledge Transfer. It is important that this work continues to move forward in addressing technical gaps.

1. Depopulation strategies and capacity

Clarity is needed on the appropriate response strategy for some diseases; such as whether to depopulate to eliminate a disease or implement a vaccination strategy instead. Capacity for high volume and rapid on-farm depopulation is lacking or non-existent for most species. The lack of depopulation capacity is seen by some as "a crisis waiting to happen". Processing plant capacity was mentioned as a gap or "risk area". Currently accepted euthanasia methods for one sector may not be considered workable or practical to perform for some sectors when mass euthanasia is required (such as beef feedlots).

> *"Lack of capacity for high-volume and fast on-farm depopulation make this a crisis waiting to happen."*

2. Industry protocols for voluntary cease movement

Voluntary Cease Movement capability is needed to avoid the spread of a disease outbreak in the first few days of an outbreak, in advance of provincial and subsequent federal restrictions. Quickly stopping movements within a local zone to minimize disease transmission is a key gap area that needs attention. Authority to issue stop

movement orders by the Province is reportedly in place for some, but was highlighted as a significant and urgent need by several stakeholders. Emergencies may not be in one province/territory only. A review of federal legislation could also be an avenue, and be implemented through FADES plan agreements.

3. Biosecurity implementation

> *"Biosecurity is only as good as the "weakest link" in the chain."*

Biosecurity implementation at the farm level and at other points in the supply chain is reported to be working well for some species but is a gap for others. Specifically, the most significant gaps in biosecurity are for several species: beef (both cow/calf and feedlot), sheep, goats, small scale herds and feral swine. However, continuous improvement and a year-round focus on biosecurity is needed for all species and all points in the supply chain. Auction markets and livestock transportation were also identified as areas for improvement in biosecurity.

It is important to recognize that disease prevention with biosecurity is compromised by weak links in the chain. If there are "weak links", strong biosecurity implementation in other areas takes on increased importance. For example, if one doesn't know the health status of additions to the herd or flock, then isolation on arrival is even more important.

Beyond the farm gate, measures such as vehicle biosecurity during transport, lack of truck clean-out and disinfection for ruminants, little to no capacity to implement biosecurity at most auction markets, and gaps at Canada's ports of entry are all part of the picture.

4. Compensation/reparation for producers and impacted parties

Clear and well understood compensation or reparation due to loss as a result of disease is key to encourage the "right behaviours" among producers who are impacted by an animal disease outbreak. Reparation for losses needs to be clear, available quickly and calculated based on up to date information. While the Heath of Animals Act compensation administered by CFIA provides this for producers directly impacted, the consultation revealed a gap for nearby producers (those who are impacted but do not qualify for CFIA administered compensation) as well as other in the supply chain such as processors. The online survey responses highlighted differing views on the urgency and need for improved compensation or reparation of loss for producers:

- Producer Organization and Processors respondents Urgency Index rank: 3.91 (4th out of 12)
- Veterinary and Lab Services respondents Urgency Index rank: 3.56 (7th out of 12)
- Government respondents Urgency Index rank: 1.53 (12th out of 12)

Enhanced risk management programs or insurance programs for impacted parties should be considered as a proactive way to enable business continuity in the event of a disease outbreak.

5. Veterinarian (and para-veterinarian) capacity

Lack of veterinary services capacity with experience in livestock and/or disease control program requiring biosecurity was mentioned as a key gap. Understanding the realities of livestock production in rural Canada is important to effectively work with stakeholders in emergency situations. In the event of a foreign animal disease (FAD) outbreak there may be a need for a high number of trained personnel to be deployed quickly to deal with the emergency. Stakeholder suggestions include revitalizing the Canadian Veterinary Reserve and/or training veterinary paraprofessionals such as Registered Veterinary Technicians using the guidelines developed by the

OIE. In addition, the Canadian Council of Veterinary Registrars are reportedly looking at ways to more easily licence vets from other jurisdictions in the face of an animal health emergency.

6. Regional zoning recognition and compartmentalization

The need for regional zoning and international recognition of zoning was one of the most acute gaps raised during the consultation. Canada has significant market access risks until changes proposed by CFIA and other countries are accepted by the World Organization for Animal Health (OIE), enabling uninterrupted or quickly resumed trade from unaffected regions. While progress has been made by the Government of Canada and some key countries, there is more work needed to achieve success. Responsibilities and communication protocols are needed to link Federal and Provincial zoning so that they are more comprehensive and co-ordinated.

A concern was also raised about the ability to quickly implement adequate zoning for some species. Effective zoning requires the right biosecurity and traceability to be in place. Even if a disease isn't reportable to Canadian Food Inspection Agency (CFIA), there is still need for a national plan to prevent disease spread for both economically important and reportable diseases.

Compartmentalization of a specific supply chain under a common biosecurity management system with a distinct health status should be investigated as a future opportunity to maintain trade.

7. Animal identification and traceability

The three pillars of traceability are: mandatory livestock premises identification through a provincial or national registry, electronic animal identification and movement reporting.[13] Although animal identification is in place for beef, dairy cattle, sheep and bison, it is not required for goats and cervids and is a gap for small scale livestock. Swine traceability through the PigTrace system and flock traceability in the poultry sector are two exceptions. Consultation feedback included the need for improved digital systems and other improvements, but also highlighted the challenges involved in implementing traceability and movement-tracking systems on a broad scale. Lack of knowledge and producer/rancher buy-in on the value of and need for traceability was also mentioned as a gap, as well as traceability through the value chain, including abattoirs.

[13] http://www.inspection.gc.ca/animals/terrestrial-animals/traceability/eng/1300461751002/1300461804752

Continued Progress Needed

The following technical gaps show progress and development in the recent past; however, more investment is needed. They have been identified as Continued Progress Needed. It is important to mention that **though the gaps below have been ranked in order of importance, all areas are critical and interrelated, and each must be addressed.**

1. **Communications and knowledge transfer**

Communication, training, and transfer of knowledge of on-farm programs from national/provincial commodity groups to producers, transporters and other stakeholders is an area of strength. While many producer organizations have "stepped up to the plate", this area requires on-going effort. **Shifting the culture of the industry to understand and embrace prevention, preparedness and response principles is needed for long term success**. A specific example is providing producers with information on what to do (or not do) in a disease outbreak both in advance of and at the time of the event. A key communication challenge is the need to reach everyone in the system, not just to the keen and committed.

Knowledge transfer and training requirements are also needed beyond the farm gate, such as with livestock auctions barns, assembly yard operators, transporters, feed suppliers and veterinarians. For example, piloting incident management training and courses for veterinarians will help build capacity.

2. **Surveillance network integration**

Surveillance systems were mentioned as both a strength and a gap that needs more time and investment (i.e. long-term program support) to ensure stability and demonstrate success. Fragmented surveillance systems would be enhanced through better coordination or by being combined into one effort. For example, there are provincial systems, industry systems and surveillance by the Public Health Agency of Canada. Coordination of regional surveillance systems is also needed at the national level. There is a need to strengthen laboratory diagnoses of specific diseases by performing passive surveillance in fallen stock on farm and upon arrival at auction markets and abattoirs.

3. Diagnostic laboratory capacity and regional approach

Development and co-ordination in the federal/provincial veterinary diagnostic lab network (CAHLN) have been very positive, however reductions in funding or unstable funding put this progress at risk in some cases. Some regions report having sufficient surge capacity to handle large increases in sample volume in the event of an outbreak, but many areas, such as Prairie Diagnostic Services, reportedly lack the surge capacity that may be required in an emergency. Atlantic Canada stakeholders also reported limited lab capacity. Provinces with smaller livestock populations face the challenge of limited capacity and lack of resources which causes delays in sample analysis and hampers efforts to prepare and respond. Similar to other aspects of animal health, a regional approach with nearby provinces working together is the ideal approach rather than having a province-by-province approach.

4. Procedure and protocol development

Significant progress has been made to develop protocols, such as the Animal Health Emergency Management (AHEM) team's work to prepare producer level handbooks and resources for commodity organizations. Proactively having protocols in place to assist impacted producers and others in the supply chain is needed so that they are in place right from the outset of the response. Several gaps that require continued work in this area include: on-farm protocols for changes to animal flow, changes to assembly yard configuration, cleaning and disinfection of equipment and facilities, equipment segregation protocols, etc.

5. Canada – US regulatory alignment and co-operation

Canada and the United States have a strong trade partnership and many aspects of their livestock sectors are integrated. However, despite this integration at the industry level, there is room for improvement to better align regulatory systems and border controls. Greater cooperation and alignment with the US, as a key trading partner, will bring regulatory efficiencies and potentially increase access to emerging technologies, products and processes.

Recommendations to improve technical gaps:

1. **Form an Executive-level task force:** The recently established African Swine Fever Executive Management Board has been viewed as a very positive move to prepare for that risk. It appears that many aspects of the Management Board's work are transferable to other sectors and livestock types. This Management Board also seems to have an effective level of authority – decision makers and influencers are at the table. To capture the full value of this work, it might be possible for the Executive Management Board to expand its scope beyond ASF. Alternatively, a group with similar structure and function could be created to tackle the technical gaps identified in this report.

   We recommend that a task force with a similar level of authority as the ASF Executive Management Board be formed to assess and determine actions and next steps for each of these technical areas.

2. **Identify one or two highest priority gaps:** The highest priority gaps should be identified based on the gap analysis and survey results. The Urgency Index developed using the Importance and Readiness rankings could be used to help inform this, or another index related to highest risk diseases may be useful.

3. **Develop an action plan:** An action plan outlining roles and responsibilities for the top one or two issues will help ensure progress.

Legislation Gaps

A number of gaps in provincial verses federal legislation and authority were identified during consultations with federal and provincial stakeholders. These gaps create limitations in the legislation that protects animal health and welfare.

Specifically, identified gaps include:

- Regulatory authority for non-reportable diseases:
    - For diseases where the federal government does not take a role (i.e. federal non-reportable diseases), any potential regulatory authority may fall to the provinces and territories if the jurisdiction has developed legislation to address these federally non-reportable diseases. With variations in the provincial Health of Animals acts, diseases are not handled the same way from province to province. In addition, provinces also can have regulatory authority on federal reportable diseases (e.g. in Quebec, all federal reportable diseases are also provincially reportable). As indicated by the results of the gap analysis survey, this leads to confusion by stakeholders (e.g. government, industry and others) over roles and responsibilities for handling diseases that are not federally reportable yet still have significant economic impact (see Appendix 4: Survey Results). This negatively impacts response times when there is a new emerging disease that may not be reportable or notifiable either federally or provincially. A clear process to determine how a disease is to be handled is needed. For example, PED, Infectious laryngotracheitis (ILT), Johne's Disease and Seneca Virus A (Seneca Valley Virus) are handled by the provinces, but with different responses in different provinces. Additionally, case definitions or criteria for positive diagnosis of various diseases are inconsistent between provinces. A standardized approach to these and other diseases of economic impact would be worthwhile.
    - Another issue resulting from this legislation gap is the criteria for when an emerging disease becomes endemic. Gaps in responses and determination of when diseases are considered endemic vs emerging are legislative but may also be because of industry behaviors and attitudes. Regional consistency in case definitions and diseases statuses would go a long way towards harmonizing and increasing efficiencies in disease response.
- Variation in Provincial mandates for Chief Veterinary Officers:
    - Each province has a CVO or equivalent with responsibilities for disease surveillance and disease control, and sometimes for food safety and animal welfare. While there may be very good reasons for differences in CVO mandates, a harmonized approach - where it makes sense - would be advantageous.
- Premises identification and traceability
    - Premises identification is a provincial responsibility to fulfill national livestock traceability obligations, with some provinces mandating it, and other provinces where it is optional. Alberta, Manitoba, Saskatchewan and P.E.I. have mandatory provincial premises ID programs, and British Columbia has proposed regulatory changes to make premises ID mandatory in the province and is currently reviewing feedback form the public and stakeholders. The remaining provinces operate with voluntary reporting systems. These discrepancies have caused delays in implementation of full traceability or movement reporting from one premises to another. If a premise is not identified, animal movements onto that location can not be accurately reported to a responsible administrator (e.g. CCIA) recognized by the CFIA. Inconsistencies in premises ID

requirements across provinces have led to delays in the implementation of full traceability compliance under Part XV of the Health of Animals Regulations
    - In terms of animal movements, B.C., Alberta, Saskatchewan and Manitoba currently have provincial requirements for information to accompany livestock when animals are moved from one departure site to a destination site. Both of these sites should be registered with a premises ID. Full traceability for bovine, ovine and cervids is regulated in Québec.
- Carcass disposal
    - With the exception of disposal of Specified Risk Materials, which is mandated federally, carcass disposal is provincially regulated. Plans for disposal of both diseased and non-diseased animals must respect provincial regulations. The lack of plans (whether federal or provincial) may be a gap or the lack of clarity about whether plans are in place may be the gap.
- Regulatory authority for meat processors and livestock intermediate sites
    - CFIA has the regulatory authority for Federally inspected processing plants, however the Provinces/Territories have regulatory authority for provincially inspected processing plants, auction markets and assembly yards. There are also cases where federal plants must also adhere to provincial regulations.
    - Another area for potential confusion is that intermediate sites such as auction markets and assembly yards are under provincial authority for animal welfare, however CFIA has regulatory authority for animal welfare during transportation. The new federal humane transport regulations may help simplify and clarify some areas, for example where handoff from transporter to care-giver at abattoir/assembly/auction must be clearly documented.

Several provinces have recently updated their Animal Health legislation, and others are in the process of review and updating their animal health legislation. As provinces review/update animal health legislation, the provinces/CVOs are to some degree sharing information about respective legislation, strengths and challenges. This process is not coordinated across governments though, and it is not clear which provinces are actively updating animal health legislation.

A CVO working group is in the initial stages of reviewing the animal health legislation across provinces through a jurisdictional scan. Reduced provincial differences across regions - where it fits into the context of each province - would help reduce confusion over roles and responsibilities for disease response. Animal disease responses developed in a regional context with alignment of outcomes and intent would mean that each province can use the available tools to achieve the outcomes, resulting in improved efficiencies and response times.

Risk Management and Recovery Tools Overview

This section provides an overview of the range of public support instruments available to address and recover from animal health-related risks and emergency events. Following the description of tools, we provide observations on potential gaps in tools and policy.

Overview of Business Risk Management (BRM) Programs

Canadian Agricultural Partnership (CAP)-Supported Tools[14]
AgriStability
Purpose: AgriStability is a federal-provincial joint program that compensates producers for losses in farm income. While the loss calculations are based specifically on farm income and margins, coverage is provided regardless of the cause of the income/margin loss. **Criteria:** When a farm's production margin (eligible revenue less eligible expenses) falls below the reference production margin[15] in a given year, a loss in income has occurred. This program covers losses up to 70% of the loss in margins (both positive and negative) incurred on individual farms so long as the loss exceeds 30% of the loss in margin. Maximum payments are $3 million per farm and minimum payments are $250[16]. **Notes:** The program is integrated at the whole-farm level with AgriInsurance (crop insurance) since any indemnities paid under AgriInsurance, as well as any indemnities that would have occurred whether or not the farm had taken AgriInsurance coverage, are included in revenue in the AgriStability calculations[17]. Program funding is shared by federal (60%), and provincial and territorial governments (40%).
AgriInvest
Purpose: The purpose of the program is to encourage each year producers to set aside some of their income to deal with any losses or investment opportunities that may arise on the farm and allows the producer a proper self-management of risks. AgriInvest provides a government payment into an account held by the producer. The payment is equal to one percent of the eligible net sales[18] of the farm, and must be matched by the producer. **Criteria:** The producer can deposit greater than one percent into the account but only the first one percent is matched by governments. The funds from governments are held by the producer in a separate account from the deposits by the producer. The producer deposits are based on after tax income for the farm, and when withdrawn, are non-taxable. The government funds and any income/interest earned on the government account are taxable as investment income when withdrawn. **Notes:** Producers are not required to withdraw funds, and they can do so whenever they wish. The maximum payment by governments in any year is $10,000, that is, based on $1 million in eligible net

[14] Agristability is administered federally, except Quebec

[15] Producers participating in AgriStability use their own reference over time, based on income tax information, for the purpose of comparing current vs Olympic margins and determining program payments. New producers without a margin history can access industry benchmarks to develop references.

[16] In the case of participants applying late to join AgriStability, as of 2018 additional fees apply, and a reduction of 20% is assessed against any payments triggered.

[17] AgriInsurance is focused on crops, but directives exist for livestock production insurance

[18] Eligible net sales include all income from farm sales less any purchase of farm products.

sales[19]. The maximum balance in AgriInvest accounts is 400% of a farm's allowable net sales. Program funding is shared by federal (60%), and provincial and territorial governments (40%).

AgriRecovery

Purpose: Initiatives developed under the AgriRecovery Framework help producers recover from disaster, by providing financial assistance for the extraordinary costs necessary for recovery. Extraordinary costs are those which producers would not incur under normal circumstances, but which are necessary to:

- Mitigate the impacts of the disaster; and/or
- Resume farming operations as quickly as possible following a disaster

Criteria: AgriRecovery is not a "program" – it is a framework by which federal, provincial and territorial governments work together to assess the impacts of disasters on agricultural producers and respond with joint initiatives where there is need for assistance beyond what is available through existing programs. AgriRecovery is often delivered by the provincial/territorial delivery agent, but in some cases is delivered federally.

Notes: AgriRecovery does not cover production or revenue declines covered by other programs [19]. In general, the framework appears to cover extraordinary costs related to abnormal, non-recurring events to resume the farm business operations. The framework is limited to providing for a maximum of 70 percent of the costs of recovery associated with the event. Consideration is given to the financial position of affected producers in determining whether disaster assistance is needed.

Western Livestock Price Insurance

Purpose: The Western Livestock Price Insurance Program (WLPIP) provides risk management coverage to producers of fed cattle, feeder cattle, calves, and hogs in BC, Alberta, Saskatchewan, and Manitoba.

Criteria: The products offered under WLPIP target price perils including cash/futures prices, cash-future price basis, and the US/Canada currency exchange rate. In each case, coverage occurs in the form of minimum price options that producers purchase. If actual prices received fall below the minimum, enrolled producers are issued an indemnity for the difference between the minimum established in the option and the actual price received. Premium costs under WLPIP are paid by producers enrolled as with a typical insurance policy, with administration of the program provided by governments.

As a producer-funded and producer-driven program, WLPIP has seen strong producer uptake. The program started in Alberta with fed cattle pricing insurance in 2009, with feeder added in 2010, calf in 2011 and hog in 2012. In 2014, WLPIP was launched in the provinces of Alberta, British Columbia, Saskatchewan and Manitoba. Although with a relatively short history, WLPIP reports good uptake as provinces expect continual growth and adoption.[20] Below is a snapshot of the program uptake when it started and how it looks like today[21]:

- Forty-five (45) Fed policies were paid indemnity the first year, in 2009.
- To date, in 2019, well over 4,000 Fed policies have been sold in Alberta, covering 1.5 Million head and $2.5 Billion dollars in liability.
- In 2011, the first fiscal year, two (2) calf policies were sold, price protecting 108 calves.
- To date—across the west—the calf program has covered 2.5M head through 23,000 policies.
- In total, WLPIP has covered 6.2M head, $8.8B in liability with almost 39,000 policies written.

[19] Eligible sales exclude supply managed product sales, aquaculture, trees and tree products, peat moss, and sales of wild game held for hunting purposes.

[20] Agriculture and Agri-Food Canada (2018) Evaluation of AgriRisk Initiatives Program

[21] Agriculture Financial Services Corporation (2019)

Advance Payments Program
Purpose: The Advance Payments Program (APP) is a federal loan guarantee program which provides agricultural producers with easy access to low-interest cash advances. An APP advance can help producers to meet financial needs, such as farm input costs, immediate financial obligations, and product marketing costs. It can also allow decision to sell agricultural products based on market conditions rather than the need for cash flow. **Criteria:** Producer cash advance is calculated based on up to 50% of the anticipated value of the eligible agricultural products that is produced or in storage. **Notes:** Under the program, producers can access up to $1,000,000 per program year in advances based on the value of their agricultural product, with the Government of Canada paying the interest on the first $100,000 advanced to a producer. Advances are repaid as the producer sells their agricultural product, with up to 18 months to fully repay the advance for most commodities (up to 24 months for cattle and bison). Livestock that are currently eligible include: cattle, hogs, sheep, bison, rabbits, red deer, boar, goats, elk

BRM programs uptake

The use of BRM programming as an instrument to address a large-scale reportable disease presents some challenges, as such cases are not amenable to relatively quick recovery, and the path back to a normal situation could be long and uncertain (think of BSE). However, for individualized cases of short-term disease risks, BRM programs can provide useful cushioning and tide producers over to the recovery from the disease and a more normal income situation. Low participation rate and poor financial coverage of BRM programs will expose the industry to more risk and increases the potential demand for ad hoc support.

This section provides a summary of BRM programs uptake, including AgriStability, AgriInvest, and WLPIP. Due to limited public data available, AgriStability and AgriInvest uptake are only tracked between 2007 to 2014/2015.[22] As a framework for FPT government collaboration, AgriRecovery does not require producer uptake and is not included in this review.

AgriStability

Participation rate in AgriStability has consistently declined from 57% in the 2007 to 33% in 2014.[23] However, the percentage of market revenues covered has not declined as dramatically (from 75% in 2007 to 55% in 2014) as a result of high participation rates among large producers. The 2015 program year saw a slight improvement in both participation rate (34%) and market revenues covered (57%).[24]

As shown in Figure 9 below, participation is especially low in supply managed commodities (27%) and cattle (34%), and highest in hogs (75%), although a downward trend is observed for all species.

[22] Figure 9 and 10 are sourced from Agriculture and Agri-Food Canada and do not include the latest 2014/2015 data available

[23] Agriculture and Agri-Food Canada (2017) Evaluation of AgriStability, AgriInvest, AgriInsurance and the Wildlife Compensation Program

[24] Agriculture and Agri-Food Canada (2018) 2017–18 Departmental Results Report - Details on transfer payment programs of $5 million or more

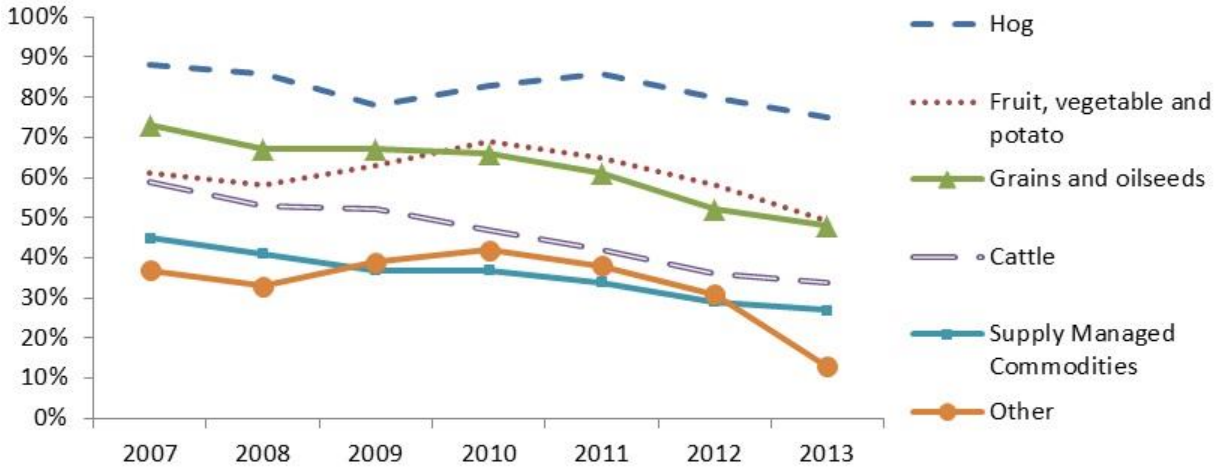


Figure 9. AgriStability producer participation rate by commodity group by year.
Source: Agriculture and Agri-Food Canada

According to the AAFC evaluation report, this trend can be explained by the program's complexity, lack of transparency or predictability, issues with the timeliness of payments, the strength of recent market conditions and commodity prices, and the GF2 program changes that reduced the number and value of the program payments. An article published by Country Guide cites that AgriStability seems unpredictable, and many producers fail to see its relevance to their farms.[25] Responding to producer concerns with the program, governments have introduced changes to AgriStability under the Canadian Agricultural Partnership that were effective in the 2018 Program Year.[26] These changes aimed to lower the administrative burden on producers enrolling in the program, and provided improved coverage levels.

Table 3. Producer's average ratings of BRM programs (on a scale of 1 to 5)

Element	AgriStability	AgriInvest	Total
Timeliness of Benefits	2.79	3.65	3.59
Responsiveness of Program	2.56	3.47	3.43
Predictability of Benefits	2.58	3.58	3.49
Clarity of Program	2.70	3.62	3.55
Program Average	2.65	3.58	3.51

Source: Ference & Company (2016). 2016 BRM Producer Survey Findings

[25] Country Guide (2018). Risk Warning
[26] Agriculture and Agri-Food Canada (2018) 2017–18 Departmental Results Report - Details on transfer payment programs of $5 million or more

AgriInvest

AgriInvest is praised by producers for its flexibility, timeliness, predictability of payments, and program clarity. Participation in the program (% of producers participating) has remained stable over the seven years tracked. In 2015, 80% of producers participated in AgriInvest, up from 75% in 2014.[27] Notably, since the program aims self-management of risks and does not stipulate that the funds withdrawn must be used to offset income losses, it is difficult to ensure how these funds are being used (e. g. manage financial risks, deal with small income losses or make investments to reduce on-farm risks).

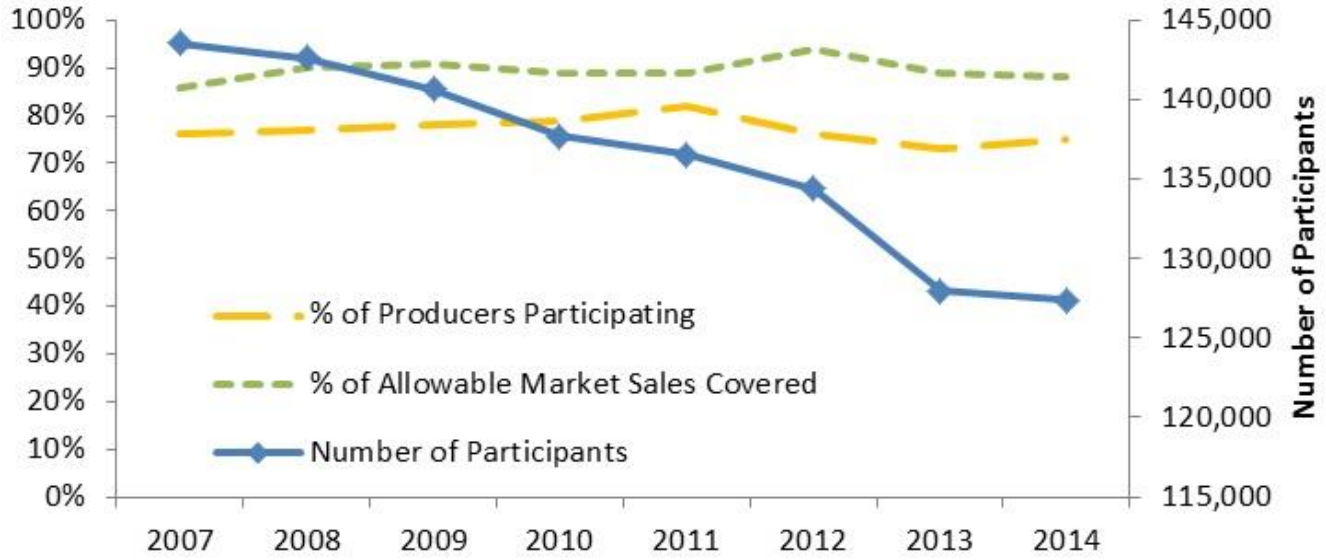


Figure 10. AgriInvest producer participation and coverage of market sales by year
Source: Agriculture and Agri-Food Canada

[27] Agriculture and Agri-Food Canada (2018) 2017–18 Departmental Results Report - Details on transfer payment programs of $5 million or more

Other Tools

Health of Animals Act and Regulations

Purpose: The Heath of Animals Act provides federal requirements and regulations regarding diseases and toxic substances to protect animals and animal-based foods, by preventing the importation, exportation and spread of pests and by controlling or eradicating pests in Canada. The purpose is not only to compensate for the asset loss of the producer, but also to encourage producers to report the emergence of animal diseases in a timely manner.

Criteria: Within the Act, the Minister has the power to order quarantine and/or destruction of animals, as well as the power to provide, under Section 51, for compensation for the value of livestock ordered destroyed or injured. Section 55 provides the authority to establish specific regulations setting out the conditions and levels of compensation. The regulations setting out the compensation for animals condemned under the Heath of Animals Act, and the costs of disposal is contained in the *Compensation for Destroyed Animals Regulations.*[28]

Notes: Compensation may be provided when animals are ordered destroyed as part of CFIA administered disease control activities. Under the Health of Animals Act, producers may be compensated for:

- animals ordered destroyed;
- other things ordered destroyed, such as contaminated feed or animal products;
- disposal costs including transportation of animals
- cleaning and disinfecting the equipment used for the disposal
- vaccination costs for animals ordered to be treated; and
- fair market value of things ordered destroyed

Compensation is not provided for other costs such as cleaning and disinfecting of barns and handling areas, loss of markets due to quarantine, etc. The amount of compensation is based on the animal's market value, up to a maximum amount as stipulated in the *Compensation for Destroyed Animals Regulations*. The maximum values are reviewed periodically ranging from annually to every four years. When evaluating the market value of an animal, two different methods are used:

1. Based on comparable sales and current prices, determine the fair market value of an animal in a disease-free market, between a willing buyer and a willing seller who are knowledgeable, informed, and prudent, and who are acting independently of each other.
   Species: cattle, hogs, horses, sheep, goats, elk and deer
2. Use an economic model to determine an animal's value based on its production/life cycle at the time of its evaluation. For example, since supply-managed poultry are not traded during the normal production cycle (other than pullets), it is difficult to determine a market value (e.g. what is the market value of a 26-week-old broiler breeder that is about to start laying eggs?).
   Species: poultry (i.e. chicken broiler, turkey broiler, chicken broiler breeder, egg layer, pullet and turkey breeder) and salmon

Other regulations regarding compensation can be made on an *ad hoc* basis; for example, regulations are in place for chicken ordered destroyed due to Avian Influenza in British Columbia.[29]

[28] SOR/2000-233 These regulations establish the levels of funding to cover the costs destruction and disposal of animals ordered destroyed, and set maximum payments.

[29] Compensation for Certain Birds Destroyed in British Columbia (Avian Influenza) Regulations (SOR/2004-150)

Risk Management Program (Ontario)

Purpose: Ontario provides stabilization under the Risk Management Program (RMP) that assists in managing economic risks in a range of farm enterprises, including cattle, hogs, sheep, goats and veal. The focus of stabilization is revenues from farm sales relative to a target price, established based on estimated production costs.

Criteria: A payment is issued when actual revenues in a given enterprise fall below the target price, with actual payments dependent on selected coverage levels and subject to overall program funding caps at a 40 percent rate, which is the share of provincial funding in BRM programming. Producers pay a premium to participate in RMP programs.

Assurance Stabilization Revenue Agricole (Quebec)

Purpose: Assurance Stabilization Revenue Agricole (ASRA) provides stabilization for a range of farm products in Quebec, including beef calves, veal calves, feeder and slaughter cattle, feeder pigs, slaughter hogs, and lamb. The focus of stabilization is revenues from farm sales relative to a target price-established based on estimated production costs.

Criteria: Under ASRA programs, farm models are used to reflect production costs, on an updated basis.[30] The estimated costs are compared with actual revenues–if revenues fall below estimated costs, enrolled producers are issued payments. Payments under ASRA programs are coordinated with AgriStability which limits double compensation. Enrolment in AgriStability is a precondition for ASRA participation. Producers pay one-third of the premium cost of ASRA programs, with the balance covered by La Financière agricole du Québec.

Federal-Provincial-Territorial Disaster Support

Purpose: The two levels of government have put in place and updated the agreement on the provincial and federal responsibilities for disaster events.

Criteria: In general, the province is responsible for the initial costs of mitigating the effects of the disaster; as the overall costs of support rise beyond those covered by the province, the federal government bears an increasing share of the costs. The rule is that costs will not be covered if insurance is in place or was available for the losses whether or not the household or business actually carried insurance.

Poultry Insurance Exchange (Ontario, Alberta, Saskatchewan)

Purpose: The Poultry Insurance Exchange (PIE) provides insurance and risk management services to members of the poultry industry.

Criteria:

- For Ontario Broiler Hatching Egg and Chick Commission (OBHECC), Alberta Hatching Egg Producers (AHEP), Saskatchewan Broiler Hatching Egg Producers (SBHEP): Business Interruption Loss due to Salmonella Enteritidis (S.e.) and Salmonella Typhimurium (S.T. Dt.-104), Mycoplasma Synoviae (MS), Mycoplasma Gallisepticum (MG) Bacteria, and highly pathogenic avian influenza and low pathogenic H5 or H7 strains of avian influenza in Broiler Breeder Birds or Chicks
- For Egg Farmers of Ontario: Business Interruption Loss due to Salmonella Enteritidis (S.e.) Bacteria, and highly pathogenic avian influenza and low pathogenic H5 or H7 strains of avian influenza in breeder pullets, breeder layers, commercial pullets and commercial egg layers.
- For Chicken Farmers of Ontario: Business Interruption Loss due to highly pathogenic avian influenza and low pathogenic H5 or H7 strains of avian influenza

[30] These costs are calculated by economic-engineering models of each farm enterprise.

Bluetongue Insurance for Sheep - Discontinued
Purpose: Bluetongue Insurance provided Canadian sheep producers with affordable coverage for mortality, business interruption and consequential losses due to Bluetongue. **Criteria**: Bluetongue Insurance covered producers for: mortality; consequential loss (drugs and treatment materials; veterinary fees; diagnostic fees; humane euthanasia) and; business interruption (loss of productive capability; additional feeding and management costs). Under the insurance policy, the value of the animal was predetermined. This value was reviewed annually to ensure that it kept pace with the market value.

Risk Management Observations

When examining the current range of support tools available and how they affect the ability of Canadian producers to respond to animal health emergencies, three main observations emerge:

1. The mix of programs can cover many aspects of animal health-related risks
The business risk management programs outlined above provide for a mix of instruments that can apply in an animal health emergency. It includes protection for aspects of revenues (AgriInsurance and WLPIP), operating income (AgriStability, ASRA, RMP), incentives for savings and self-risk management (AgriInvest), compensation for product ordered quarantined or destroyed (Health of Animals Act), and funding for the out of pocket or ongoing costs to recover/rebuild capacity from an animal health disaster impacting a region or group of producers collectively (AgriRecovery and FPT Disaster Support).

2. Funding tools are designed for limited/temporary timeframes
In general, the existing programming set seems predicated on the idea that disasters impacting agriculture will be limited or temporary, with BRM payments allowing producers to recover and carry on until a more normal situation resumes. For example, AgriStability and AgriInvest payments per farm are capped at $3 million and $10,000 respectively. With the exception of the regulations under the Health of Animals Act, which targets individual cases where animals are ordered destroyed rather than industry-level impacts, BRM programming is not designed to address the sudden and potentially prolonged impacts of a livestock disease such as export market access. Without *ad hoc* funding under AgriRecovery, the impacts of a trade-limiting or prolonged livestock disease event would fall back to AgriStability and (perhaps) operating programs such as ASRA in Quebec or RMP in Ontario. With disease and border closure events impacting pricing in Canada, it is unclear how effective the WLPIP programming could be, as the basis element of coverage could be highly volatile in such a situation.

3. Reliance on ad hoc stabilization tools provide both flexibility as well as risk
Ad hoc stabilization in response to disease outbreak events has recent precedents in Canada. The succession of programs launched in response to the BSE crisis are examples, as are programs launched to address circovirus in hogs and avian influenza in BC. These programs were highly targeted and responsive by nature, highlighting the benefits of having a flexible ad hoc structure. On the flip-side however, ad hoc programs for livestock disease emergencies and response are difficult for governments to plan and budget for; they are also not certain (or "bankable") for producers and tend to lack an incentive structure in program design.

Financial Investment Assessment

Methodology and limitations

As part of the gap analysis, the Synthesis team conducted an inventory and assessment of financial investment in PPR&R. We reached out to national and provincial commodity groups, national and provincial governments, industry organizations and key stakeholders. We asked the following question:

For your organization, please outline current (2018-2019) livestock disease prevention, preparedness, response and recovery (PPRR) initiatives or programs and the resources dedicated to them.

- ***Scope** and **objectives** of existing initiatives*
- ***Funding** level devoted to the initiative*
- ***Personnel** (Full Time Equivalents) committed to the initiative*
- ***Infrastructure** committed (both solely committed to the initiative and the share of other existing infrastructure)*

As of December 3, 2019, we received 128 investments from 47 organizations. Out of the 128 investments, 22 were national and 106 were provincial.

Below is a summary of completeness of information by group.

Since major gaps exist in information received, this assessment indicates a portion of the Canadian investment rather than a complete summary.

Table 4. Completeness of data by group

Groups	Received from	Completeness
National agencies/organizations	CCIA, CFIA, CAHC, AAFC (CAP funding delivered to commodity groups), NFAHWC	Good
Provincial governments	ON, QC, BC, AB, NB, MB, SK, YK, NWT	Good
Beef	National, AB, SK, BC, MB, NB, NS	Good
Dairy	National, AB	Low
Chicken and eggs	QC, BC, AB, MB, ON	Good
Turkey	(Did not contact at provincial level)	Low
Sheep	National, ON, AB QC, SK	Good
Swine	Numbers consolidated nationally, QC	Good
Bison	National	Good

Due to the complexity and varying level of detail we received, data for this assessment are subject to limitations below:

- Since major gaps exist in the financial information received, this inventory assessment should be seen as a snapshot of the Canadian landscape rather than a complete summary.
- This analysis included animal disease specific programs only (not animal welfare, food safety).
- Did not include overarching food safety programs if we were unable to separate out the animal disease aspect (eg: VBP+, TFC Flock Care).
- Did not include past projects (current, ongoing only).
- Data quality may vary based on how the organization calculated their investments, however there is no practical way to audit or compare consistency of the calculation
- Producer and processor implementation cost of biosecurity and traceability programs are of significance but out of the scope of our project.
- Although funding, personnel and infrastructure investment information was requested, less than half of the responses included personnel information, and twelve responses identified infrastructure or equipment. Since personnel and infrastructure do not have enough data points, this analysis focuses on funding.
- Due to CFIA's data reporting structure it is not possible to divide its funds into PPRR categories. Since CFIA is the largest investment item across the board, lumping this investment into any category would skew the overall analysis. Therefore, this assessment separates the investments into CFIA and non-CFIA and summarizes them differently.
- CAP funding is reported from both AAFC and the industry groups who received funds. Presumably a lot of industry investments are CAP funded but most industry groups did not report funding source so it's not possible to separate industry funds and CAP funds. Hence this assessment reports industry and AAFC investment together.

Overall Observations

- **Total financial investments (including salaries[31]) of $277M were submitted** across Canada and across species, including $141M from CFIA, $72M from provincial governments, and $64M from industry and AAFC (including CAP funding).
- As shown in the graph below, CFIA represents 51% of all investment, provincial governments represent 26%, industry and AAFC represents another 23%.

Salaries of CFIA, AAFC, MB government were provided. All other salaries are estimated at $83,890/FTE using the CFIA average.

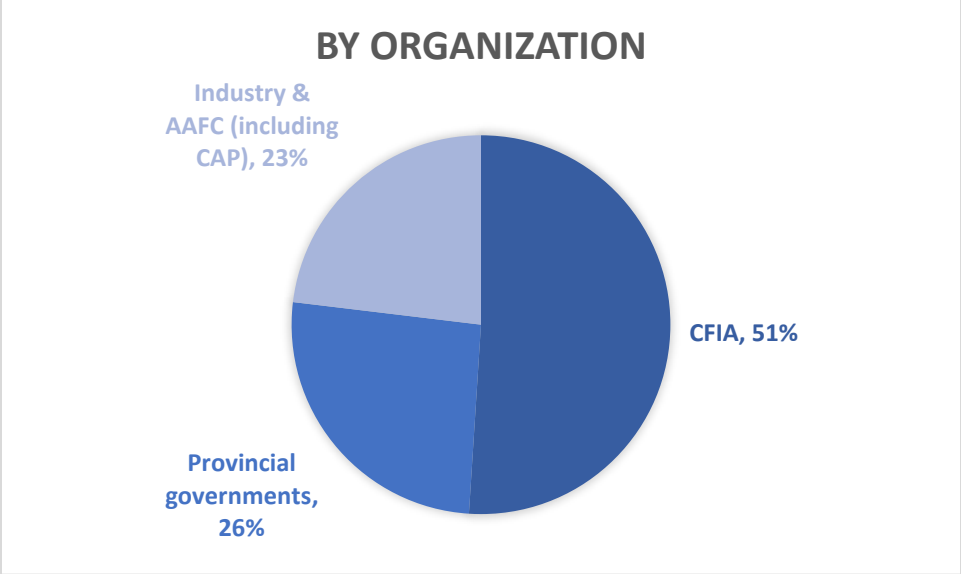


Figure 11. Financial investment by organization, salary included

[31] Salaries of CFIA, AAFC, MB government were provided. All other salaries are estimated at $83,890/FTE using the CFIA average.

- **Excluding salaries, the investment total is $133M across Canada and across species**, including $47M from CFIA and $86M from other organizations. As shown in the graph below, provincial governments represent 42% of all investment, CFIA represents 35%, industry and AAFC CAP funding represent another 23%, as shown below.

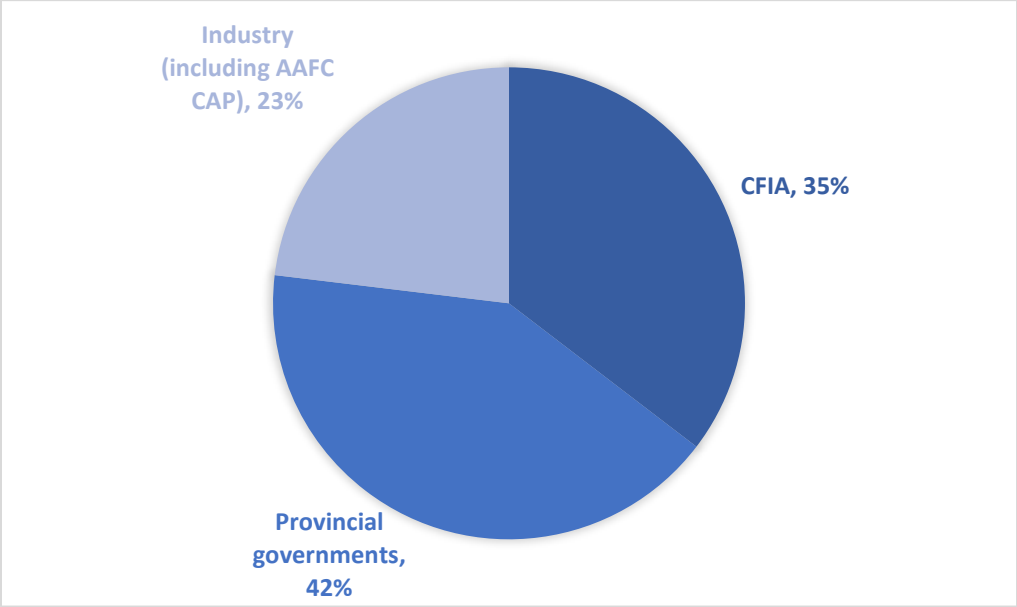


Figure 12. Financial investment by organization, salary not included

- **The main focus of personnel dedicated to animal disease management is on preparedness and prevention.** Of the 1738 FTEs reported, 68% cover more than one aspect of PPRR, 28% focus on preparedness and 4% on prevention.
- **Generally underinvested for animal disease management**. Financial investment in animal disease management can be seen as insurance premium paid against an outbreak event. Although the optimal "premium" level is yet unknown, $277M is only slightly higher than 1% of Canadian animal farm cash receipts.
- **Strong focus on preparedness and prevention**. Preparedness accounts for over half of total investment. Prevention takes up 34% and response takes up 9%. To some extent, this reflects the success of Canada's current system in preventing animal disease events as only a relatively small amount is spent on "putting out fires".
- **No investment information was submitted for recovery activities**. This could be partly explained by the ad hoc nature of recovery activities and the fact that Canada was lucky to not experience any major animal disease event in the time period (2018-2019).
- **There is room for improved coordination between national and provincial**. Most national commodity groups invest in animal disease programs and initiatives, with the exception of poultry groups who referred us to the provincial level. There are many small-scale programs and initiatives at the provincial level, however this fragmented approach is not efficient for disease events that incur national liability.

- **There is some multispecies co-ordination** at the national level, such as CCIA which covers cattle, sheep and bison. This provides a base for collaboration for animal diseases involving more than one species.
- **There are varying levels of investment across Canada**. Regionally, animal disease investment is the strongest in Central Canada. Western Canada is underinvested considering that it represents almost half of Canadian animal farm cash receipts.

Producer investment

Apart from financial investments made by government and industry, the investment by producers to implement traceability and biosecurity programs are essential to PPRR of animal diseases. Although it is out of the scope of this gap analysis to comprehensively examine the full investment by producers, the following data demonstrates a portion of producer investment into traceability and related activities.

Table 5. Examples of Producer Implementation Costs

Species	Region	Tag Sales/Inspection Fees
Sheep	National (tags)	$1,210,000
Swine	National (PigTrace funded by tags)	$380,000
Cattle	National, BC, SK, AB (CCIA, provincial inspection fees)	$14,809,288
Equine	BC, SK, AB (provincial inspection fees)	$250,979
Total		**$16,650,267**

While the data above show a snapshot of the investment by producers into animal identification and inspection fees, the full investment by producers is much higher, as this is only an example. Expected implementation of full traceability requirements (including movement reporting and recording) under the federal Health of Animals Act will increase the overall investment by producers and other industry players into traceability.

Producer and processor investment in implementing biosecurity and traceability are significant components of Canada's PPR&R.

Another area of significant investment at the producer level is implementation of biosecurity. Investment in biosecurity is most significant by poultry and pork producers and includes time requirements, equipment such as gates, signage, and extra clothing and footwear. Although perhaps not an on-going cost, another area of significant investment to implement biosecurity would include building or facility renovations to create controlled access zones or to enhance biosecurity at the farm-level (for example by adding a shower).

CFIA investment

The CFIA is responsible for safe food, healthy plants and animals. The Agency protects Canadians by safeguarding Canada's food system and the plant and animal resources on which Canadians depend, and also by supporting the Canadian economy through the trade of Canadian goods.

Naturally, the CFIA accounts for a significant share of Canadian investment in animal disease Prevention, Preparedness, Response & Recovery (PPRR). This assessment, however, must separate the investment into CFIA ($47M) and non-CFIA ($86M) funds and not PPRR categories because the CFIA reports financial investments and results in animal health to Parliament and Canadians under four broad institutional functions or programs:

- **Setting rules** – developing programs, policies, controls and scientific methods to help ensure safe food and healthy animal and plants.
- **Compliance promotion** –providing tools and clear information to help industry and Canadians understand the rules, why they are important and what is needed to comply
- **Monitoring and enforcement** – verifying industry compliance with the rules through surveillance activities, inspection activities, and laboratory testing.
- **Granting permissions** – granting permissions in a timely manner so applicants can meet the specific rules required for food commodities, plants, animals and their products. This includes import and export certificates. While export permissions support market access and are not in the scope of this project, import permissions are related to prevention.

Additionally, CFIA also plays a key role internationally by supporting international standard setting market access regulatory cooperation and science collaboration.

Below is CFIA investment by institutional functions. Although the data cannot be clearly categorized as PPRR, it is clear that CFIA investments focus mainly on prevention, preparedness and response. Besides these, CFIA also administers compensation, which falls under the recovery category.

Table 6. CFIA FTE investment by institutional functions

CFIA institutional functions	Investment (excluding salary and wages)	Salary and wages	FTE
Setting rules for animal health	$ 8,743,575	$ 24,257,262	263
Animal health compliance promotion	$ 1,312,916	$ 5,858,218	68
Monitoring and enforcement for animal health	$ 31,314,955	$ 42,551,739	524
Permissions for animal products	$ 5,540,998	$ 21,373,815	266
Grand total	$ **46,912,444**	$ **94,041,034**	**1121**

AAFC, provincial governments and industry investment

AAFC, provincial governments and industry (Non-CFIA) investment totals $136M across Canada and across species. This includes $50M of salaries, however, since only a small portion of respondents provided FTE and salary information, the analysis includes non-salary investment only. The following charts show analysis of investment by PPRR, region and species in an effort to identify potential gaps and opportunities for synergy.

Since personnel and infrastructure did not receive enough data points, our analysis of AAFC, provincial governments and industry investment only includes funding.

the

By prevention, preparedness, response and recovery

Across Canada, over 89% of animal disease funds are invested in prevention and preparedness, and 8% is invested in response activities.

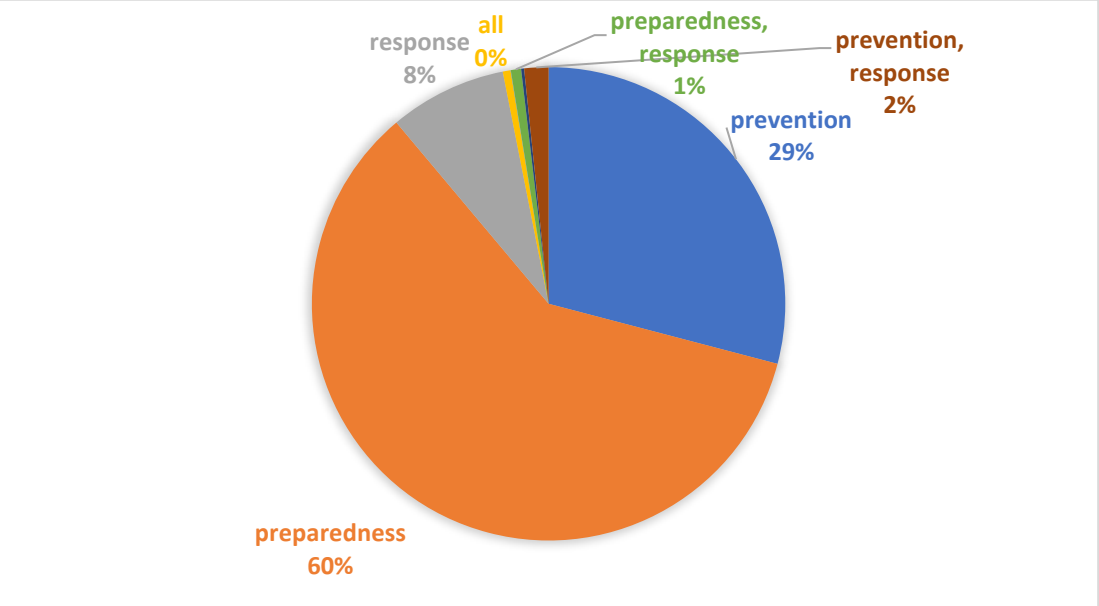


Figure 13. AAFC, provincial governments and industry investment by PPRR, salary not included

A further breakdown by industry (including AAFC CAP funding) and provincial government shows that both have a strong focus on preparedness. Industry invests more on response while provincial governments invest more on prevention.

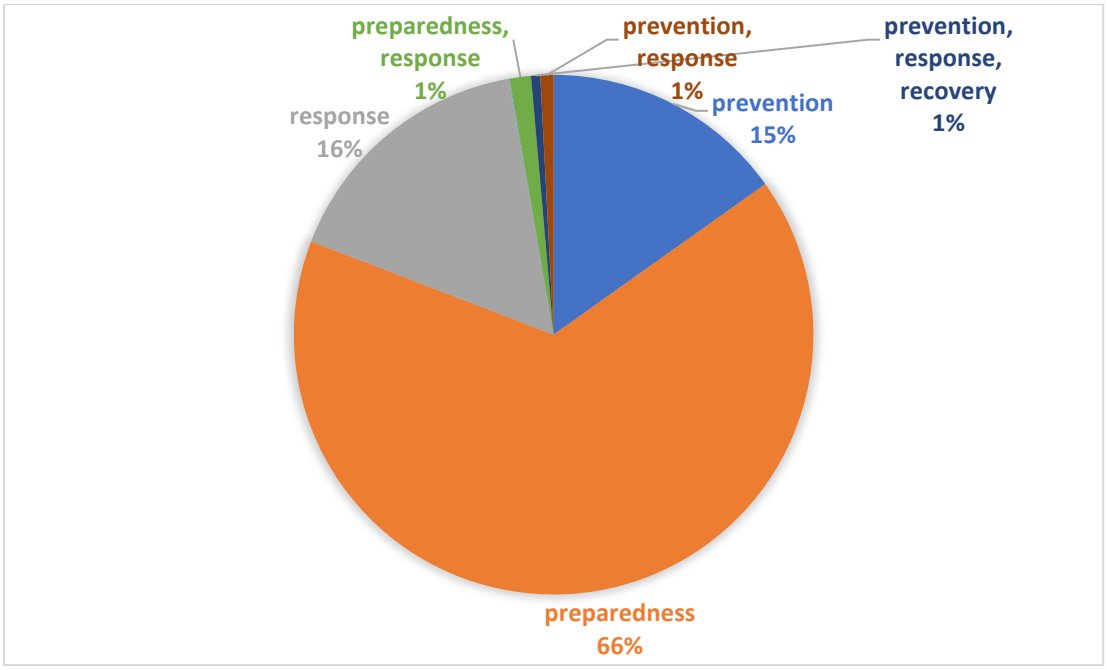


Figure 14. Industry and AAFC CAP investment by PPRR (provincial government excluded), salary not included

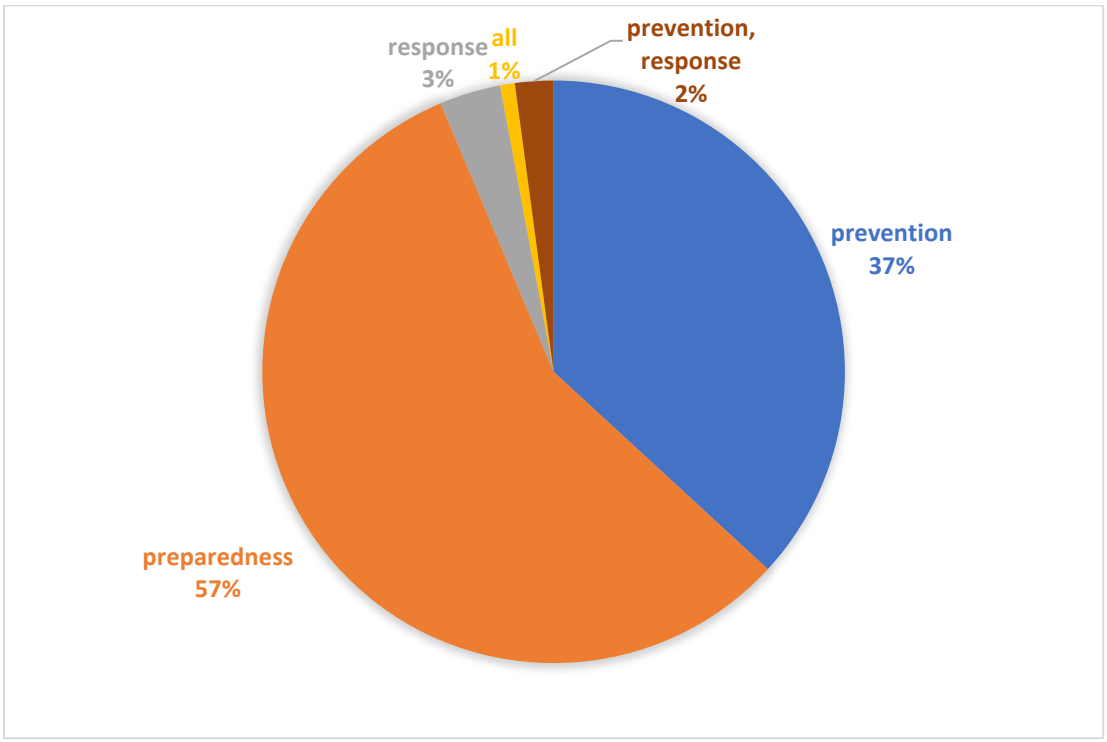


Figure 15. Provincial government investment by PPRR, salary not included

By region

Across Canada, we analyzed the regional difference between West (BC, AB, SK, MB), Central (ON, QC) and Atlantic (NB, NS, PEI, NL). Investments at the national level account for 14% of non-CFIA investments. Regionally, Central takes the largest share, followed by West.

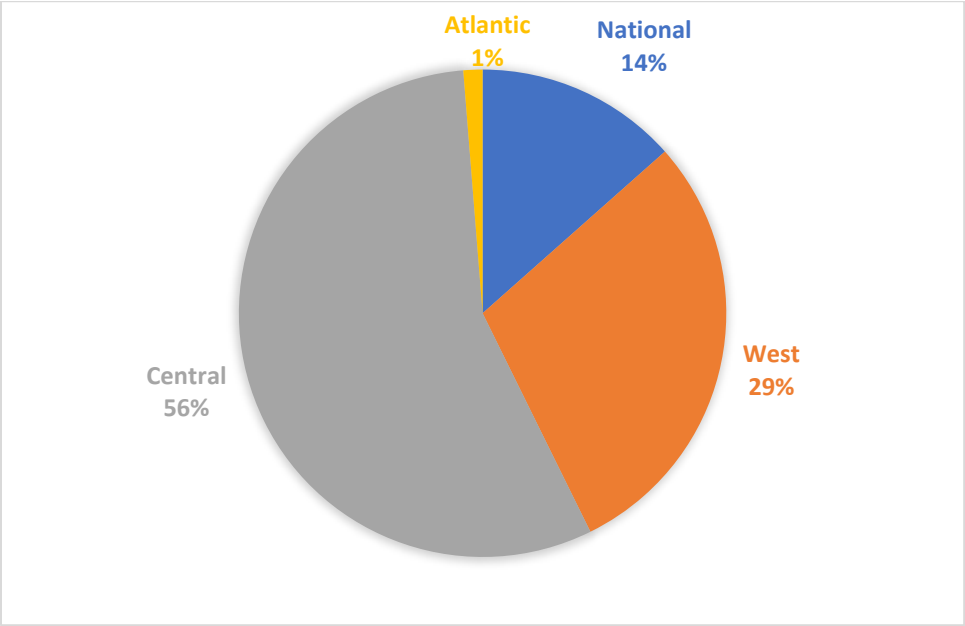


Figure 16. AAFC, provincial governments and industry investment by region, salary not included

By species

Since a lot of government programs do not focus on a specific species, 69% of investments are categorized under multispecies. Cattle led the individual species investment at 18%, followed by swine, poultry, sheep and dairy.

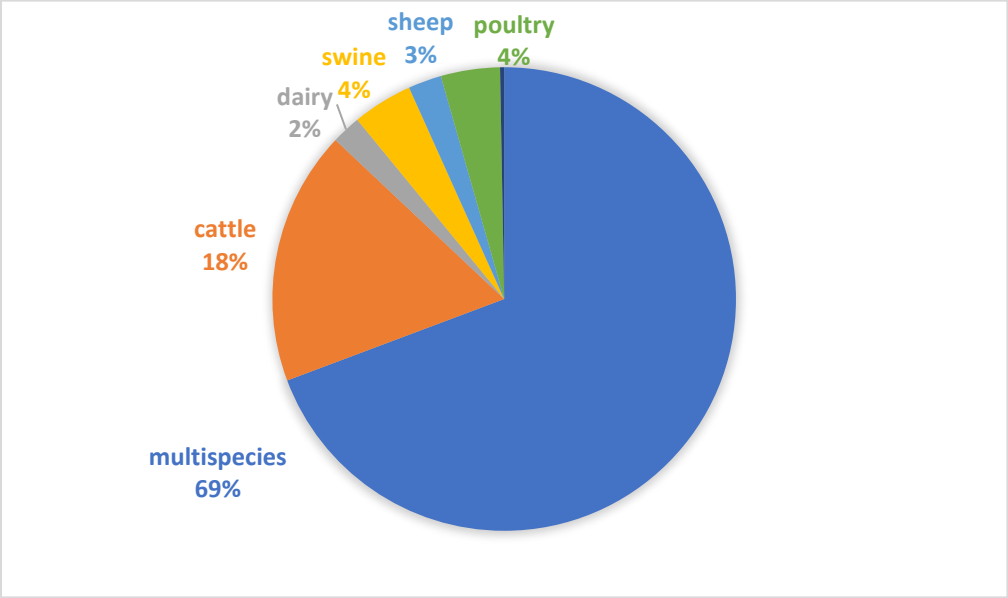


Figure 17. AAFC, provincial governments and industry investment by species, salary not included

AAFC, provincial governments and industry FTE investment

Of the **617 FTE** reported, the majority (78%) work on activities that can be categorized as preparedness. Prevention is the second largest category (11%), and some job functions cover more than one category of PPRR.

The table below shows FTE percentages categorized as prevention, preparedness, response and/or recovery. This information is expected to be conservative as some organizations did not include policy teams and other program areas that would also come into play for response planning and implementation of recovery activities, for example.

Table 7. AAFC, provincial governments and industry investment FTE investment by PPRR

PPRR categories	FTE	Percentage
Prevention	66	11%
Preparedness	478	78%
Response	14	2%
Recovery	2	0%
Prevention, Preparedness, Response, Recovery	41	7%
Prevention, Preparedness, Response	6	1%
Prevention, Preparedness	1	0%
Preparedness, Response	9	1%
Prevention, Response	2	0%
Grand total	**617**	**100%**

Appendix

Appendix 1: Livestock Sector Overview

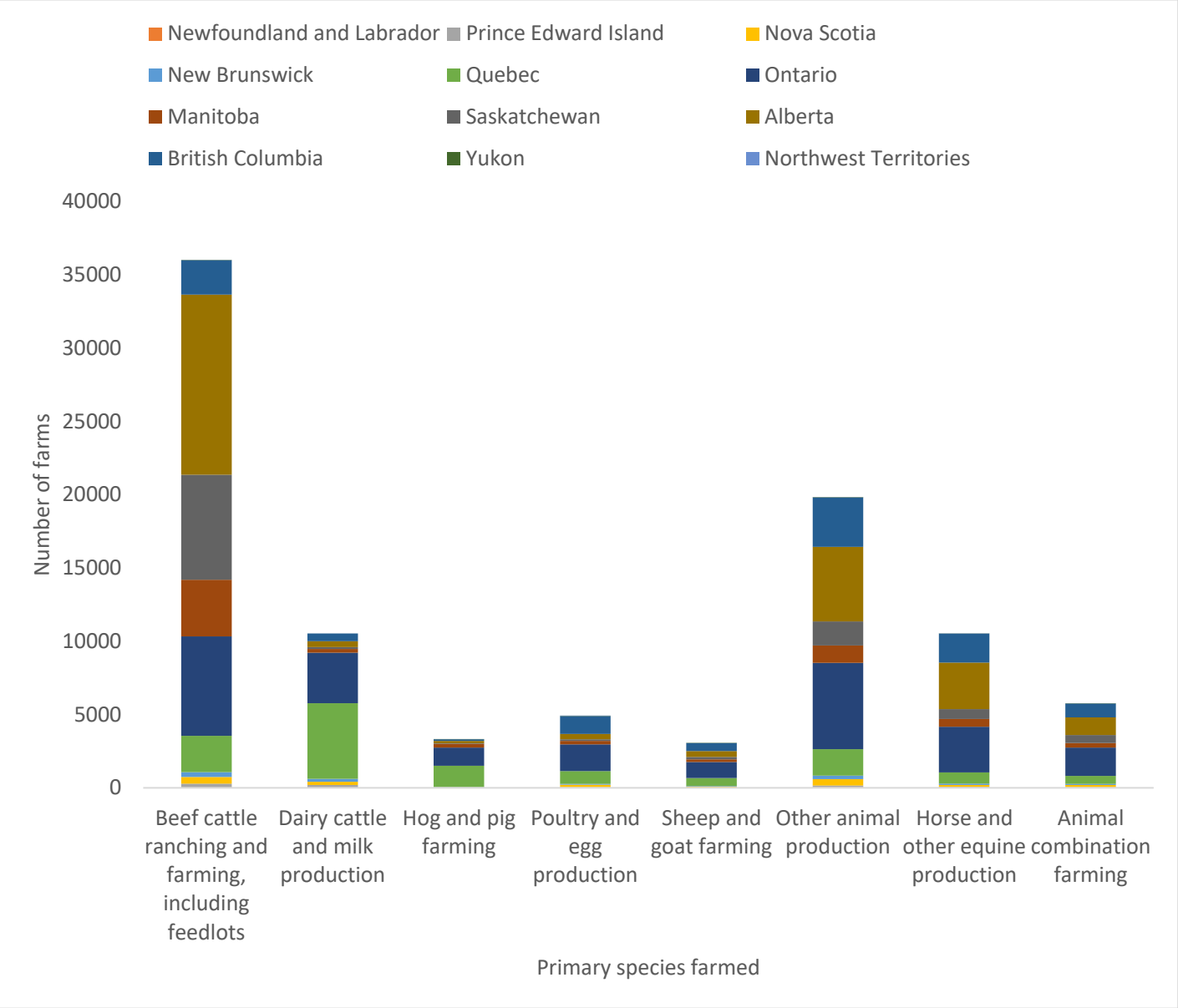


Figure 11. The number of livestock farms in Canada in 2016, by province, by primary species farmed.
Source: Statistics Canada. Table 32-10-0403-01 Farms classified by farm type

Notes:
Other animal production: one of the following: bees, horses and other equines, rabbits and other fur-bearing animals, and so forth, and producing products, such as honey and other bee products.
Animal combination farming: A combination of animals with no one animal or family of animals accounting for one-half of the establishment's agricultural production (i.e., value of animals for market)

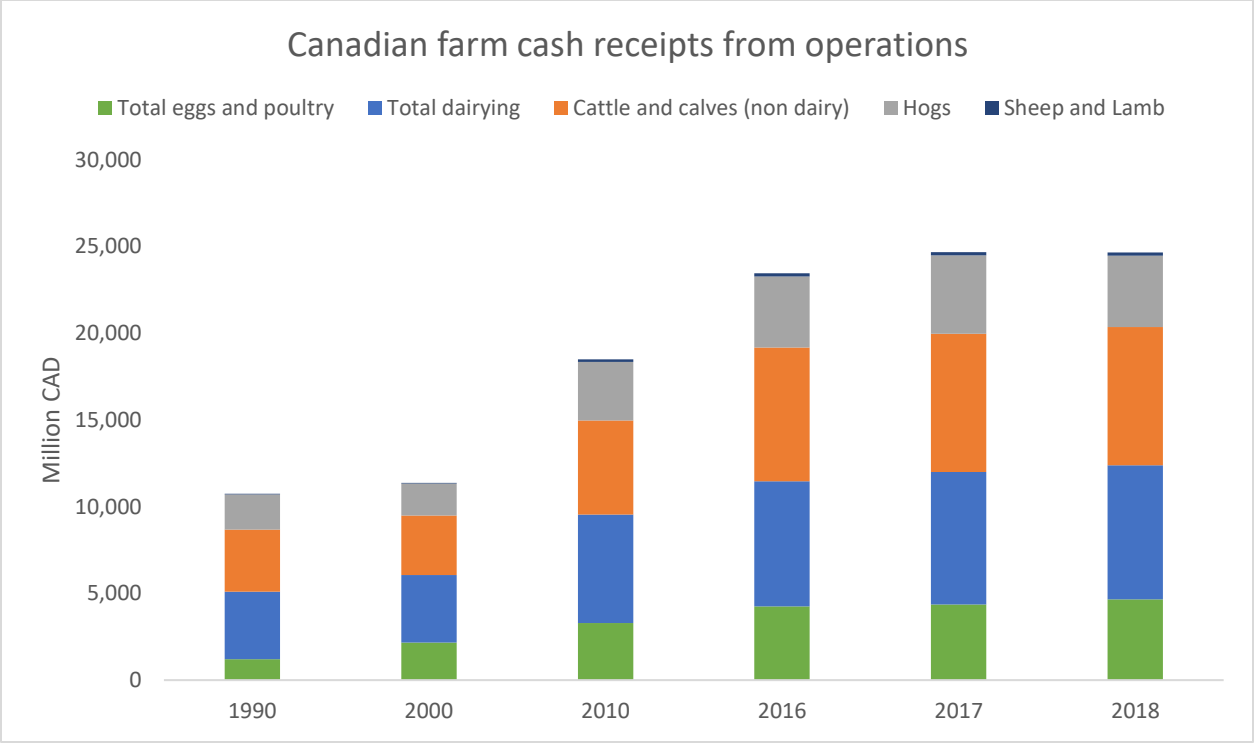


Figure 12. Canadian farm cash receipts from operations.
Source: Statistics Canada

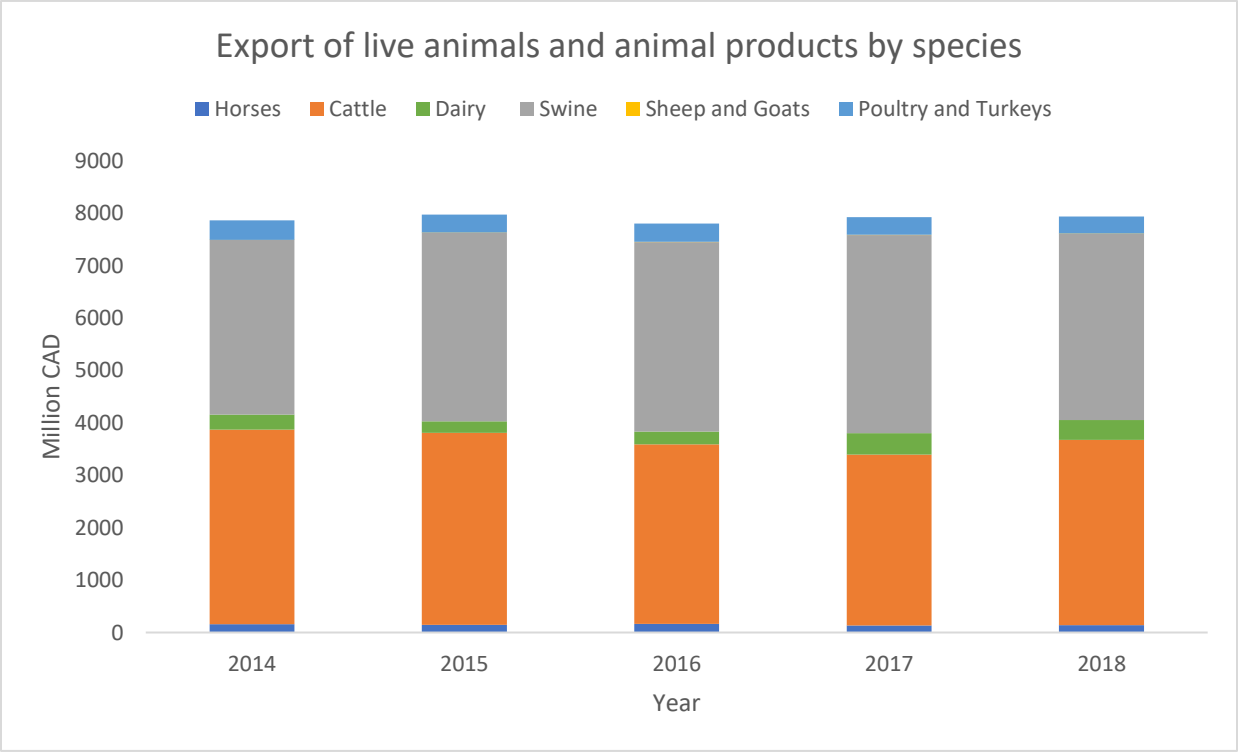


Figure 13. Export of live animals and animal products by species.
Source: Source: Agriculture and Agri-food Canada, Trade Data Online (accessed: July 09, 2019)

Appendix 2: Economic Impact Analysis - Background

Economic Elements of Livestock Disease Outbreaks

The various economic dimensions of livestock disease outbreaks have been addressed in a range of previous studies. Pritchett et al (2006) focused on the development of alternative research typologies to study livestock diseases. Barratt et al (2018) developed a framework within which the economic welfare effects of livestock diseases can be evaluated, applied to the study of Johne's Disease in dairy cattle in the EU. McLeod et al (2016) developed guidelines for the economic study of animal diseases for the UN-FAO; they developed a framework that relates the geographic and sectoral scale of animal heath disease events to the costs of treatment, economic viability of treatment, and incentives for participation in disease controls.

The effects or nature of a livestock disease can range considerably. If the disease is zoonotic either by direct animal contact or through food products, it immediately becomes a human public health concern. While diseases that are non-zoonotic do not carry this same concern, the mental health impacts on producers and service providers involved in disease response can not be ignored. Secondly, a disease that is reportable to the World Animal Health Organization (OIE) can carry implications in terms of market access responses by trading partners, and restricted market access. Non-reportable production-limiting diseases generally do not carry this implication. Diseases can generate high levels of animal mortality, or conversely be manifest primarily as animal morbidity. These effects can differ sharply. Diseases that result in high mortality generate a loss of sales and input costs incurred to date; conversely, diseases that primarily result in morbidity have increased costs due to lower production (e.g. lower milk production, less efficient growth).

The effects of livestock diseases can also be transmitted through supply chains - for example, losses to the feed industry as animal / herd losses leads to reduced feed demand. A critical aspect is the effect of the disease on consumer demand, as a softening demand due to consumer fear or negative reaction will reduce intermediate product demand and/or price throughout the supply chain. In other words, a livestock disease event can have a direct financial impact on the livestock industry (lost sales and profits), as well as an indirect financial impact on industries along the supply chain, such as transporters, feed suppliers, exporters, tourism, and slaughterhouses.

The geographic scope of the disease outbreak should also be considered. Animal diseases may be endemics that are readily contained in a local area, epidemics that spread over a broader area, or pandemics with spread at an international scale. This can be influenced by the mode of spread (e.g. airborne versus direct animal contact versus environmental contamination) and environmental stability of the disease organism. These all entail very different control and mitigation approaches. The scope of animals impacted is also a variable–some diseases affect multiple species including wildlife; others may impact primarily young animals with little impact on adult/breeding animals or vice versa.

The approach taken to control measures is another important aspect in understanding economic effects. In some diseases, the approach taken is to eradicate the disease through culling and destruction. This entails a particular combination of sales/income loss and out of pocket costs to carry out the cull with a goal to eliminate the pathogen. In other cases, when the goal is to reduce the level of disease rather than eliminate the pathogen from a population, the actions could be an acute treatment such as a vaccine or drug, disease testing and quarantine. The income loss and cost of control is apt to be very different versus an eradication approach, and in

either case the efficacy of the approach will vary, with the prospect of re-infection or resistance to the treatment. This, in turn, relates to the rapidity of response to the identification of the disease, and the motivation/incentives of individuals to participate in the control/mitigation initiative.

Overview of Economic Studies of Livestock Diseases in Canada

Foot and Mouth Disease (FMD)
• In its 2002-03 report on planning, CFIA highlighted protection of the animal resource base as the foundation of animal health and public health. In its discussion, CFIA noted that "the potential cost of an FMD outbreak in Canada is estimated at $30 billion, taking into account costs such as slaughter, disposal, decontamination of farms, compensation for destroyed animals, loss of local and international trade and loss of tourism. • Serecon (2002) considered the economics of an outbreak of foot and mouth disease (FMD)in Canada. The study considered the prospective impact of FMD on cattle and hogs under three scenarios relating to scale of outbreak, and with variations considering the length of market interruption and whether zoning could be employed to salvage market access. The analysis was conducted using consultations to develop scenarios, with the resulting data simulated through Statistics Canada's National Input Output Model. The results showed a range of net economic impact across scenarios ranging from $8.3 billion up to about $46 billion.
Bovine Spongiform Encephalopathy (BSE)
• In 2003, just following the first Canadian case of BSE, Serecon conducted an economic study of economic effects of BSE for the Canadian Animal Health Coalition. The study considered the economic effects assuming a trade ban lasting one month, or four months. The results were simulated using a model of lost cattle sales in the various stages of cattle production (direct impacts) as well as beef sales (secondary impacts) as well as tertiary segments such as livestock genetics. The results showed a loss of $541 million for a one-month export ban, and $2.55 billion for a four-month ban. In both cases, the majority of losses were due to lost export sales. Ultimately, elements of an export ban remained in place on BSE from late May 2003 to the fall of 2007. To this day small ruminants are still affected by the ban. • In a review of policies and effect relating to BSE in Canada, Carlberg and Brewin (2005) cite an estimate that, by 2005, the lost direct cattle sales due to BSE was $5.5 billion. • Leroy et al (2006) considered the economic impact of BSE over the period May, 2003 to May 2005, and considered market losses (exports and reduced domestic prices- live animals, meat, and by-products) and additional costs borne to manage the disease. They estimated the loss due to BSE to be just under $4.1 billion, with the loss dominated by reduced exports of cattle, beef, and by-products. • Samarajeewa *et al* (2006) considered the economic impact of BSE in Canada from the perspective of lost employment and both direct and downstream effects in Alberta, Saskatchewan, Ontario, and Quebec. Using the Statistics Canada economic impact model, they found that for every $10 million in export sales lost due to BSE, a loss in GDP of about $8.7 million in each province occurs, along with a loss of labour income averaging about $3.7 million per province and a loss of about 145 jobs in each province.

Avian Influenza (AI)
• An economic study of the effect of AI in BC was conducted by Serecon (2004). The study covered the broiler chicken, specialty chicken, layer and turkey segments in the lower mainland of BC, and considered the period of depopulation, dormancy, and production recovery from 2004-2006. The study estimated one-time costs, lost sales (direct effects) and multiplier effects on downstream segments. The results showed direct effects in terms of lost sales of $222.6 million across segments; when this was extended to include costs of recovery and secondary effects on downstream segments, the loss increased to $391 million.
Porcine circovirus associated disease (PCVAD)
• A study by EBiz undertaken by the Canadian Swine Health Board (2010) evaluated the economic effects of PCVAD on the Canadian swine industry. The study considered the direct impacts of circovirus on swine producers, the indirect effects on supplying and purchasing industries, and the induced effects on changes in consumer purchasing. To estimate direct effects, a set of matrices were developed that evaluated, across provinces, the proportion of farms effected by PCVAD, the proportion of mortalities due to PCVAD, and the rate of morbidity due to PCVAD, in each year 2005-09. The results showed total direct losses of $562 million over the five years, composed largely of $150 million in lost farm revenue, and increased veterinary/recovery costs of $268 million. The estimated costs on ongoing vaccination (cost to cure) were estimated at $542 million, with a total economic impact of PCVAD estimated at $1.4 billion.
Porcine Reproductive Respiratory Syndrome (PRRS)
• The economic effects of PRRS were studied by Mussell et al (2011). The study was completed as a component of a Canadian PRRS strategy. Scenarios of PRRS effects in terms of mortality and morbidity at different stages of production were developed, and simulated in a stochastic economic model that captured the effects of variance in pig growth (morbidity) due to PRRS. The results showed that under alternative PRRS scenarios, the farrowing rate decreases, mortality rates increase, the number of hogs marketed decreases, the feeding period increases, and the net returns per hog decrease. The aggregate impact of this effect, combined across provinces, was estimated at $130 million/year.

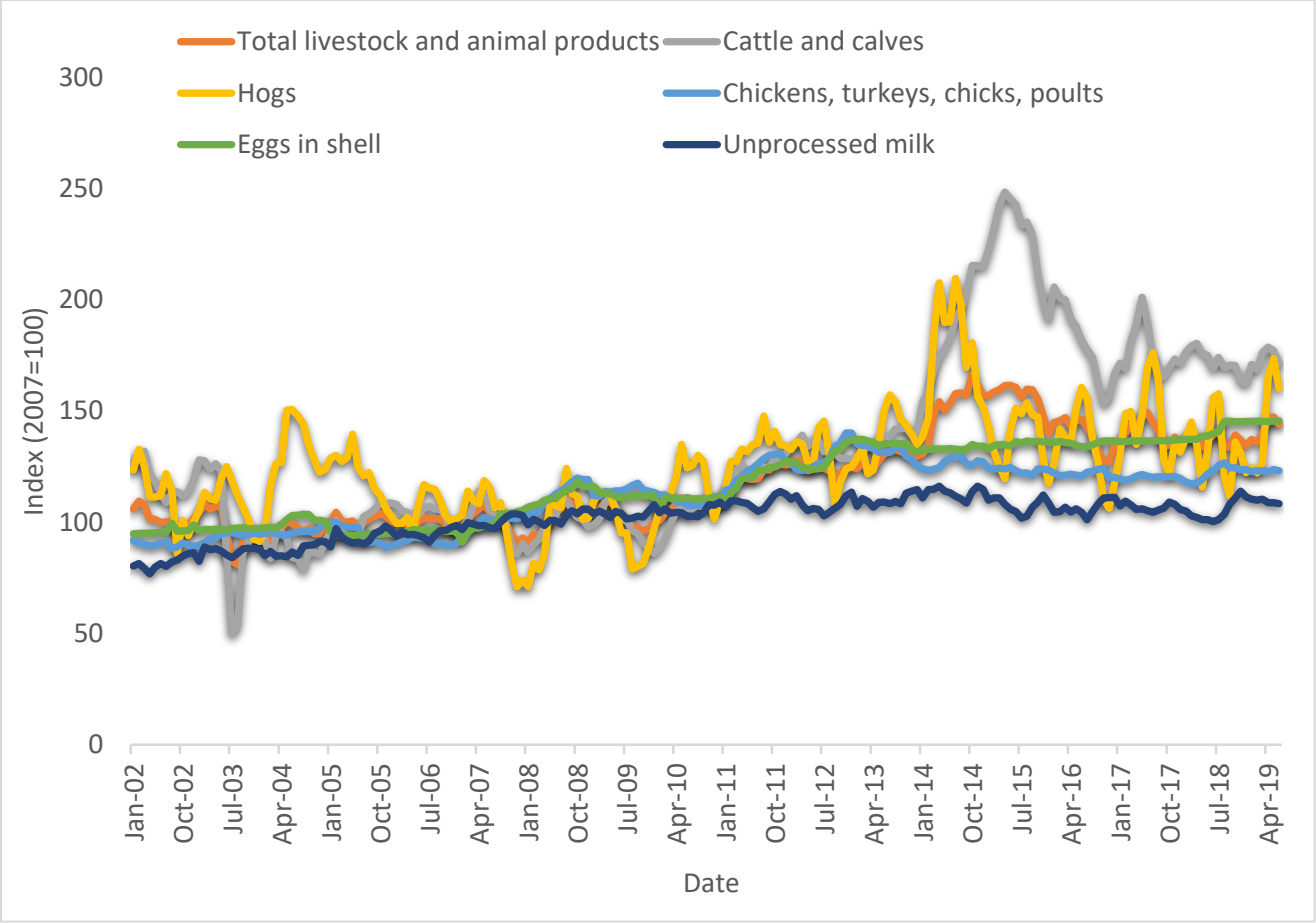


Figure 14. Farm Products Price Index- Livestock (2002 to 2018).
Source: Statistics Canada. Table 32-10-0098-01 Farm product price index (FPPI), monthly

Appendix 3: Key Informants

AAFC - Frederic Seppey, Assistant Deputy Minister, MISB
AAFC - Rosser Lloyd, Director General, Programs Branch
AAFC - Patti Negrave, Deputy Director, MISB
AAFC - David Trus, Animal Registration Officer, MISB
AAFC - Nilos Korodimas and Jamie Miller, Market and Industry Services Branch
AAFC - Lisa Wellman-Patterson, Luc Marchand
AHC Working Group - Henry Ceelen (CVMA), Corlena Patterson (CSF), Cheryl Schroeder (DFC), Robin Horel (CPEPC), Rob McNabb (CCA), David Moss (CCA), Lorne Jordan (CFIA), Lisa Wellman-Patterson (AAFC)
Canada East Laboratory Network - Elizabeth Dobbin, Andrea Bourque, Carmencita Yason, Carolyn Sanford, Nicole Wanamaker, Erin Leonard, Laura Rogers, Jim Glotz, Catherine Graham, Estela Cornaglia, Maria Perrone, Olivia Labrecque, Joan Bourque
Canada West Laboratory Network - Anatoily Trokhymchuk, Glen Duzier, Jagdish Patel, Jane Pritchard, Jennifer Davies, Mark Hicks, Maria Spinato, Neil Pople, Wayne Lees, Yanyun Huang
CAHC AHEM team - Mikki Shatosky, Matt Taylor, Todd Bergen-Henengouwen
CAHSS - Andrea Osborn (CFIA/ACIA), Betty Althouse, Cheryl James (CFIA/ACIA), Claudia Gagné-Fortin, Bédard, François (AAFC/AAC), Grant Maxie, Harry Gardiner (CFIA/ACIA), Jane Pritchard, Luc Bergeron, Rachel Ouckama, Erin Leonard
Canadian Council of Veterinary Officers - Ashwani Tiwani (CFIA), Carolyn Sanford (PEI), Cathy Furness (ON), Sebasatien Cloutier (QC), Debbie Barr (CFIA), Helene Trepanier (QC), Jane Pritchard (BC), Keith Lehman (AB), Wendy Wilkins (SK), Dale Douma (MB), Joanne Riendeau (CFIA), Lee Ann Forsythe (SK), Erin Leonard (NS), Heather Fenton (NWT), Mary Vanderkop (Yukon), Luc Bergeron (Quebec), Laura Rogers (NL)
CFIA - Rick James-Davies, Senior Director
CFIA – Ian Alexander, Director of Animal Health Services Division
CFIA - Colleen Barnes, Associate Vice President, CFIA
CFIA - Debbie Barr, Director, Animal Health, Welfare & Biosecurity Division, Tom Smylie, and Sandra Stephens
CFIA – Jaspinder Komal, Chief Veterinary Officer
Canadian Cattlemen's Association - David Moss & Rob McNabb
Canadian Cattle Identification Agency - Anne Brunet-Burgess
Canadian Meat Council - Kim O'Neil and Jorge Correa
Canadian Veterinary Medical Association - Jost am Rhyn
Canadian Veterinary Medical Association - Jim Fairles & Shane Renwick
Canadian Faculties of Agriculture & Veterinary Medicine - Greg Keefe
Canadian Pork Council - John Ross
Canadian Wildlife Health Co-operative - Craig Stephen
Wayne Lees
Allan Preston
EQCMA (poultry) and EQSP (swine) (Quebec) - Martin Pelletier
Manitoba Agriculture - Glen Duizer
MAPAQ - Hélène Trepanier
Maple Leaf Foods - Rory McAlpine
Meat and Poultry Ontario - Franco Naccarato & Daphne Nuys-Hall
National Cattle Feeders Assoc. - Janice Tranberg & Casey Vanderploeg

NFAHW Council - Lorne Jordan (CFIA), Cheryl Schroeder (DFC), Colleen McElwain (CAHI), Keith Lehman, Rob McNabb (CCA), Marco Volpo (CFC), Jane Pritchard, Hélène Trépanier (MAPAQ), Megan Bergman (Executive Director)
OMAFRA - Tim Pasma & Cathy Furness
National Poultry Organizations - Robin Horel (CPEPC), Drew Black (CHEP), Steve Leech (CFC), Malenka Georgiou (TFC), Elyse Germain (EFC)
University of Calgary - Eugene Janzen

Appendix 4: Survey Results

Overview

The Animal Health Canada Gap Analysis Survey was designed to better understand perceptions of Canada's various animal health systems and programs, and to identify key areas for improvement as perceived by various stakeholders. The survey was distributed to a cross-section of organizations representing government, producers, veterinary services, universities, processors and lab services.

The survey was launched on October 6, 2019 and closed on October 23, 2019. The total number of respondents (English and French) was 201.

Methodology

The survey was distributed via SurveyMonkey to a list of key correspondents from various stages and sectors of the industry, and these correspondents then circulated the survey widely throughout their respective networks. The 15 survey questions were designed to span the breadth of Canadian animal health improvement areas and initiatives, and also to probe specific gaps perceived by different individuals and groups.
Survey respondents were prompted for qualitative responses to all questions except 1, 2, and 6. These responses were summarized into categories within each question by our team. These qualitative responses would often fall into multiple summary categories; the number of responses in the summary categories therefore may not match the overall number of survey responses for each question.

Question 1: What type of organization do you primarily represent?

The majority of respondents were producer organizations, followed closely by government representatives (Figure 15).

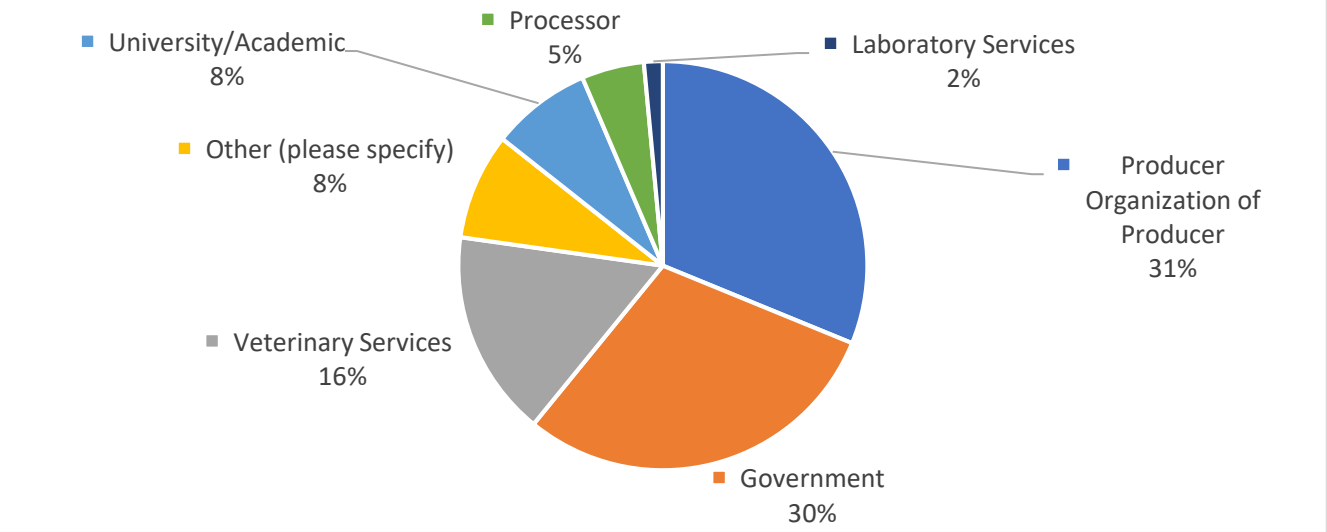


Figure 15. The types of organizations represented, as a percentage of all respondents. There were 201 responses to this question.

Some examples of responses in the "other" category included representatives from equine sports, manufacturers of animal health products, livestock marketing, the pharmaceutical industry, and the Canadian Disaster Animal Response Team.

Question 2: In answering these survey questions, will you be answering from an overall animal health perspective (across all species) or will you be answering from a specific species/sector perspective? Please check all that apply.

The majority of respondents were answering from the overall animal health perspective (Figure 16). Of those who specified their industry, the poultry, beef, and sheep industry had the most respondents, followed by the dairy, equine, swine, and goat industry with similar percentages of respondents.

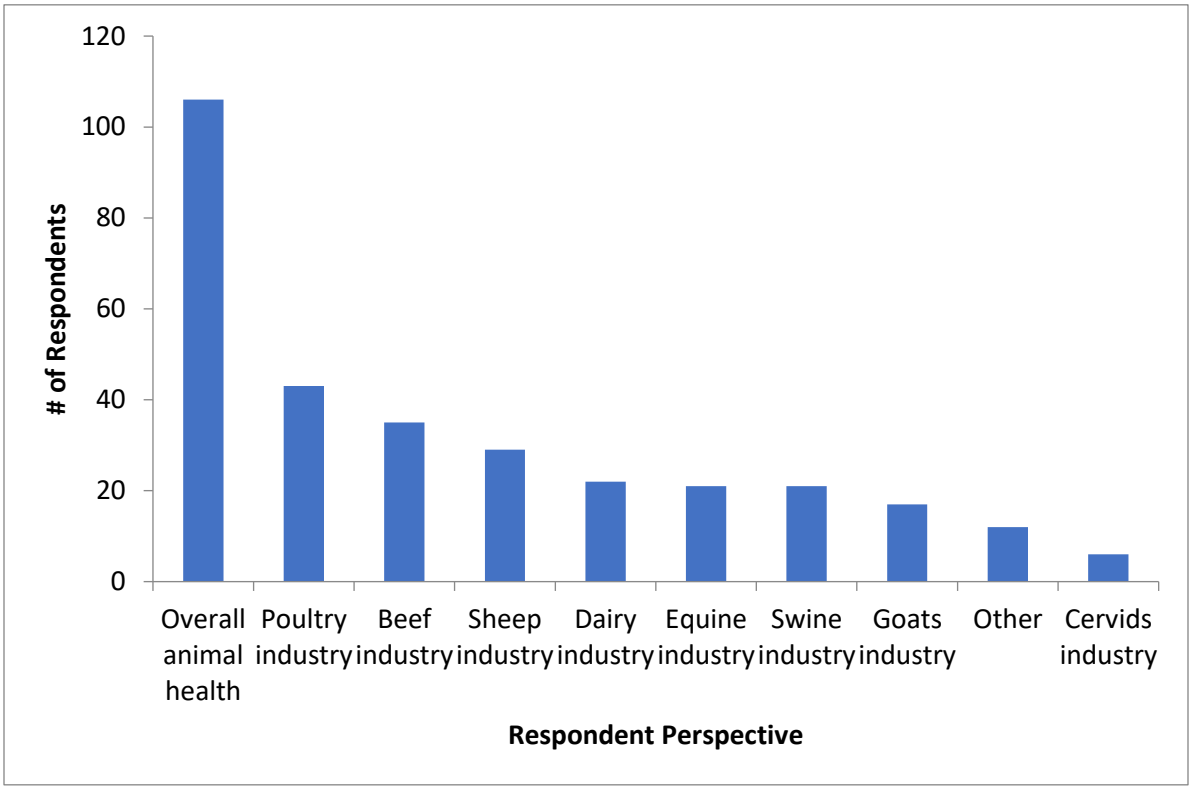


Figure 16. The perspective of survey respondents, as a percentage of total responses to the question. There were 199 responses to this question.

Some examples of perspectives listed in the "other" category include bison, camelids, small animals/pets, and wildlife.

Question 3: From your perspective, what are the top three most successful initiatives in the past few years to prepare for or manage animal health risks? What made them successful?

This question allowed participants to enter 3 open-ended answers. The most common answer was "Information sharing and collaboration", followed by "Surveillance networks/diagnostics" (Figure 17).

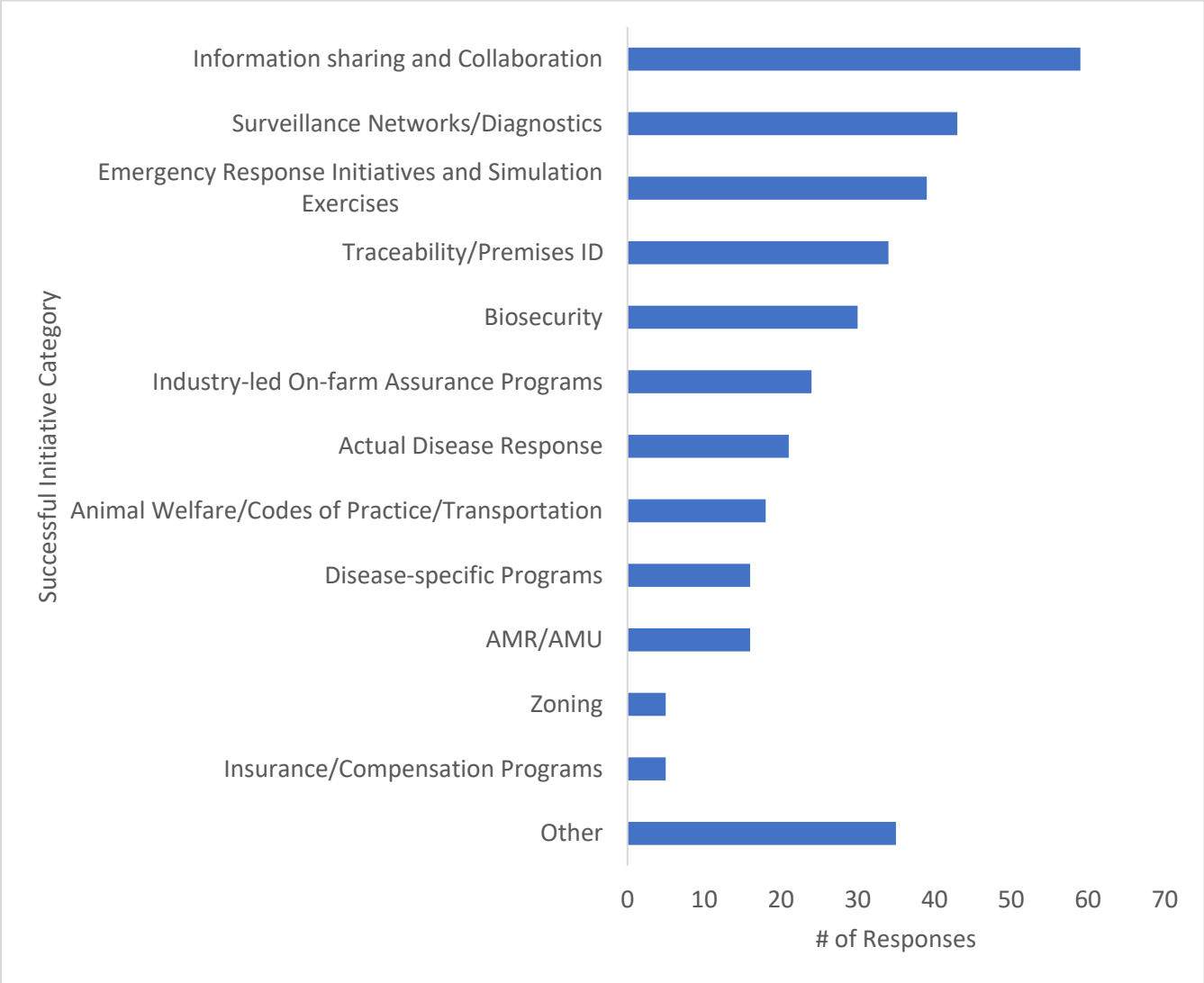


Figure 17. Categories of successful Canadian animal health initiatives. This chart was created from 310 initiatives from 143 respondents.

Category breakdown

Information Sharing & Collaboration: 59

Examples:

- CFIA African Swine Fever Forum
- National Farmed Animal health and Welfare Council
- Government/industry formal 'lessons learned' sessions after an AI event
- Multi-party joint response initiatives – engaging multiple levels of government and industry groups
- Pacific Northwest Economic Region Exercise
- Livestock Market Interruption Strategy, National Plant and Animal Health Strategy

Surveillance Networks/Diagnostics: 43

Examples:

- OAHN, RAIZO, CSHIN, Saskatchewan Stock Growers' Association, Johne's Disease Surveillance Program

Emergency Response Initiatives and Simulation Exercises: 39

Examples:

- Feather Board Command Center, CAHC AHEM projects, Alberta Feedlot Emergency Preparedness Plan, Truck Wash Certification

Traceability/Premises ID: 34

Examples:

- PigTrace, AgriTraceabilité Québec, Canadian Sheep Identification Program

Biosecurity: 30

Examples:

- CFIA National Biosecurity Standards, proAction biosecurity module
- Canadian Swine Health Board On-Farm Biosecurity Initiative, Nova Scotia Department of Agriculture Biosecurity projects, Manitoba uses a colour-coding plan that lists biosecurity alertness by colour

Industry-led On-farm Assurance Programs: 24

Examples:

- Egg Farmers of Canada Start Clean Stay Clean, Canadian Pork Council Canadian Quality Assurance (CQA) Program, DFC proAction , Canadian Hatching Egg Quality program, Turkey Farmers of Canada OFFS

Actual Disease Response: 21

Examples:

- TB responses, MB Pork's work with MB CVO after 2017 PED outbreak, AI response in B.C.

Animal Welfare/Codes of Practice/Transportation: 18

Examples:

- Updating of the NFACC Codes of Practice
- Amendments to Transportation of Animals regulations under the Health of Animals Act

AMR/AMU: 16

Examples:

- CIPARS, Dec 2018 requirement for a Vet Client Patient Relationship

Disease specific programs: 16
Examples:

- CFIA Hazard Specific Plans , Se prevention program (layers), Ontario Sheep Farmers Maedi Visna Flock Status Program, Canadian Sheep Federation Scrapie program

Zoning: 5
Example:

- West Hawk Lake Zoning Initiative

Insurance/Compensation programs: 5
Examples:

- RIMAQ, Growing Forward funding for development of response plans by CAHC for small ruminants
- Development and updating of compensation model for poultry producers

Other: 35
Examples:

- Federal inspection of slaughter houses
- Bison Field Guide for Producers
- Strong import controls

Question 4: What are some examples of initiatives that have been attempted and failed? Please comment on why they failed from your perspective.

This was a two-part open-ended question. Some participants only answered one part of the question and the numbers below reflect that. If respondents gave an initiative area but did not name a specific initiative, their answer was still categorized accordingly and included. In all figures below, the initiative categories have been ranked by the total number of votes that were given in that area. Figure 18 shows the sum of all unique responses for each category, while Figure 19 stratifies category responses by the perspective of the respondent. As respondents could pick multiple perspectives that they represented, the category totals between Figure 18 and Figure 19 are not equal.

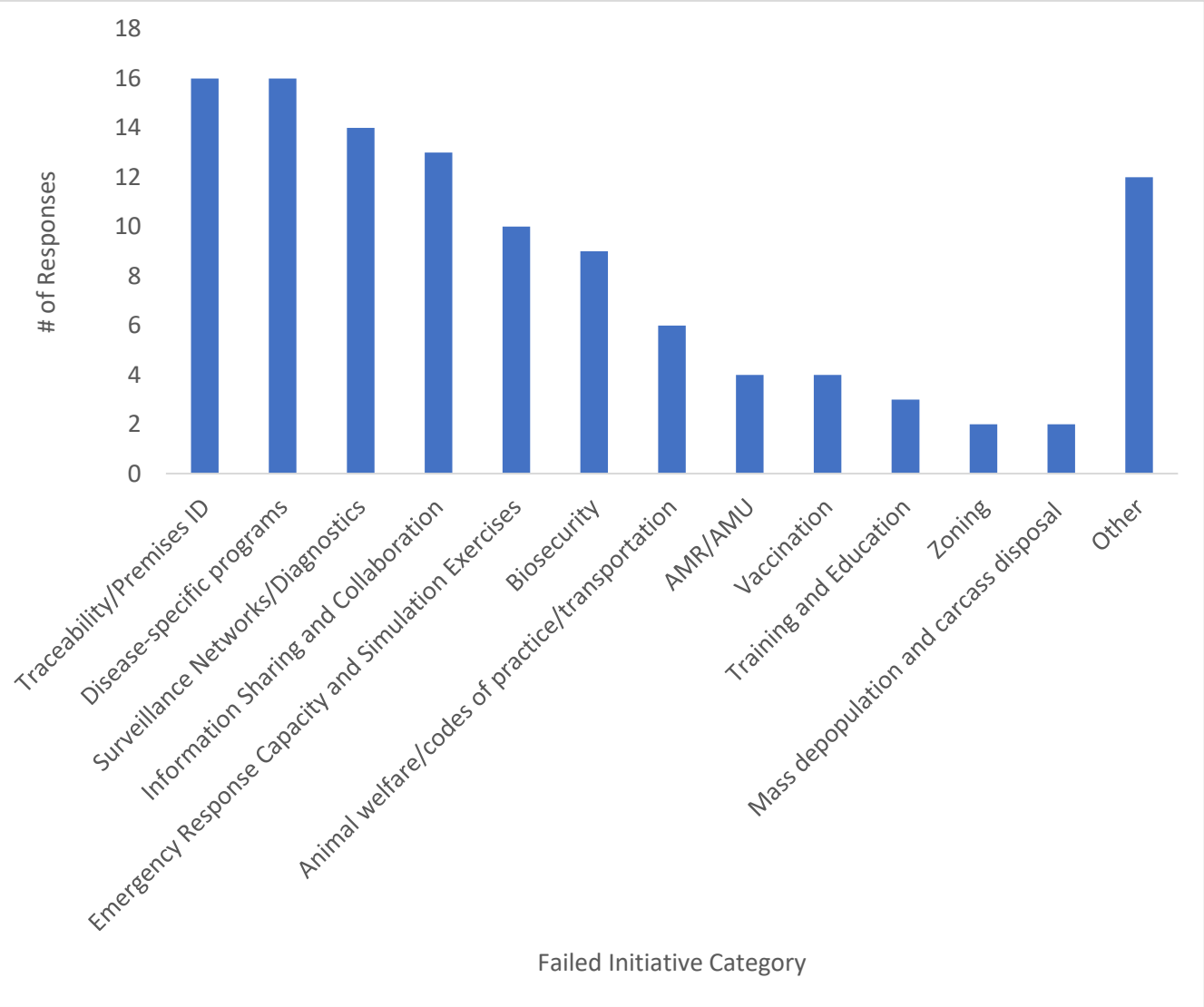


Figure 18. Categories of failed initiatives stratified by respondent type. This figure was generated from responses from 94 respondents, of which 36 were government, 41 were producer organizations and processors, and 17 were veterinary and laboratory services. Some respondents provided multiple examples of failed initiatives. The categories are ranked in descending order based on the total number of responses in each category.

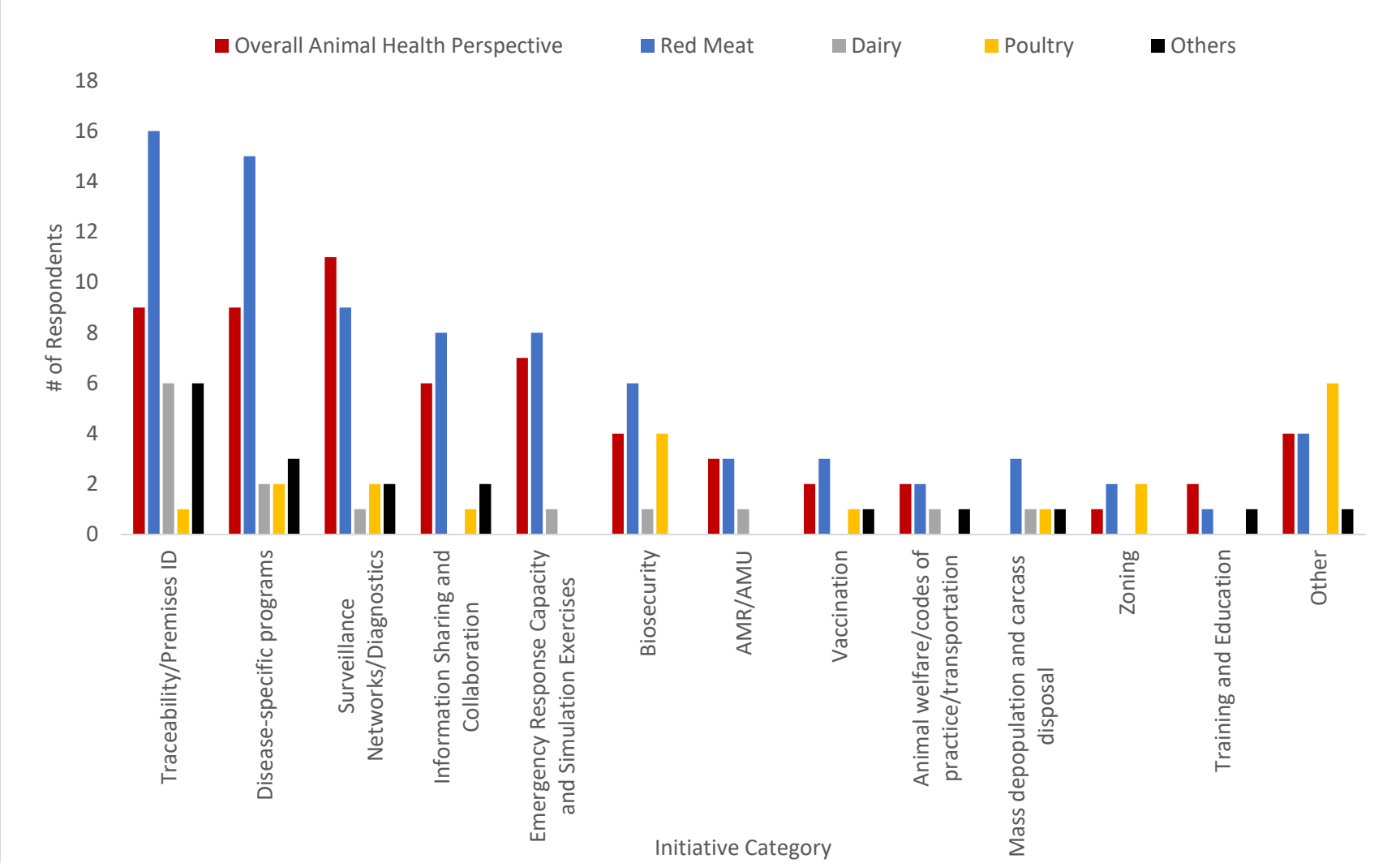


Figure 19. Categories of failed initiatives stratified by the perspective each respondent represented. This figure was generated from 185 responses from 131 respondents. Each respondent was given the choice to select all applicable perspectives that they represented, and their responses were counted for each perspective that they represented. Of the total responses, 60 were from respondents representing an overall animal health perspective, 75 from a red meat perspective (beef, cervids, goats, sheep, swine), 14 from a dairy perspective, 19 from a poultry perspective, and 17 from an other perspective. Some respondents provided multiple examples of failed initiatives. The categories are ranked in descending order based on the total number of responses in each category. Note that in this figure, respondents were given the choice to enter multiple perspectives, and each entered perspective was counted as a separate response.

Category breakdown

The majority of respondent comments from each category are listed below as they appeared in the survey, with some removed to avoid repetition. Note that this category breakdown corresponds to Figure 18.

Traceability/Premises ID: 16

Survey comments:

- Federal traceability initiatives…failing due to perception of lack of value from producers.
- BSE showed us how inefficient our current traceability programs are to enable trace in and outs.
- Implementation of traceability has taken far too long.
- Combining the traceability database.
- Equine Identification, traceability…Current efforts seem to be addressing the Equine sport community which may include less than 20% of the Canadian equine and/or owner population.
- Agritraçabilité Québec tracks every movement of livestock as the national program does not...
- Livestock traceability. Although work continues to ratify full traceability regulations in disease-sharing livestock species, delays mean that for the most part, we still haven't an effective traceability system. The key failures are competitive interests, unwillingness to compromise in the best interest of an effective methodology, inadequate federal investment and antiquated technologies.
- Pigtrace when they allowed the use of stenciled sprayed paint as an approved marker going to slaughter. It is not permanent and makes the whole program weak.
- Traceability - expense to the producer but no follow through in industry in tracking movements
- Traceability is not complete - needs to record all steps, not just farm of origin
- Traceability sucks. We're still scratching our heads after the TB outbreak out west.
- Traceability, thus far. Need a generation to change perspectives.

Disease-specific Programs: 16

Survey comments:

- CWD initiatives have not kept the disease from spreading. While the epidemiology of CWD is not well understood, transmission is also proven difficult to prevent.
- CWD situation in western Canada has somewhat gotten out of hand. Although both CFIA and provinces have tried to halt or figure out the total means of transmission there just seems that there needs to be more scientific research and financial done with this disease.
- EIA control in western provinces
- Foot baths at all international airports after BSE. Zero collaboration with industry and completely ineffective.
- I think BSE testing continues to ignore incentives and how people respond to them. This is a classic greater good situation where personal good is being ignored.
- PGM paratuberculosis control. Failed because government interest is no longer there.
- Prevention of PED from entering Manitoba - Not aggressive enough in prevention methods.
- Prevention of the introduction of S. Dublin in the Quebec livestock population. Lack of awareness at the industry level and lack of effective diagnostic tests for this disease.
- Programs for endemic, production limiting diseases such as Johne's and Leucosis have failed because of high costs, limited industry uptake and regional differences
- Scrapies program. While it's still operating, I feel it has failed because the uptake of the program is so small. Producers are frustrated because of the time it takes to process information and complain that it is poorly managed and that is why they leave the program.

- There is no solid plan to deal with African Swine Fever. Lots of discussion and working groups but the depopulation and disposal of the swine in an event continues to be a huge gap.
- TSEs that are not bovine (scrapie and chronic wasting). Scrapie has had insufficient input into surveillance to meet OIE requirements, unlike BSE. The voluntary scrapie certification programme lacked an outcome of value for the sheep and goat industries, i.e. access for breeding stock to USA markets.
- Canadian Johne's Disease Initiative - initially quite successful, but lack of funding and support has reduced it to provincial piecemeal initiatives

Surveillance Networks/Diagnostics: 14

Survey comments:

- Arguably, CAHSS has also failed. Lack of resources/funding mean that CAHSS potential has not been achieved (e.g. collection, analysis and reporting out of laboratory data for early disease detection).
- CEZD (from a domestic perspective): while CEZD is good at compiling information from primarily international sources, it has failed at early warning for domestic disease, which is arguably the most important goal. This may be due to several factors: lack of information, lack of early communication from stakeholders, lack of proper domestic network structure etc.
- I don’t believe that scrapie and MV/OPP surveillance is going to take off in the sheep industry until there is some funding to help cover the costs of the tests for producers.
- National Representative BSE Surveillance sampling. Sufficient resources were not available in key geographical areas (eg AB/SK).
- National surveillance. Each province has a different approach and not a unified national approach.
- National surveillance data sharing. Numerous reasons but data platforms, group driving the collection, inability to share or not sharing data for other reasons.
- Surveillance program in BC has been delayed and is not as extensive as it could be, so I guess that's a partial failure. Mostly due to pushback from industry being worried about lack of compensation for non-reportable AI.
- Transfer of laboratory testing: due to reluctance of industry to pay for testing, CFIA is not in a position to transfer some of the lab testing, for the last 10 years.

Information sharing and Collaboration: 13

Survey comments:

- Canadian Animal Health Network - disbanded after 6 years due to reallocation of staff and resources.
- Changing of the current legislation LIDA. Zero support from the provincial government.
- CINPHI lab data integration. Too many different lab information management systems, too many voices with opinions on case definitions, lack of good middleware.
- Development of a system clarifying decision-making processes during a crisis. Too complex, roles and responsibilities are poorly defined, too many groups involved.
- Linkage between ATQ and CCIA to provide a national animal movement database and tracking system. Failure due to lack of willingness to work in Canadian industries best interest across regions.
- National Animal Health Strategy. Failed because it was too broad in scope and led by a closed group in CFIA without industry collaboration.
- Telephone Town Hall - if the timing is not perfect it is hard to get a broad enough attendance.

Emergency Response Initiatives: 10

Survey comments:

- Emergency response plans have been documented and some have been tested at the "high level' with gov't and industry associations but these "pilots" have not included livestock producers or practicing veterinarians.
- A few years ago there was a incident of complete failure on the government's part…because there was no emergency response plan in place and there are obvious barriers to sharing information in a timely manner.
- All the emergency planning in the past has fallen by the way, its not up dated. and in a few years forgotten.
- Canadian Vet Reserve… needs support for training, needs clear rules of engagement.
- Contingency plans do not have the details relevant to real disease emergency response and are usually not updated annually.
- National Emergency Response Teams - too expensive to maintain so when budgets were cut, these programs were shut down. Regional teams work better and are cheaper to operate.
- CFIA has informed us that practicing vets will not be helping in any "emergency response plans" which is a mistake given the lack of sufficient numbers of and competent livestock vets within CFIA.
- Livestock Market Interruption Strategy. This has been a long-standing initiative, but I am just not sure where it is at or whether it has served its original purpose.
- Federal Governments Plant and Animal Health Strategy (PAHS) sets a broad policy direction, but seems to lack momentum and implementation of practical options.
- National All-hazards training and preparedness - lack financial backing and a champion.
- National Emergency Response TEAMs-failed due to lack of funding and prioritization
- Table top exercises on FMD etc.
- The veterinary reserve. the interest was not maintained and drills were not conducted.

Biosecurity: 9

Survey comments:

- Biosecurity, particularly in terms of transporting poultry to the slaughterhouse. Basic biosecurity rules are generally applied in barns. On the other hand, when it comes to gathering birds and shipping them to the slaughterhouse, as well as cleaning of the trucks and trailers, it is appalling! Nobody makes any investment.
- Be Seen Be Safe has been less effective than it should be, I believe due to lack of coaching and set up at the "management" level. For instance, a hatchery vet should have good oversight of information pertaining to farms supplying them, or their hatchery fleet, but program coaching did not quite get that far. That being said, the potential is still there to use this program more effectively.
- Chicken Farmers of Ontario bought biosecurity/disease response trailers but they were never used. This initiative was not successful as CFO did not do thorough investigation to realize that they would not be allowed onto a reportable disease positive farm.
- CSHB On-Farm Biosecurity Program - while listed as a success above, I also consider it a failure as there was no mechanism for having it continuously reinforced with swine producers.
- DFC ProAction Biosecurity Program - just beginning but unlikely to prepare for or manage any serious dairy health risks - too superficial , lack of producer education.
- Our import regulations need to be more strict to prevent invasive species and people importing exotic/dangerous animals into Canada. We should also require more than just a valid rabies vaccination for dogs/cats (i.e consider following Australia's strict import regulations).
- Trying to reduce the amount of sheep in our immediate area. Sheep can carry a disease that is fatal to bison. The attempt to protect our herd has failed because there is no regulation to prevent people from bringing sheep herds close to bison herds.

Animal Welfare/Codes of Practice/Transportation: 6
Survey comments:

- As mentioned above, I believe the humane transportation inspections need to be updated. They are often not prioritized, or conducted between 8-4pm when many compromised animals are transported outside of these hours.
- Not specifically a failure, but it is a failing: producers are not made aware of the Farm Animal Codes of Practice and how they should ensure they meet the minimum requirements and move towards meeting the recommendations.
- Some examples with Swine Transportation.

AMR/AMU: 4
Survey comments:

- Implementing antibiotic free programs in farms that weren't ready can lead to animals being withheld antibiotics to maintain premium. A proper program allows individuals to be treated.
- Monitoring the amount of antibiotics used: It takes too long to arrive at something, things must advance faster.
- National Antimicrobial Benchmark. Lack of willingness for provincial cooperation.
- The restriction of veterinary drugs to producers - the cost of farming has jumped significantly because of it.

Vaccination: 4
Survey comments:

- Bring in vaccines to deal with current health issues. Failure of government (federal) and academic institutions to support Canadian poultry in developing or providing access to new vaccines to help with current disease pressures.
- CWD vaccine development.
- Preconditioning cattle by vaccinating prior to entry into feedlot. Failed because of unreliability of confirming pre-feedlot vaccination and the ready availability of antibiotics to control disease in the first month of the feedlot before feedlot vaccination takes hold.
- Pre-weaning vaccination of calves destined for feedlot a good idea, but producer received no measurable financial benefit for it - felt feedlots benefited from their work and money.

Zoning: 4
Survey comments:

- The protocol aimed at defining a risk zone failed to contain an outbreak of infectious laryngotracheitis on the North shore in 2018. Probably caused by a lack of experience and a new protocol that had never been implemented.
- Zoning of Canada for CWD - failed because of political interference and there is not a recognition that with fixed resources, if they are reprioritized to another approach / area then something previously done has to be given up.
- West Hawk Lake/Zone Canada - shuttered in 2013 due to lack of funding.
- West Hawk Lake zoning initiative. WHL appeared to be effective until the money ran out because it was supported based on short-term project funding rather than long-term program funding.

Training and Education: 3
Survey comments:

- Continuing education in poor location and very costly.
- Having a team of veterinarians prepared. There has not been any consistent or regular interactions to prepare veterinarians that may be needed. Lack of practical training and regular communication.
- Training and exercises have been done with industry, government in the past - but they need to be ongoing! People and faces change and knowledge is lost - need to keep passing on this information and best practices throughout the years.

Mass Depopulation: 2

- CCIA has verified who has captive bolt available in case we have to euthanize a large number of farm animals. Not sure if the initiative failed or not...
- Development of mass depopulation emergency response capacity. Industry is not well positioned to maintain excess/idle capacity. This is involves maintaining trained personnel, equipment maintenance, etc.

Other: 16

Survey comments:

- On farm programs like the regional Johne's initiatives, need national basis to be sustainable over time.
- Compensation program for losses due to illness on farms (animal mortality insurance).
- I would say this is not a failure as the outcome did create something for fellow industries stakeholders to follow. The AI Emergency Preparedness group was a great way for many stakeholders to get together and share ideas and put pen to paper to create a reference binder. Unfortunately, due to lack of staffing, resources, etc., this group has not met for many years and the resource binder could do with some updating.
- Care and control across supply chain with limited consequences for poor practices. Internally didn't initially have protocols for reoccurring issues.
- Committee on Equine Well-Being; no follow-up by the MAPAQ, just an annual meeting by phone and then nothing.
- I hired a local contractor (without post graduate experience) to review rabies responses and was not satisfied with the result.
- initiatives in conjunction with activist groups
- Ontario's Neonicotinoid Regulations -- again, too limited and too late, and too specific to corn and soybean production; needed to include all systemic pesticides used in all types of agricultural production.
- Significant work and cooperation between the industry and government has taken place over the years to develop an approach to avian influenza prevention, preparedness, response and recovery that works well for the poultry sector, and is continually improved. It is important that a potential new governance model does not have unintended consequences or diminish this work or processes already in place.
- Protecting agriculture producers from animal rights groups

Reasons for initiatives being unsuccessful

Figure 20 shows a summary of given explanations for the failure of the above-listed animal health initiatives and areas. “Lack of funding/support” is the most commonly cited reason for failure, followed by “Lack of producer education/engagement” and “Logistical/practical oversight”.

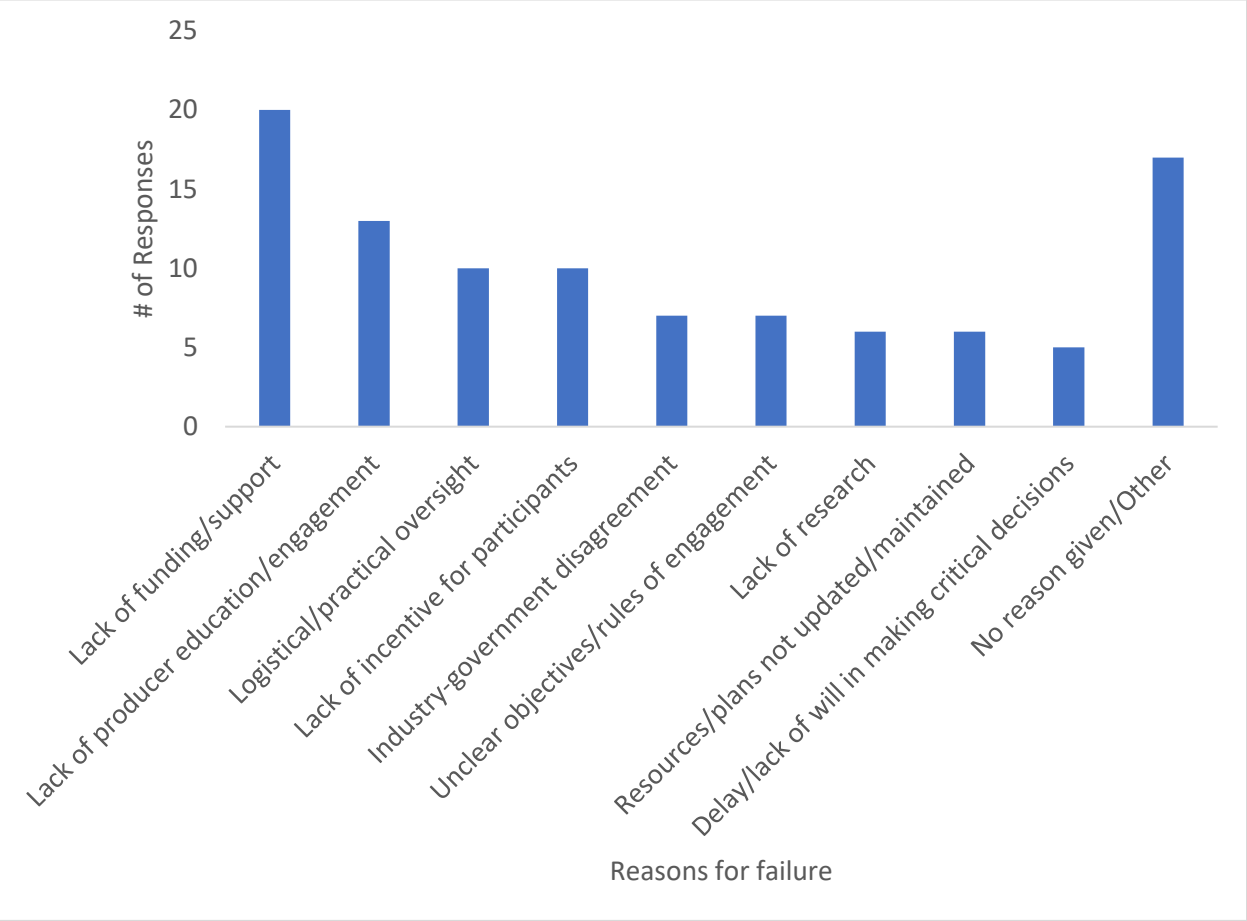


Figure 20. Reasons for failure of various Canadian animal health initiatives. This figure was created from 101 reasons for failure given by 131 respondents to this question.

Question 5: What are the top three most critical/urgent areas that need addressing within Canada's animal health system to better manage animal health risks?

This question allowed participants to enter 3 open-ended answers. Though the question is phrased as a ranking, for simplicity the results were analyzed holding all answers equal. "Biosecurity" was the most commonly cited critical/urgent area, followed by "Surveillance" and "Traceability" (Figure 21).

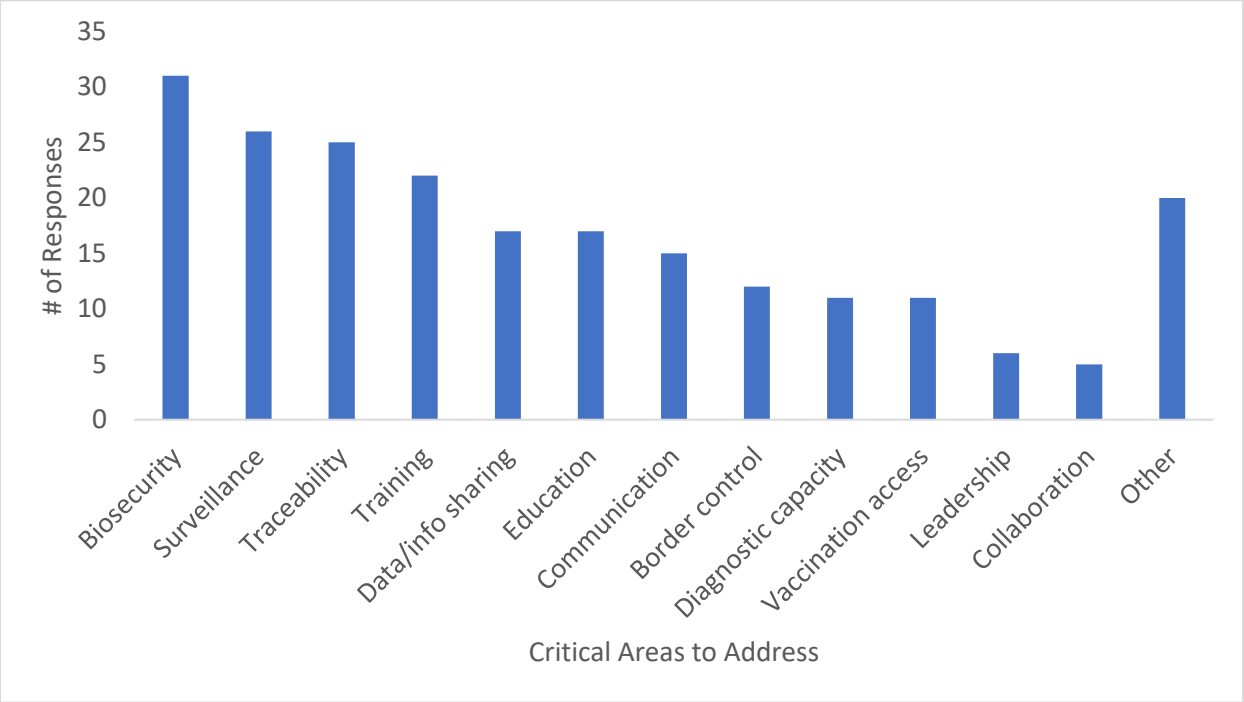


Figure 21. The most critical areas within Canada's health system that needing addressing to better manage animal health risks. This chart was generated using 218 responses from 148 respondents.

The Other category included "exercise", "medication approval", and "cost sharing". There is no category breakdown for this segment as most replies either were or were easily distilled into one-word answers.

Question 6: Please rate the importance and readiness of each of these areas in terms of animal health emergency management on a scale of 1 to 10 (1 = not important/poor readiness; 10 = extremely important/excellent readiness).

This question asks respondents about the importance vs. readiness of 12 areas relevant to animal health emergency management. The 12 areas are:

1. Knowledge transfer to producers
2. Biosecurity implementation
3. Diagnostic laboratory surge capacity
4. Procedures and protocol development
5. Animal ID and traceability
6. Surveillance systems/networks
7. Integrated data sharing
8. Industry protocols for voluntary cease movement
9. Regional zoning
10. Veterinarian (and para-veterinarian) surge capacity
11. Capacity for depopulation and carcass disposal
12. Compensation for producers

From the responses, on average, most of these areas are ranked highly important with medium readiness.

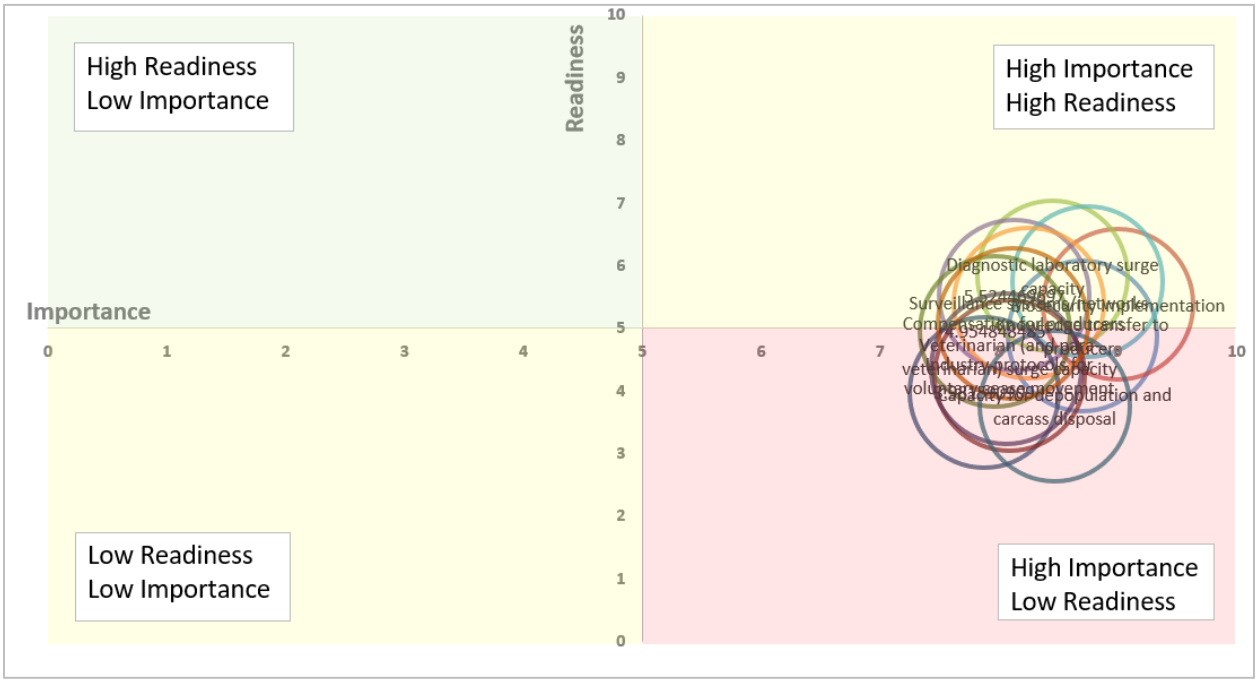


Figure 22. Importance vs. readiness of 12 areas relevant to animal health emergency management. The green quadrant indicates the lowest priority (High Readiness, Low Importance), yellow quadrants indicate intermediate priority (Low/High Importance, Low/High Readiness), and the red quadrant indicates high priority (High Importance, Low Readiness). 115 respondents answered this question.

We developed an **Urgency Index (UI)** to combine Importance and Readiness:

Urgency Index = Importance - Readiness

This returns a value from -10 to 10, with 10 indicating an area of utmost importance and no preparation, and thus the highest urgency to respond.

From Figure 23, "Capacity for depopulation and carcass disposal" has the highest UI, followed by "Integrated data sharing", "Industry protocols for voluntary cease movement", and "Knowledge transfer to producers" in close succession.

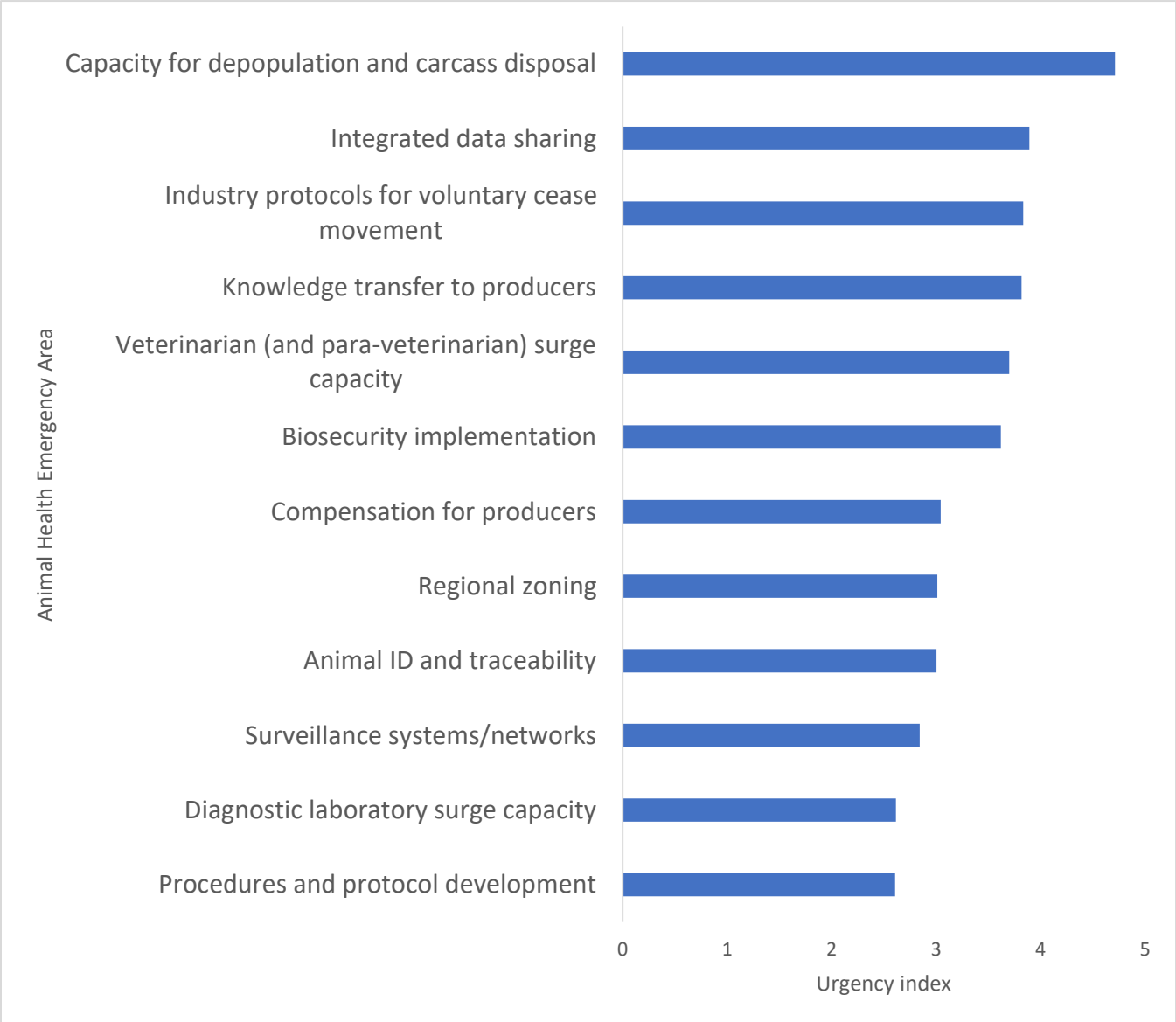


Figure 23. Canadian Animal Health Emergency Areas (AHEAs), ranked by Urgency Index (a measure of the area's importance and readiness).

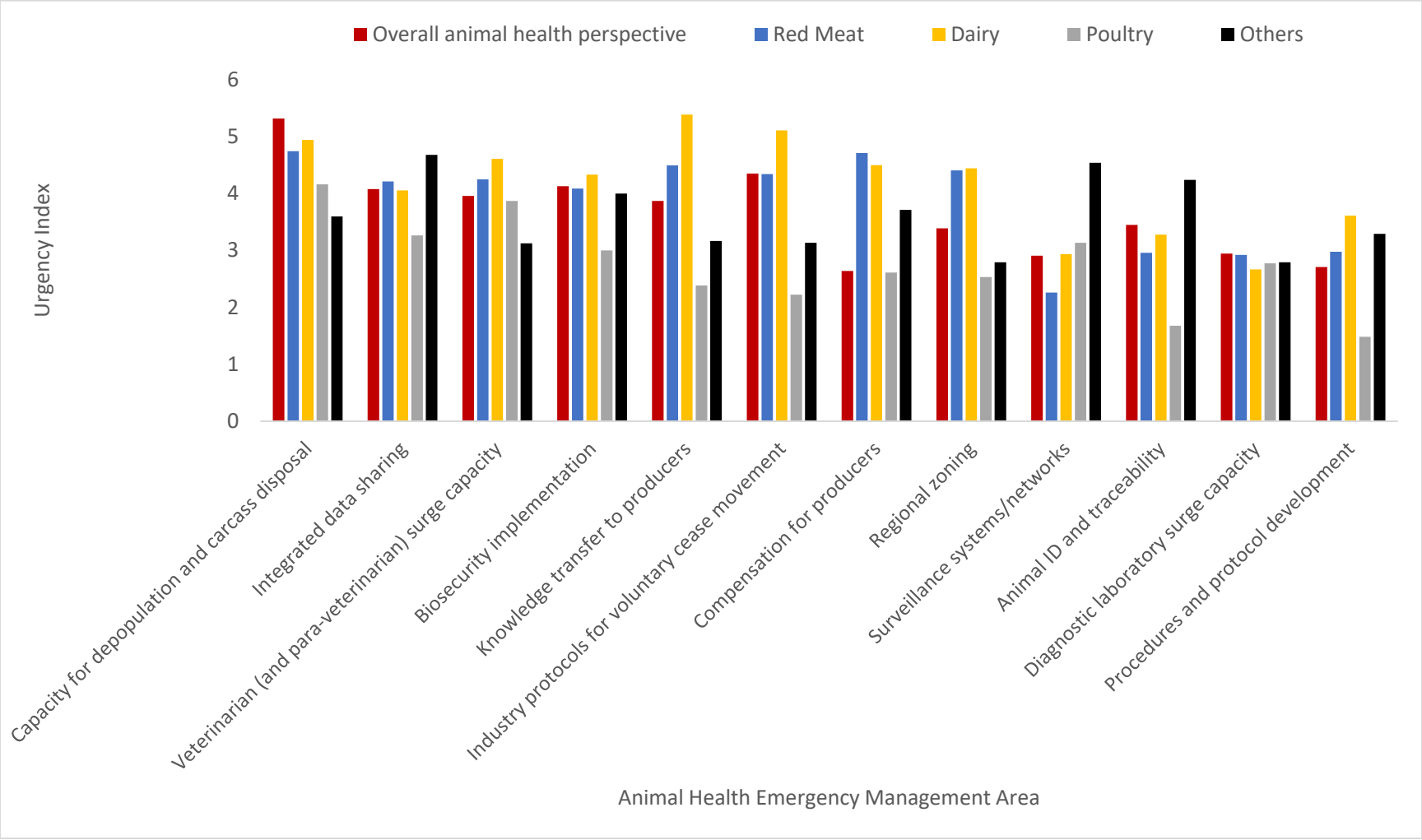


Figure 24. Canadian Animal Health Emergency Areas (AHEA), ranked by Urgency Index (UI) and stratified by industry perspective. AHEAs are ordered based on the average UIs for each category, across all respondents. The higher the UI, the more critically that AHEA needs addressing. The Overall animal health perspective answered the survey from an overall perspective (not a specific species) (106 responses); the Red Meat category includes those answering from a beef, cervids, goats, sheep or swine perspective (111 responses); the Dairy category had 22 responses, the Poultry category had 41 responses, and the Others category includes the equine industry and all other responses (29 responses). Note that in this figure, respondents were given the choice to enter multiple perspectives, and each entered perspective was counted as a separate response.

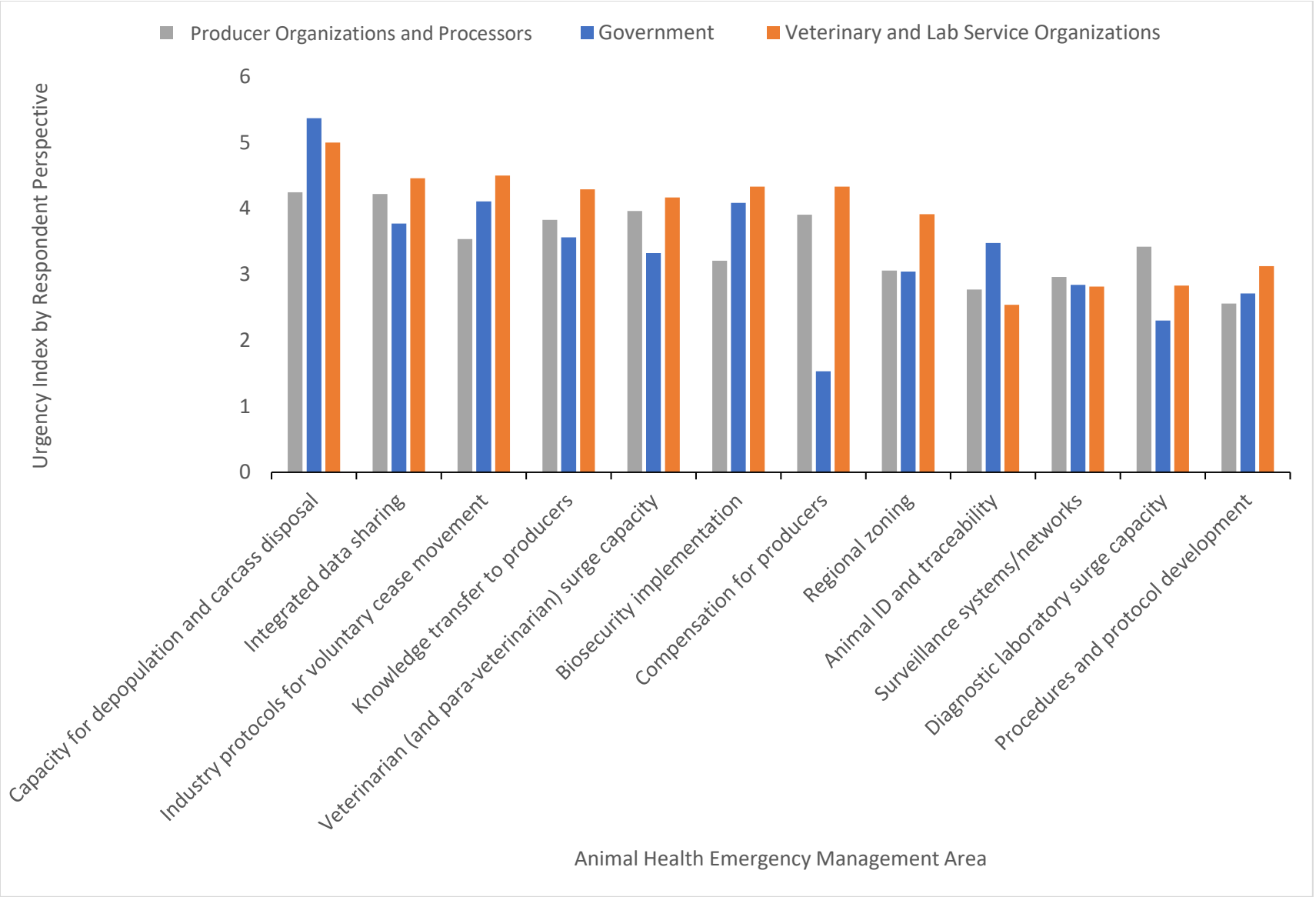


Figure 25. Canadian Animal Health Emergency Areas (AHEA), ranked by Urgency Index (UI) and stratified by respondent perspective. AHEAs are ordered based on the average UIs for each category, across all respondents. The higher the UI, the more critically that AHEA needs addressing. The number of respondents were 63 for Producer Organizations and Processors, 60 for Government, and 36 for Veterinary and Lab Service Organizations.

Question 7: Thinking about the items above that you ranked with low "readiness", what potential solutions do you see to deal with these challenges?

This open-ended question asked respondents for potential solutions to the items they ranked with low "Readiness" in Question 6. The responses were summarized into categories.

The category with the greatest number of responses was "Producer training/Education/Collaboration", followed by "Mass depopulation and disposal/response planning" (Figure 26).

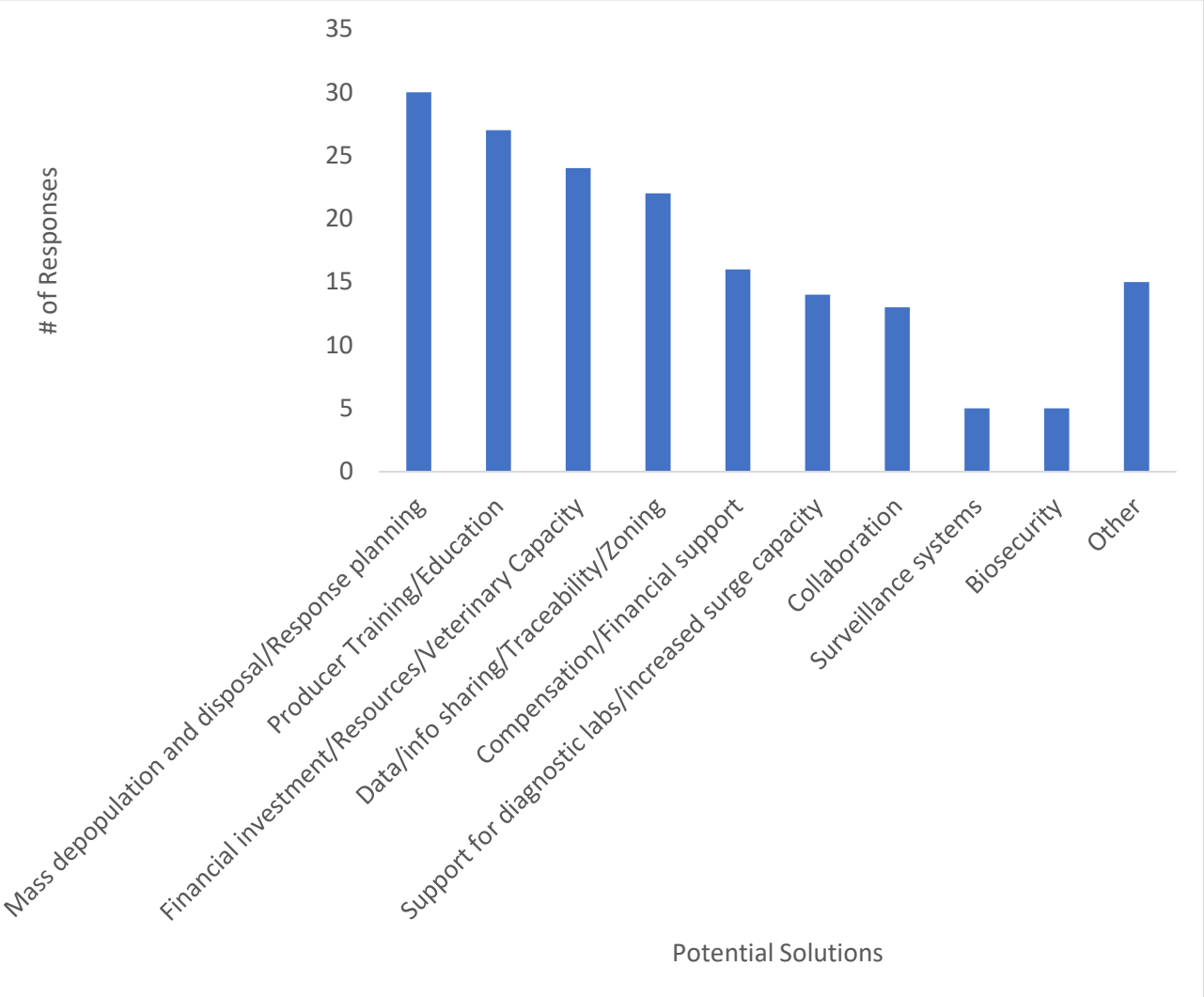


Figure 26. Potential solutions to the areas ranked with low "readiness" in question 6. This figure was created using 156 replies from 117 respondents.

Category breakdown

Mass depopulation and disposal/Response planning: 30 responses

Examples:

- "Carcass disposal planning ahead of emergency."
- "On questions of depopulation, requires an open and frank discussion about who has the capability (e.g. military)."
- "Build industry capacity for depopulation."
- "A well thought out and documented action plan, including roles, responsibilities and accountabilities."
- "Need to build national networks and increase capacity (veterinary surge and/or technologies for speedy depopulation."
- "Defining a NWT agriculture sector emergency plan."

Producer Training/Education: 27 responses

Examples:

- "Producers actually engaging and thinking that they are a risk factor."
- "Industry must be prepared to be the driver for change. There must be a concerted contribution of accepted responsibility and resources rather than complacency while waiting for government to fix it."
- "Organized exercises and training."
- "Knowledge transfer to producers. Make it a mandatory requirement for producers to attend CFIA info seminars."
- "Education of producers and vets - mandatory somehow."
- "There is a need to increase producer participation in disease tracking and traceability."
- "The only way to ensure true readiness across all producers is to legislate it. Voluntary programs are a good start, but if 100% compliance is the goal, mandate readiness (in some form) and provide enforceable regulatory backing to ensure it is done."

Financial investment/Resources/Veterinary Capacity: 24 responses

Examples:

- "More interaction with practicing veterinarians to understand how they will be needed."
- "Train more vets and para-vets."
- "Some provinces have been having issues finding poultry veterinarians. During an animal health situation, it may be hard for some flocks to receive veterinary care."

Data/information sharing/Traceability/Zoning: 22 responses

Examples:

- "Functional traceability system that follows through all movements."
- "Having a fully functional full movement traceability system would be a foundational step in dealing with disease outbreaks."
- "Establish zones for cease movement within our industry to prevent the spread as quickly as possible."

Compensation/Financial support: 16 responses

Examples:

- "Figure out how to compensate producers fairly and quickly."
- "Producer compensation needs to go beyond animal compensation. Industry cleaning and disinfection support is needed."
- "Compensation for producers needs to be rapid, but isn't always. There should be a standard rate per animal, rather than a range."
- "Cost-benefit analysis of producer compensation."
- "Develop industry disease insurance programs."
- "Further discussions are needed around producer compensation."

Support for diagnostic labs/increased surge capacity: 14 responses

Examples:

- "Surge capacity is there, just not formalized. Joint operations can solve much of this issue."
- "National integrated network of networks for diagnostic and surveillance testing."
- "Well funded national initiatives to support laboratory infrastructure (including potential disposal streams) veterinary training and surveillance networks."

Collaboration: 13 responses

Examples:

- "Enhanced partnerships between industry, associations and governments."
- "More cooperation and communication between governments (provincial and federal) and with industry, increased regulations regarding movement reporting, increased use and training for Canadian veterinary reserve."
- "More collaboration/ collaboration between jurisdictions and between government/industry, acceptance that this is a shared responsibility and that support/ funding from all stakeholders is needed."

Surveillance systems: 5 responses

Examples:

- "Increased baseline disease surveillance."

Biosecurity: 5 responses

Examples:

- "Biosecurity – industry must be organized and must consent to invest more in the cleaning of trucks/trailers and apply basic rules for catching crews."

Other: 15 responses

Examples:

- "Changing the way we think e.g. we cannot continue to do things the same way and magically have a different outcome. Accepting responsibility and making the required changes."

Question 8: Do you see opportunities for improved industry/government partnerships in animal health risk management, emergency response and recovery? Can you describe what this looks like?

Respondents were asked an open-ended question about opportunities for improving industry/government partnerships in the animal health field. Responses were categorized into summary groups.

"Communication" and "Engagement" were the two most commonly-cited areas for improvement, followed by "Training/Producer education" and "Data/info sharing" (Figure 27).

Figure 27. Areas with opportunities to improve industry-government partnerships in animal health risk management, emergency response, and recovery. This figure was generated from 157 responses by 115 individuals.

Category breakdown:

Communication

Examples:

- "Addressing the communication gap with producers - ensuring producers understand the implications of a reportable disease outbreak and what their responsibilities are in prevention, preparedness and response."
- "There should be open communication between government and industry throughout the year, not only when in emergency situations."
- "Yes, at the moment there is a significant disconnect between all levels of industry and this needs to change."

Engagement

Examples:

- "All aspects of animal health planning/prep/detection/response and recovery require collaboration to be done effectively. Structures need to be in place to engage all levels and resources need to come from all levels."
- "Government can no longer give a date when a regulation will take effect and leave it up to industry/producers to figure out how to meet the goal, they must stay involved the whole way along and give feedback to progress."
- "Industry needs to be more involved with policy/management procedures/decision making processes that are undertaken by provincial gov't and CFIA in terms of animal health risk management."
- "[Industry] can provide considerable knowledge and value in terms of designing control/response measures that are effective while also being practical and hopefully less disruptive."
- "Need an established working group that would facilitate discussions and preparation of protocols and memorandum of understanding."
- "Yes, working groups with all decision makers for enhanced protocols for emergency management."

Training/Producer education

Examples:

- "Cross-sectoral training and exercises need to be rigorous and regular."
- "Developing a producer awareness and training program that really engages the producer and is at their level (not government and vet level)."
- "Yes. The agency's emergency Preparedness Teams must have routine training events with industry, so by the time a response is indicated, those producers will know the drill, understand the importance of each step, etc."
- "Industry input and expertise is important. In order to incorporate it in a coordinated fashion within different levels of government, industry could train and develop teams using IMS principles."

Data/Info sharing

Examples:

- "It would be a central database of farm animal owners (all of them), where they are and what they produce. It would also include information on when and where they transport animals as well as preventative health measure undertaken and any transmittable disease exposure."
- "This includes assuring a national requirement for provincial diagnostic laboratory capacity. Requiring documentation of all animal movement (e.g. trucking manifests, auction barns) is critical. There is opportunity for improved digital requirements but at this point, most animal movement is unrecorded - particularly small ruminants."
- "National, provincial and municipal government bodies should consider collaboration respecting gaps in the education and information systems that prevent trickle-down of critical information."

Question 9: Do you see opportunities to simplify or streamline the animal health stakeholders, organizations and networks? Please explain.

This question asked a yes/no question and followed up with an open-ended question. The majority of respondents answered "yes" to this question (Figure 28), and their explanations or suggestions were summarized into categories of yes-leaning reasons (Figure 29) or no-leaning reasons. This was done because some respondents answered "no" to the first part of the question, but still gave "yes-leaning" suggestions or comments for simplifying animal health organizations. We have focused on the "yes-leaning" reasons in our analysis below.

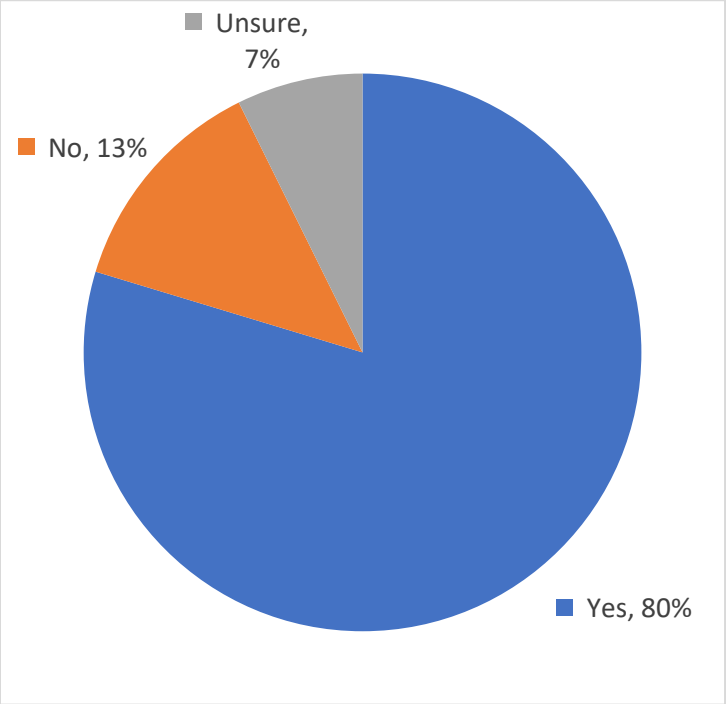


Figure 28. The percentage of respondents who replied yes, no, or unsure when asked if they saw opportunities to simplify/streamline animal health stakeholders, organizations, and networks. 102 people responded to this part of the question.

Yes-leaning reasons

"Consolidate similar organizations, avoid duplicate efforts" was by far the most common response. "Increase communication across all levels and sectors", "Centralize efforts with one or two organizations", and "Clarify existing organizations and their networks" were the subsequent most popular opportunities and had a similar amount of responses.

Many people expressed frustration that resources were being wasted to do work that had already been begun by previous efforts, and a lack of communication and clarity around existing networks was often cited as the cause.

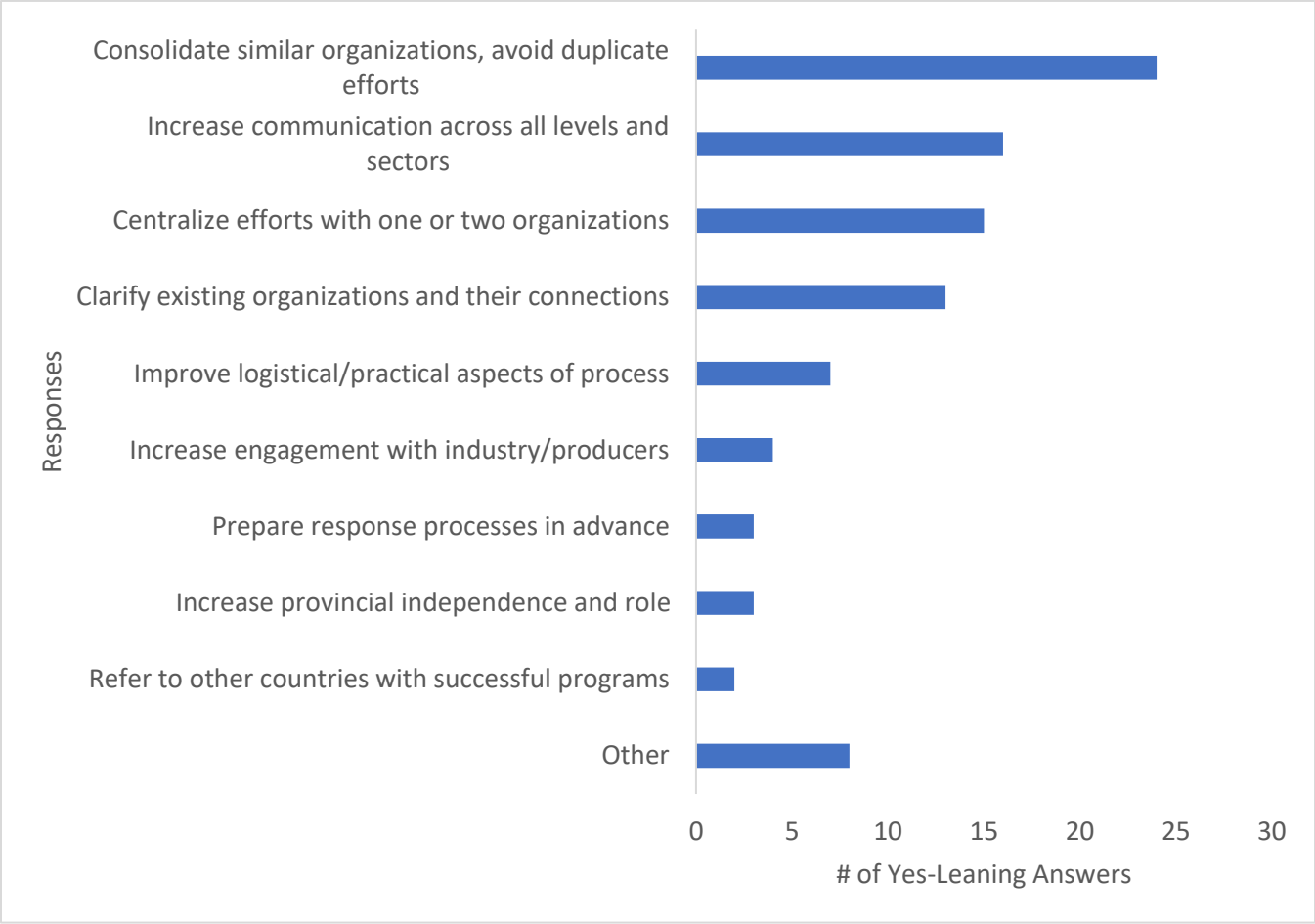


Figure 29. Suggestions for streamlining animal health stakeholders, organizations, and networks. This figure was generated from 109 replies from 102 respondents.

Category breakdown

Consolidate similar organizations, avoid duplicate efforts

Examples:

- "There seems to be a few Associations or Organizations doing similar work- this needs to be streamlined."
- "Continued development of the Animal Health Strategy and role of organizations like the NFAHWC to coordinate efforts; avoid duplication of effort and spending."
- "I am not aware of what other species groups have accomplished but if there are initiatives that each group have worked o that can be adopted across other species/commodity groups, we can reduce redundancy and not re-invent wheels!"
- "If an effective system already exists there is no need to re-invent the wheel."
- "There is a need to streamline through practical coordination - this would eliminate overlaps and encourage focused and effective response."

Increase communication across all levels and sectors

Examples:

- "Engaging up front and at all levels will reduce the duplication of efforts of various levels of gov and industry attempting to develop solutions on their own that all work at cross purposes from another."
- "Correspondence between provincial offices and with the national offices, as well as across sectors, in order to share existing emergency management plans, with the opportunity to share what is and isn't working."
- "More national networking, and government not passing everything off to industry."

Centralize efforts with one or two organizations

Examples:

- "Once a single federal program - funded and professionally managed - is in place and assuming responsibility for FAD control."
- "One source of information collection would be a great benefit rather than the disconnect between different agencies collecting different information."
- "Consider having working groups from different areas funnel information into national representation."

Clarify existing organizations and their connections

Examples:

- "The creation of networks like CAHSS, with appropriate mapping of stakeholders can help visualize stakeholders and improve interrelations between organizations."
- "I would say that there are opportunities but it is important to understand the interrelationship amongst present organizations and networks."
- "There are too many initiatives/programs/strategies right now and there is confusion about them."

Question 10: Are the roles and responsibilities clear when considering a reportable disease (federally or provincially)?

This question was another two-part question: a yes/no answer followed by an option for respondents to elaborate. These elaborations were then categorized into no-leaning and yes-leaning questions.
The majority of respondents answered that yes, the roles and responsibilities are clear when considering a reportable disease (Figure 30).

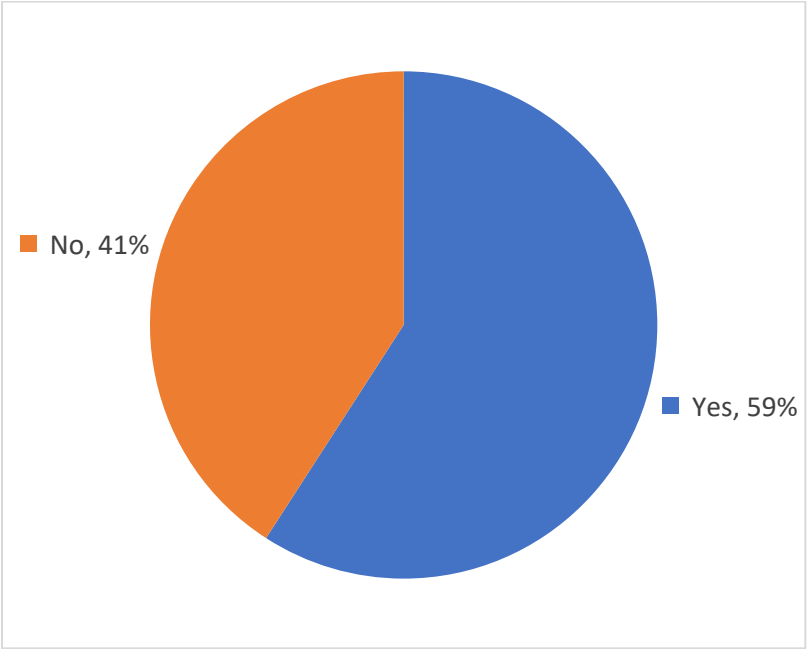


Figure 30. The percentage of respondents answering yes/no to whether or not roles and responsibilities are clear when considering a reportable animal disease. This chart was generated from 137 responses.

No-leaning reasons

"Lack of industry understanding/engagement" was the most commonly-cited no-leaning answer (Figure 31). Specifically, industry and producers were said to not understand the roles due to a lack of education and awareness campaigns by the regulatory agencies. "Lack of clarity around reporting" and "Unclear on general roles and responsibilities" were also named multiple times.

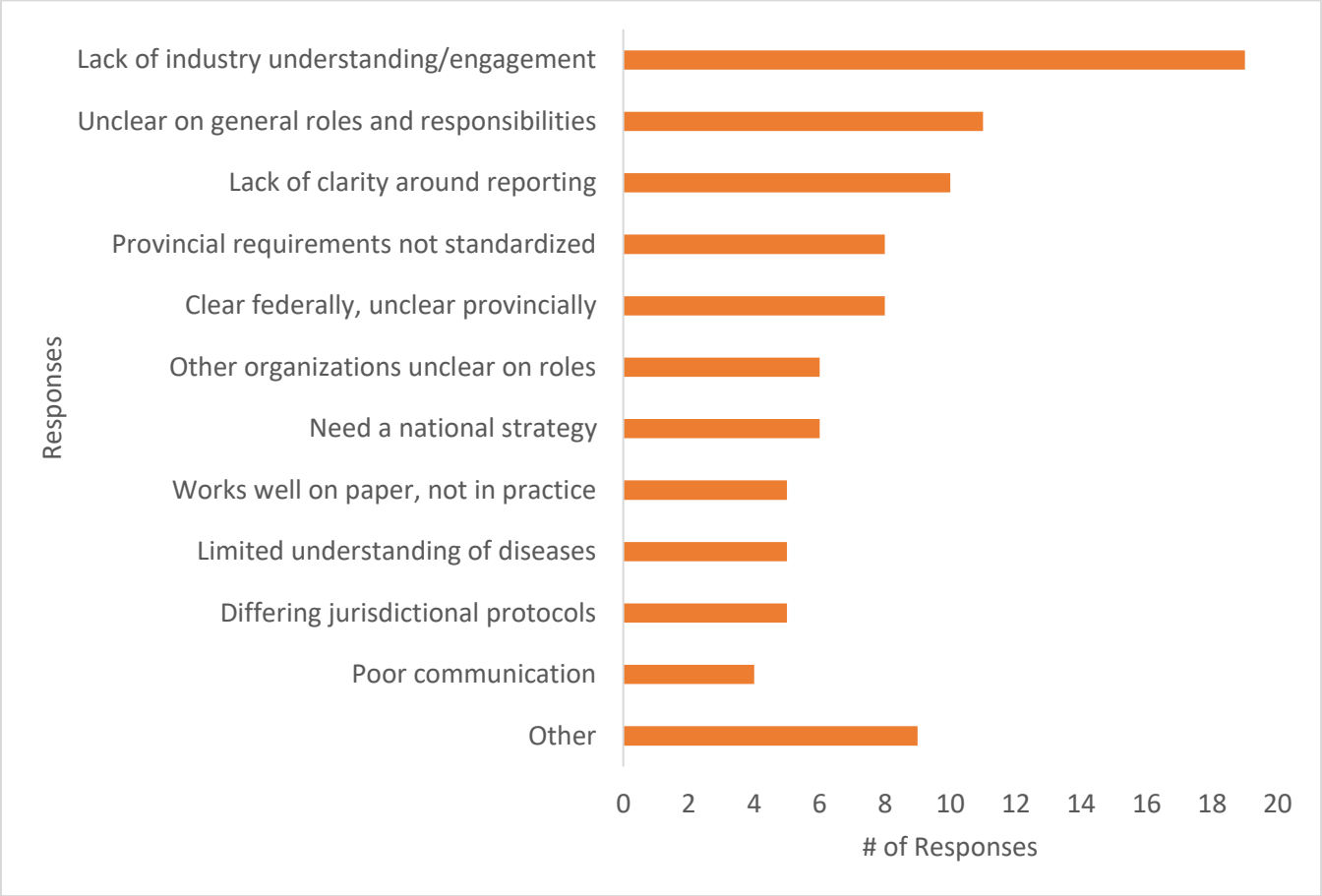


Figure 31. No-leaning reasons for why roles and responsibilities are unclear when considering a reportable disease. This figure was generated with 96 responses from 137 respondents.

Category breakdown

Lack of industry understanding/engagement

Examples:

- "These lists are just that. Lists on a website, that almost no producer or industry representative even know exists. How can they report them if they know nothing about them? If the government is not willing invest in educating industry and producers about these diseases how do they possibly expect anyone to comply (aside from a regulated professional)."
- "In BC (and probably elsewhere in Canada) there are livestock producers that have absolutely no knowledge of reportable diseases - and unfortunately I've met a lot of them."
- "Provincially they have no idea what is going on and or relevant to the industry."
- "Without any local authorities clearly identified to be the primary point of contact - who are the stakeholders, vets or farmers expected to call?"
- "The roles and responsibilities in cases where disease transmits from one province to another is not clear. Additionally, the roles and responsibilities in all cases need to be clearly explained for those not involved. Producers often are frustrated in these situations when they don't understand the process."

Lack of clarity around reporting

Examples:

- "Haven't had to report a reportable disease yet - but would not know without some research how to report, to whom, etc. In talking to people - hear of frustration of others."
- "Who's on first, especially when it's a reportable zoonotic disease that is both provincially and federally reportable? It's even more baffling when first nations or parks are involved."
- "There are always gaps, especially in rural areas or on weekends/after hours, to getting the info to the correct person(s) quickly."
- "I have no idea who is supposed to be informed and how."

Unclear on general roles and responsibilities

Examples:

- "Not sure producers (or even veterinarians) really understand the process when a reportable disease is suspected. e.g. what happens after reporting."
- "I struggled with this question. The roles and responsibilities might indeed be clear, but I may simply not understand it. It may be time to ask some fundamental questions, such as why is the 'reporting' and 'notification' functions shared by the two orders of government, and what purpose does that serve?"
- "Not sure. I am not aware of what the legislated roles and responsibilities are presently."

Clear federally, unclear provincially

Examples:

- "Acts and Regulations are in place federally and provincially. But these are poorly understood by people outside these entities."
- "Roles are clear for federally reportable diseases. Less so for provincially reportable diseases or those that may be borderline (e.g., non-H5, non-H7 influenza in poultry)."
- "The only thing that is well defined is the federal role in managing the infected site(s). Even at this level, the role is limited because the federal government will not interfere with the way sick animals are euthanized or eliminated."

Yes-leaning reasons

"General understanding of roles and requirements" was the most common response for a yes-leaning answer, followed by "Trained as part of job" and "Know diseases" (Figure 32). Though more people replied "yes" to the initial question, many people followed up that answer with a complaint or a suggestion for improvement to the current system, and these were considered no-leaning answers.

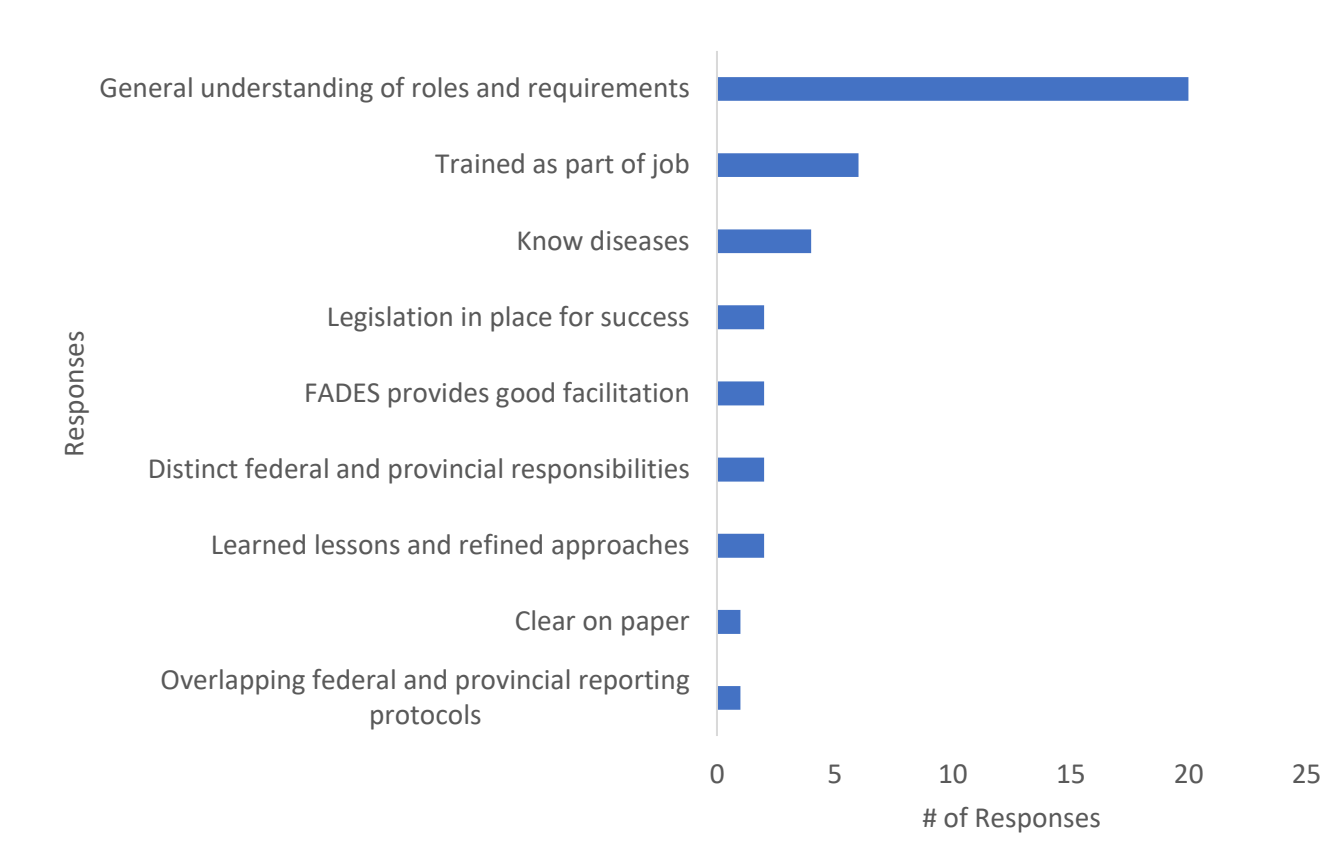


Figure 32. Yes-leaning reasons for why roles and responsibilities are unclear when considering a reportable disease. This figure was generated with 40 responses from 137 respondents.

General understanding of roles and requirements

Examples:

- "Clear to me. Primary legislative authority means that the lead government entity is ultimately responsible to make sure things get done, and has the authority to compel action."
- "Everyone must report to the CFIA. In Ontario just the labs report to the province."
- "Veterinarians are well aware of their responsibilities however producers may be less so. Laboratories have clear protocols are compliant."

Trained as part of job

Examples:

- "As a federal public servant I have a clear idea of what is within my purview. "
- "I'm a vet so I know my role in these areas."

Question 11: Are the roles and responsibilities clear when considering an emerging disease?

This question was a two-part question: a yes/no answer followed by an option for respondents to elaborate. These elaborations were then categorized into no-leaning and yes-leaning questions.

The majority of respondents answered that no, the roles and responsibilities are unclear when considering an emerging disease (Figure 33). There is a large increase between the rates of "no" responses from Question 10 on reportable diseases and this question on emerging diseases, with the majority of people reporting a lack of clarity in what actions to take regarding emerging diseases.

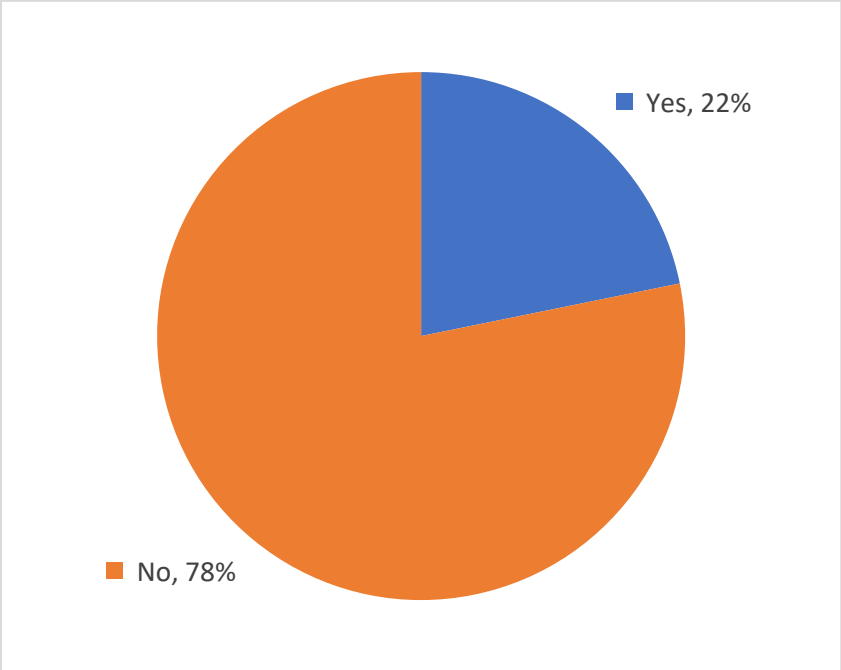


Figure 33. The percentage of respondents answering yes/no to whether or not roles and responsibilities are clear when considering an emerging animal disease. This chart was generated from 133 responses.

No-leaning responses

"Unclear on their own roles and responsibilities" was the most common category for a no-leaning response, followed by "Unclear on roles and responsibilities of others" and "Poor government-industry communication" (Figure 34).

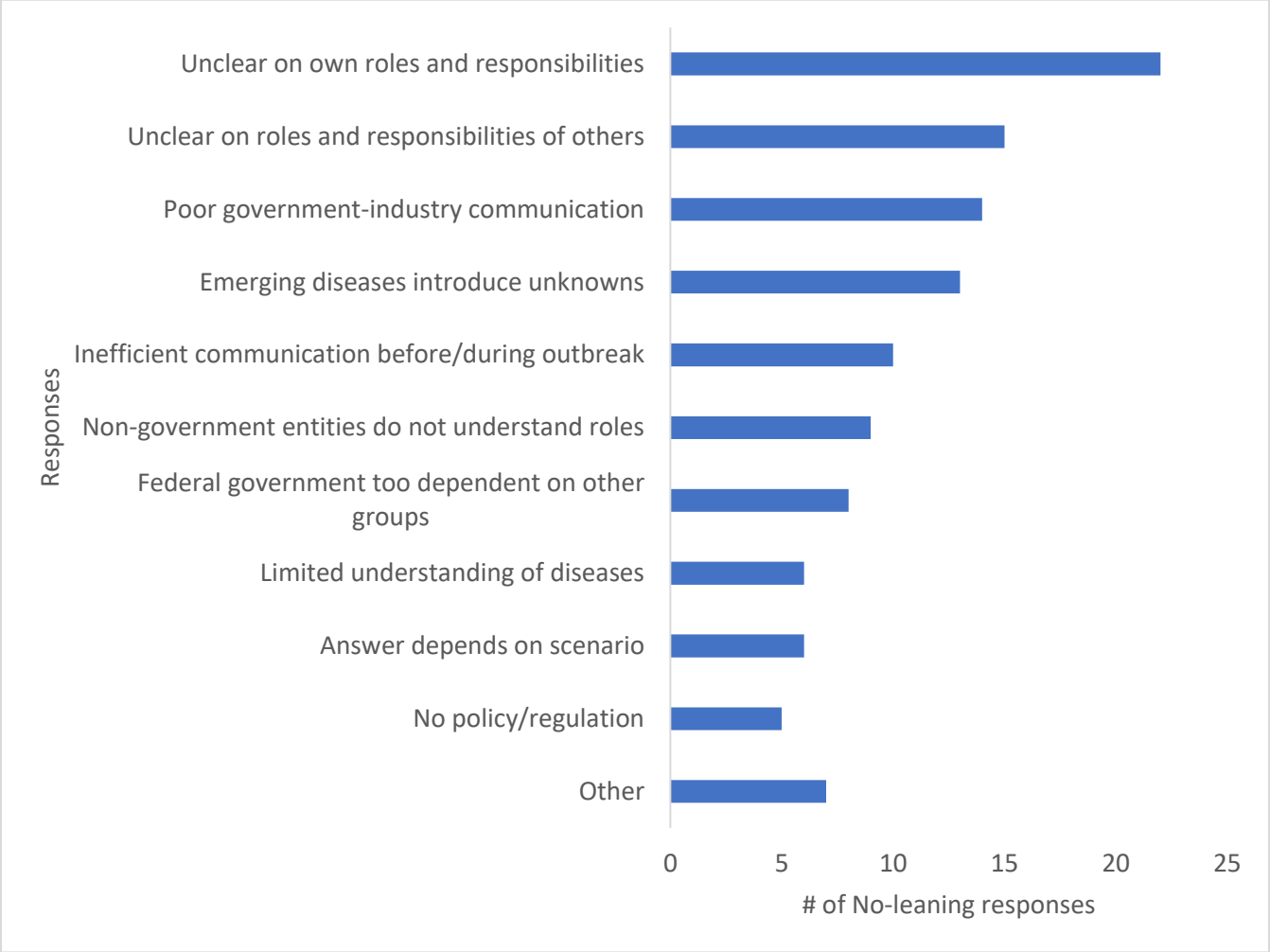


Figure 34. No-leaning reasons for why roles and responsibilities are unclear when considering an endemic disease. This figure was generated with 86 responses from 133 respondents.

Category breakdown

Unclear on own roles and responsibilities

Examples:

- "Not at this time, mostly due to general lack of knowledge and experience about the disease."
- "Frankly I am not as sure as about a reportable disease."
- "Again, the roles and responsibilities are not clear to producers and cause frustration in an already high-stress situation."
- "No idea what they are - other than some are federally reportable and some are provincially."

Unclear on roles and responsibilities of others

Examples:

- "I don't know who defines or declares an emerging disease, so I can't comment one way or the other. Maybe the roles and responsibilities are clear, but I don't know what they are or who's in charge."
- "There needs to be formalized procedures in place describing government and industry roles and responsibilities in the face of an emerging disease. These do not currently exist."
- "I think anytime there is something new there is some determination as to who's role is what..."

Poor government-industry communication

Examples:

- "Without going on to the CFIA website, there is no knowledge transfer down to the producer."
- "I have experienced no meaningful extension on emerging diseases from industry stakeholders."
- "Often, not aware across provinces of emerging diseases and when become it's usually industry working to resolve the issue when government could be notifying industry earlier. If government is aware they should show leadership and accountability to the industry."

There were few yes-leaning responses, but these respondents most commonly reported "Trained as part of job", "Know who to report to" and "Assume same procedures as reportable disease".

Question 12: Are the roles and responsibilities clear when considering an endemic disease?

This question was a two-part question: a yes/no answer followed by an option for respondents to elaborate. These elaborations were then categorized into no-leaning and yes-leaning questions.

The answers to this question were fairly evenly split (Figure 35). The rate of "no" responses is slightly higher than Question 10 regarding clarity of roles surrounding reportable diseases.

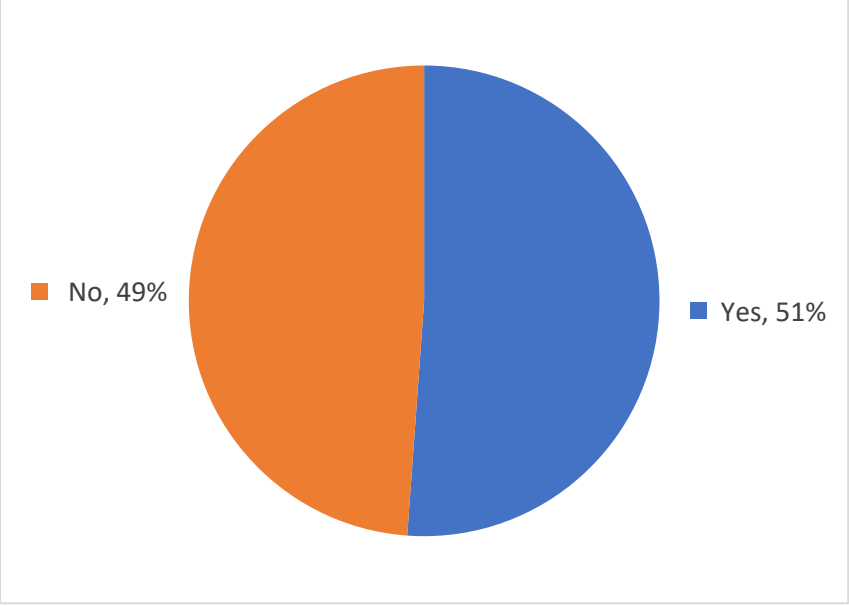


Figure 35. The percentage of respondents answering yes/no to whether or not roles and responsibilities are clear when considering an emerging animal disease. This chart was generated from 131 responses.

No-leaning responses

The largest response category for no-leaning categories was "Generally unclear on roles and responsibilities", which encompasses not just the respondent's own roles and responsibilities but those of all other entities involved in the endemic disease reporting and response process (Figure 36). The second- and third- most common responses were "Insufficient policy/regulation" and "Poor information sharing".

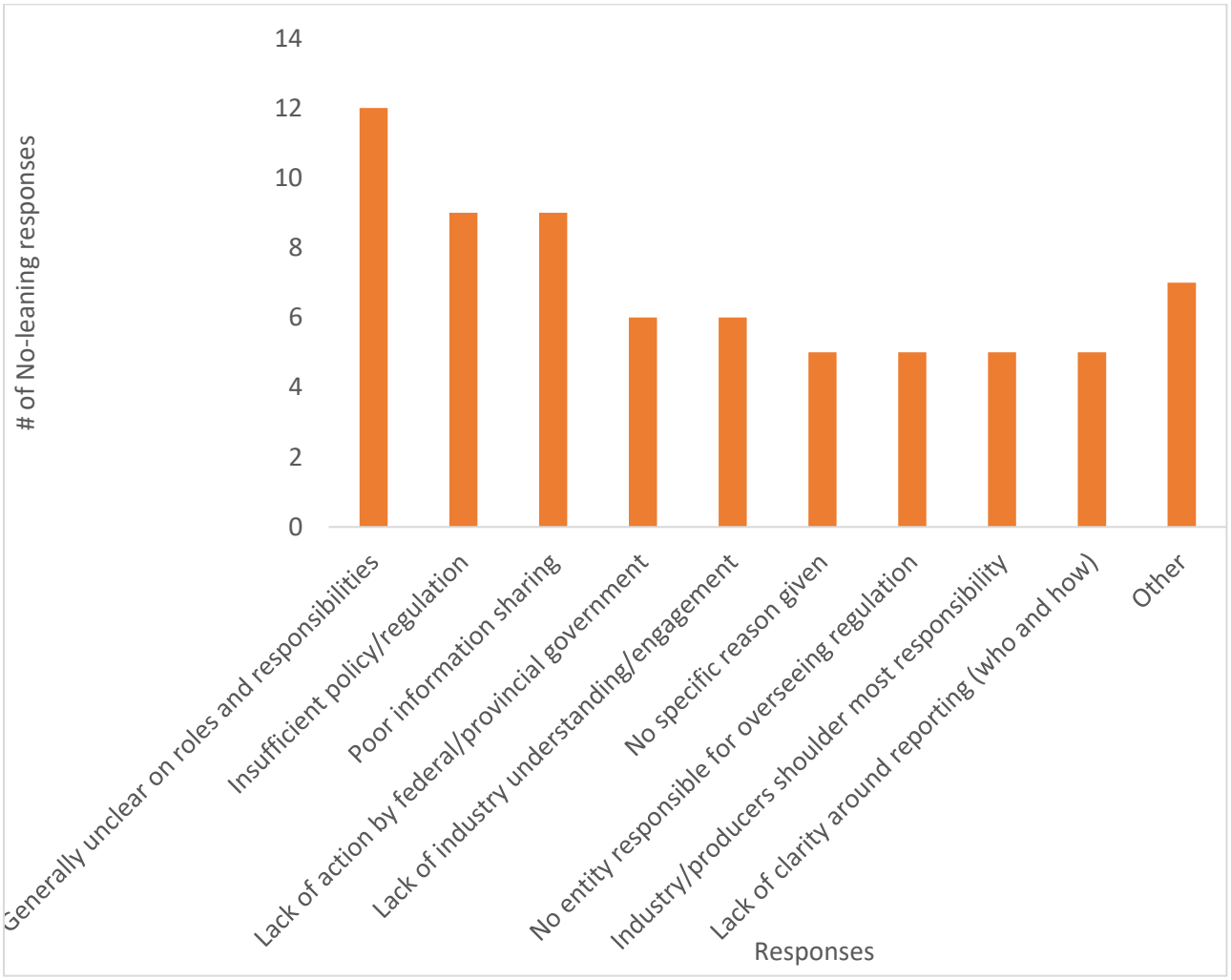


Figure 36. No-leaning reasons for why roles and responsibilities are unclear when considering an endemic disease. This figure was generated with 68 responses from 131 respondents.

Category breakdown

Generally unclear on roles and responsibilities

Examples:

- "This is often less clear, especially when the endemic disease is reportable. I think a response/control is still expected and when it isn't given there are problems understanding why."
- "Since there is less mandatory reporting outlined, it's unclear who takes responsibility."
- "Legislated authorities for both the provinces and federally - but poorly understood outside of government."

Insufficient policy/regulation

Examples:

- "There is no consistent policy nationally."
- "Many roles are historic or picked up by whomever feels the most pressure. No process or logic involved."
- "Not enough regulation or man power to enforce quarantine."
- "To my knowledge there is no federal structured support and implications for endemic disease management at the farm level."

Poor information sharing

Examples:

- "Again, the information isn't being trickled down adequately to the producer. Many times they only know something is wrong if they get an knowledgeable veterinarian out (which is increasingly difficult to find for livestock) or the animal goes to an inspected abattoir."
- "Somewhat but downloading of CFIA diagnostics for the endemic diseases needs to occur. "
- "No discussion with provincial industry."
- "Not enough information."

Lack of action by federal/provincial government

Examples:

- "Doesn't appear that either level of government is seriously interested in control endemic disease in any serious way."
- "The feds essentially stopped doing anything but reporting things like rabies and anthrax cases a few years ago. So clearly, if anyone's going to do anything, it probably won't be the feds."

Other

Include categories such as:

- Confusion about disease list
- More resources required

Yes-leaning responses

The most common yes-leaning response was “Understand own roles and responsibilities”, followed by “Policies in place”, and “Know who to report to” (Figure 37).

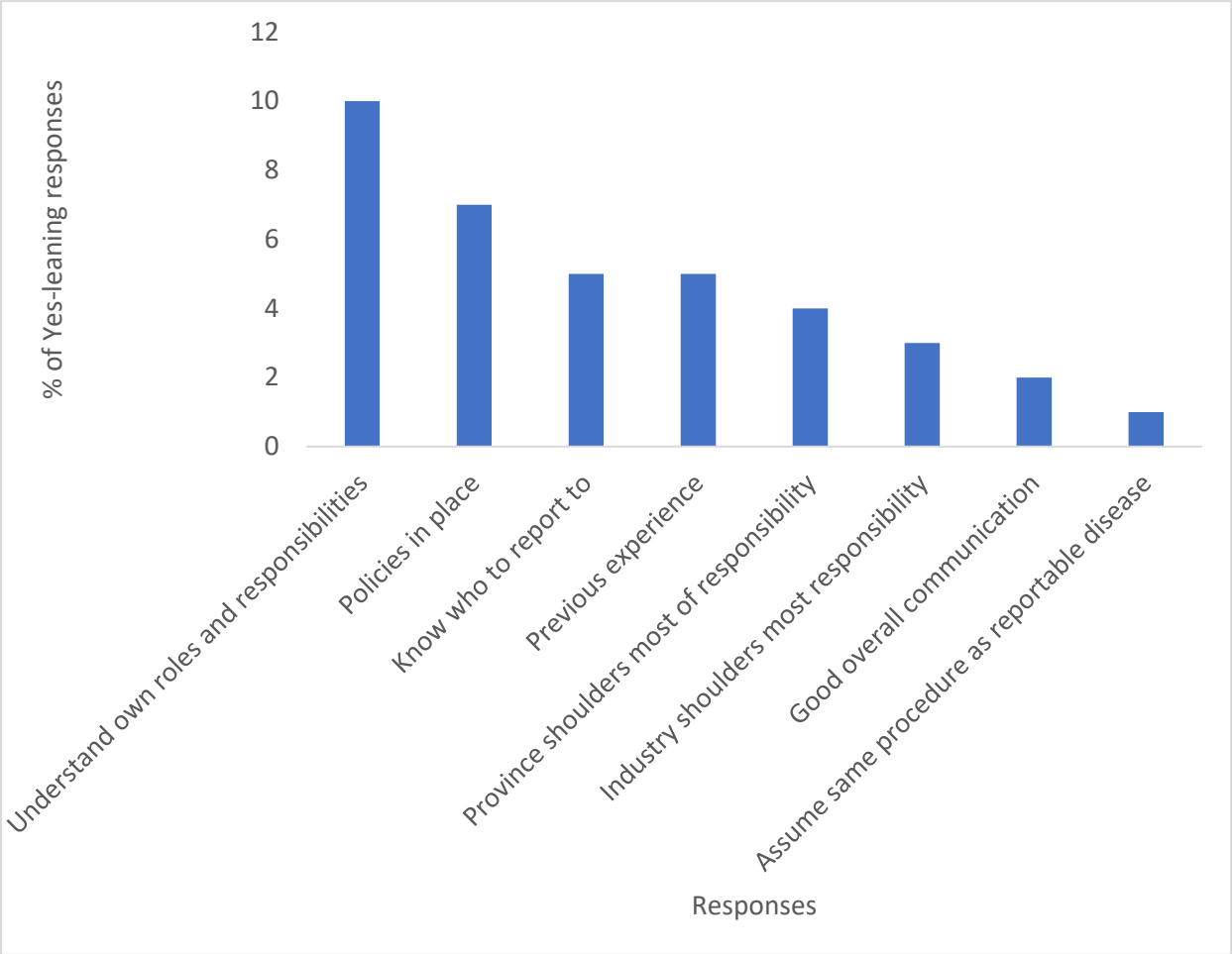


Figure 37. Yes-leaning reasons for why roles and responsibilities are unclear when considering an endemic disease. This figure was generated with 43 responses from 131 respondents.

Question 13: What is your reaction to the Animal Health Canada (AHC) vision and mission?

This was an open-ended question that asked respondents for their reaction to the AHC vision and mission. The responses were then sorted into 3 categories of Supportive, Skeptical, and Not supportive. Specific suggestions for revision were noted separately and summarized below. The majority of respondents were supportive (Figure 38).

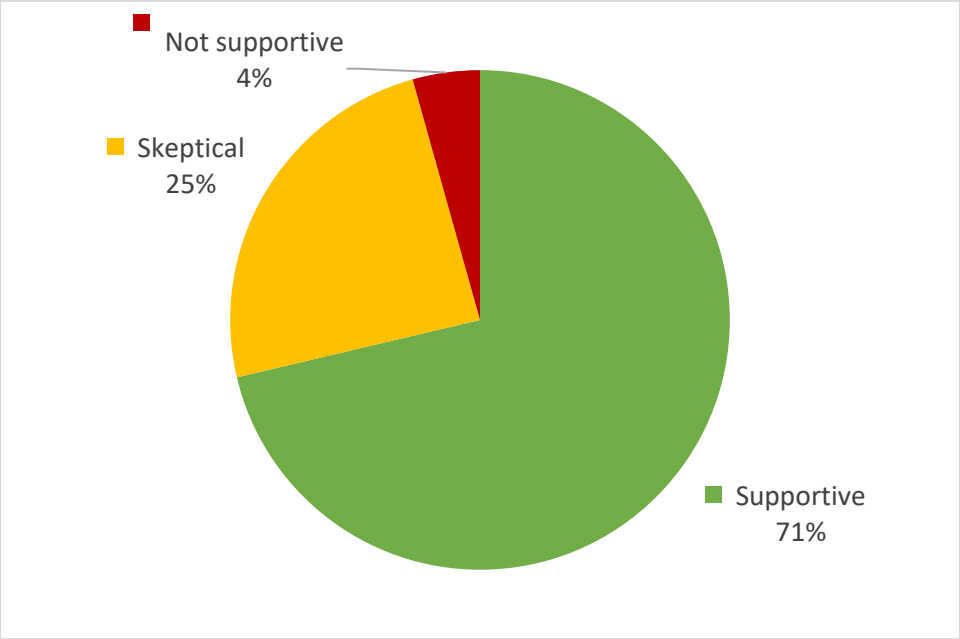


Figure 38. The percentage of respondents whose answers were categorized as Supportive, Skeptical, and Not supportive when asked for their reaction to the Animal Health Canada vision and mission. This chart was generated from 118 responses.

Supportive

Examples:

- "Appropriate from a high-level perspective. A more detailed work plan with specific goals and targets will provide clarification. AHC approaches animal health for all farmed animals, however more detail will allow the nuances between the different sectors (e.g., poultry vs. red meat) to become apparent. It is important to recognize these as a new model is developed."
- "Seems overall appropriate but detailed work items and goals need to be clarified in order to provide meaningful feedback."
- "I think the vision and mission are great and are similar to what I suggested earlier in the survey!"
- "My first thought when reading that was: 'It's about time - this doesn't get nearly the attention it deserves'."

Skeptical

Examples:

- "The idea of collaboration between all stakeholders is positive, but more details need to come in order to ensure these goals are being met in an effective manner. We are wary that a model that contains greater financial commitment from the private sector undermines the existing arrangement for poultry."
- "The policy is fine, but the various groups rarely make it a priority. Consequently, progress is slow and ineffective. Occasionally, there conflicting mandates and uninformed or ineffective leadership to make it happen."
- "Lots of nice words that requires a lot of people to get along in terms of workload, funding, responsibility. Sounds complicated to get a number of stakeholders with slightly different interests to all work together, quickly and efficiently."
- "The proposed vision is so far away from the reality that it makes it 'de facto' unreachable. I would have preferred something more accessible such as 'coordinated provincial and federal actions to manage emerging diseases'."

Not supportive

Examples:

- "It seems to duplicate the NFAHW Council's role."
- "Looks like another layer of government and a bunch of people having meetings in Ottawa. Not something that will actually be effective."

Suggested revisions/detailed comments

Examples:

- "I would suggest this is too Animal Agriculture focussed. Animal Health Canada by name would expand to all important veterinary health issues."
- "If innovation in animal health is driven by research, why is academia not considered a partner?"
- "Partnerships are wonderful but if not structured appropriately will be at the level of the weakest partner and may be inefficient."
- "Though partnerships are the ideal since at the core, industry should be looking after industry. However, there are times where government cannot be a partner, and must be the protector of the greater public good, despite industry. This should be rare, but cannot be compromised."

Question 14: Please describe what a successful animal health governance model in Canada looks like to you.

This was an open-ended question prompting respondents to describe a successful Canadian animal health governance model from their perspective. Replies were categorized in summary categories.

"Inclusive" was the most commonly cited contributor, followed closely by "Collaboration" and "Clear Responsibilities" (Figure 39). Together, these 3 categories made up almost 45% of all responses.

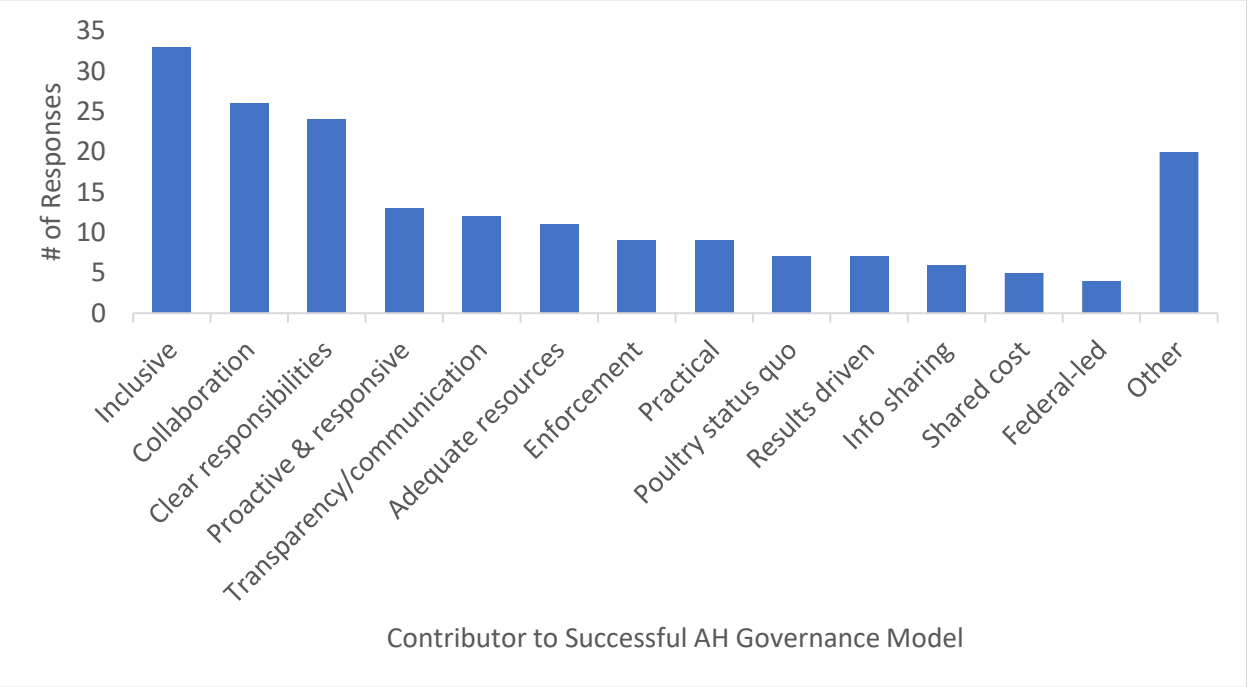


Figure 39. Contributors to a successful animal health governance model. This chart was generated from 186 responses from 108 respondents.

Inclusive
Examples:

- "Strong coordination at the national and provincial/territory level, with engaged stakeholder groups at the national level that can assure the voice of all stakeholders (including veterinarians) across Canada."
- "Representation from federal and provincial government and fed/prov industry leaders headed by an executive director with dedicated staff. Commodity-specific working groups of government and industry representatives with crossover where necessary."
- "All parties in the industry government understand and accept their responsibilities - each carries an equal share of the work and cost."
- "Equal number of voting representatives from each sector, no weighted votes so that each sector has equal weight in voting. Larger industries cannot be given the opportunity to outvote one or more smaller ones with a weighted vote."
- "Equal contribution, responsibility and influence by all members. Federal, provincial, industry."

Collaboration

Examples:

- "A model that lets information flow across borders and between governments and industry to the spot where analysis and action is most needed and valuable."
- "A collaborative effort with dynamic engagement from participants. Targeted goals with time frames needed to provide sufficient structure and opportunities to succeed"

Clear responsibilities

Examples:

- "Field to the top level of government understanding of roles and responsibilities. Open sharing of information across the whole ag industry both up and down, including government. With preparedness from the ground up to the very top levels of government and everyone in between."
- "We need to pool expertise on all fronts to have good animal health guidance and have clear accountabilities."

Question 15: Do you have any other feedback or comments you would like to share as part of this consultation?

Many respondents reiterated points that they had made in the rest of the survey: general themes included the need for collaboration, transparency, and for all groups to have input. Below are some specific quotes from respondents on subjects that were not necessarily captured in the survey:

- "Do not forget that all aspects of the livestock industry are NOT 'Model Participants'. This model should keep in mind all levels of industry ideally to educate everyone to help those parties understand the importance of traceability, biosecurity and proper handling of animals."
- "There are many models around the world on how government and industry can work effectively together; it feels like Canada is really falling behind on emergency preparedness, perhaps due to complacency as we have not had a major event here."
- "This has been many years to get here, and it will take many more to get where we are going. It is a sometimes frustrating process, but I do see continued improvement. I think it will take new thinking and a transformative change to actually implement, though. We won't get there with further incremental steps. Will likely need to completely transform federal animal health agency (CFIA) and build from ground up, integrating PTs and livestock sectors into that governance. Animal health has been weakened federally with move to CFIA under Health Ministry and focus on food safety at CFIA. A new model for animal health is likely needed."
- "The survey is poorly addressing one of the most important nodes of the whole animal health management process that is.... 'Disease Surveillance'. In the swine sector we now have almost fully integrated swine disease surveillance structure with the Canadian Swine Health Intelligence Network (CSHIN) built on the regional components (RAIZO in QC, OAHN in ON and CWSHIN in the western provinces."
- "Encourage this information to be disseminated to a larger audience of livestock producers and practicing veterinarians. Important that these individuals are involved in the new initiative above and that it isn't just the same gov't and industry staff people making up these plans without those on the farms i.e. producers, vets involved in the development and implementation of this new initiative."

Appendix 5: Progression Toward the Ideal Partnership Model

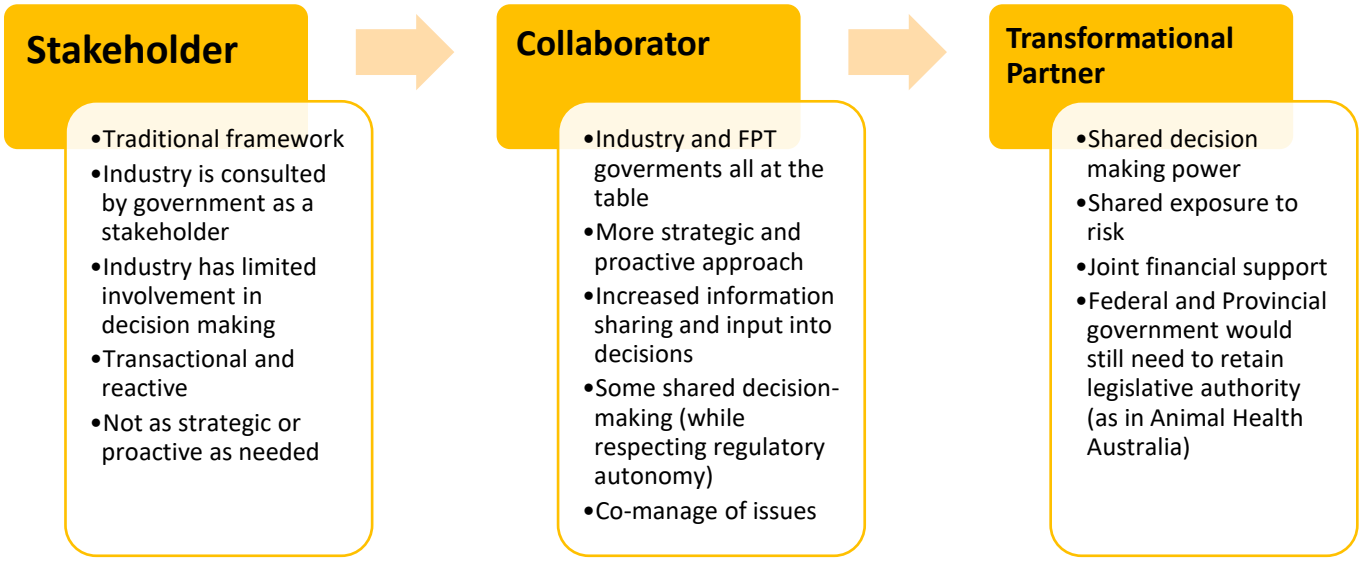
Progression toward the ideal partnership model:

The following are comments and observations on the progression of the working relationship of industry and government can be further developed in the governance assessment project.

What we heard:

- Industry stakeholders want to be more than "just a stakeholder that government consults with"
    - Industry wants to be "at the table" to help make decisions and help in managing situations
    - Industry recognizes that increased levels of input and decisions making also require that industry "step up to the plate"
    - Industry values the compensation model that is currently in place from CFIA under the Health of Animals Act (and is not in a financial position to take on those costs)
- Government officials welcome more industry partnership but also recognize that this is (or will be) a culture shift for the organization. However, government officials also cite the need to maintain regulatory autonomy

Our observation is that the Animal Health Canada concept can move the FPT government and industry to the next level of partnership – to be a "Collaborator" rather than a stakeholder:



Appendix 6: Resource Library

A resource library has been designed as a living, searchable, online database of materials related to prevention, preparedness, response and recovery (PPR&R) from an animal health event. Materials are drawn from a national and international experience. The resource library is password-protected and accessible to members of the NFAHWC.

The database contains key documents (research papers, government and industry documents, summaries, strategies, etc.) of high relevance and importance to planning for an animal disease event in Canada, as identified in our key stakeholder interviews and in our review of existing plans and activities. Its purpose is to provide a repository of easy-to-access information that informs the development of new PPR&R plans across the Canadian animal industries.

The resource library is searchable by document type (prevention, preparedness, response, recovery, other), by species, by disease, and by keywords. Using keywords, the user can drill down to the category of interest such as risk analysis, lessons learned or recommendation for improvements. The database is also expandable such that new documents can be added as they become available, or as they are deemed important to evolving Canada's PPR&R from an animal health event.

Overall, the resource library is designed to be a valuable tool for those involved in developing Canada's PPR&R strategy, containing the most pertinent information needed to inform the process.