ANIMAL WELFARE RESEARCH CAPACITY PROJECT

Final Report to the NFAHW Council

September 18, 2014

NFAHW COUNCIL

This document was prepared by the National Farmed Animal Health and Welfare Council. The Council was formed in 2010 to advise governments and the animal-source food industries on all aspects of the health and welfare of farmed animals in Canada, in support of Canada's *National Farmed Animal Health and Welfare Strategy*. The Council is funded jointly by Canada's animal production sector, the federal government, and provincial-territorial governments. It consists of members drawn principally from government and the animal production sector. Members are appointed because of broad expertise in farmed animal health and welfare and related fields including public health.

The National Farmed Animal Health and Welfare Council would like to thank the project committee for their contributions to the development of this document.

Project Committee

The following people worked on this initiative which was facilitated by Agriculture and Agri-Food Canada (AAFC) and supported by the National Farmed Animal Health and Welfare Council (NFAHWC).

- **François Bédard – AAFC/Market Industry Services Branch – Project Lead**
- **Rob McNabb – Canadian Cattlemen's Association / NFAHWC**
- **David Fraser – University of British Columbia / NFAHWC**
- **Rob Kerr – Chief Veterinary Officer, Nova Scotia - NFAHWC**
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Background

In 2012, the NFAHW Council released an advisory statement "A National Farm Animal Welfare System for Canada (2012)" which included a series of recommendations which also identified potential lead organizations. The full document can be found at: http://www.ahwcouncil.ca/pdfs/animal-welfare-statement/NFAHWC%20animal%20welfare%20vision_cover%20page_2012.pdf

Recommendation #7 in the advisory statement stated: "*That Agriculture and Agri-Food Canada (AAFC) facilitate consultation among sectors on the full range of animal welfare research in Canada with goals of identifying research needs and opportunities (taking international work into account), promoting communication, identifying efficient funding mechanisms, and moving Canada toward a comprehensive and well-targeted program of animal welfare research including relevant social science research.*"

In 2013, the Council expressed concern to AAFC about the termination of researchers in animal welfare within AAFC, as this constituted a significant decline in the country's animal welfare research capacity.

AAFC through the Market and Industry Services and Science and Technology branches agreed to coordinate a project with the Council to assess animal welfare research capacity in Canada. The project committee is pleased to present findings and proposed recommendations for the consideration of the Council.

Moreover, on June 20, 2014, the Standing Senate Committee on Agriculture and Forestry (AGFO) presented a report entitled "*Innovation in Agriculture: The Key to Feeding a Growing Population*". The report was presented to the Senate following the Committee's study on research and innovation efforts in the Canadian agriculture and agri-food sector. The following excerpt from page 34 of the report speaks to the importance of investment in public good and long-term research.

> *"It is important that the government continue its efforts in basic research and invest, by adopting a long-term vision, in priority research areas considered as public good."*

Scope of project

The project deals with the development of a farmed animal welfare research inventory in Canada and the engagement of AAFC and the NFAHWC in facilitating a consultation process for the elaboration of specific recommendations on improving Canada's farmed animal welfare research approach.

- The project used AAFC's research inventory as a tool to outline Canada's farmed animal welfare research capacity.
- Consultations with identified stakeholders (governments, industry, scientists and other relevant groups) were held to identify national and sector specific research gaps, needs and priorities including areas requiring special research efforts.
- Recommendations were developed on identifying approaches/mechanisms for establishing farmed animal welfare research priorities and promoting communication to funders and performers.

Project plan

Research Inventory (Phase 1)

- Collection of information on farmed animal welfare research in Canada
    - Data to include: research performers / areas of research / sector targeted / number of researchers / investment (where possible)
- Collection of information on international research capacity
    - Data to include: prominent international research centers

Consultations (Phase 2) – (see Appendices 1-4)

- List of stakeholders identified for consultations
- Mechanisms to formally engage stakeholders to be identified with the expectation to leverage existing avenues (conference calls, webinars, local and one-on-one meetings).
- Consultations will allow for focused dialogue and feedback for the identification of farmed animal welfare research needs, gaps and approaches to set national and sector specific priorities including resources availability.

Documentation (Phase 3)

- Series of recommendations that identify approaches on how to identify research priorities.
- Series of recommendations that identify methods for communicating research priorities to research performers and funders.

Timeline

- June 2014 – presentation of report and draft recommendations to Council
- July-August 2014 – project committee to consider input and revise report
- September 2014 – Final consideration by Council.
- November 2014 – presentation to stakeholders at Forum 2014.

Status of Workplan

Research Inventory	Completed – • AAFC compilation of animal welfare researchers • International communication and compilation of international research centers • Identification of selected Canadian researchers known to the committee
Consultations	Completed – • Questionnaire to national commodity organizations (through research clusters if appropriate), Canadian Food Inspection Agency (CFIA), Canadian Federation of Humane Societies, Humane Society International - Canada, Canadian Veterinary Medical Association • Survey of Canadian researchers
Documentation	Completed - • Survey and questionnaire summaries completed • Final report with draft recommendations submitted

Research Inventory

AAFC's research inventory was consulted, but had not been designed to separate research on farm animal welfare (defined as research done with the primary goal of improving the care and well-being of farm animals) from other research such as production-oriented nutritional studies and veterinary medicine. However, as an indication of national capacity, eighteen scientists in Canada self-identified as "active in research on farm animal welfare" and responded to the questionnaire. Considering several known scientists who did not respond, the total strength was likely about 25 at the time of the survey, reduced to about 20 with the recent cuts, although a number of other scientists conduct welfare-relevant research on topics such as lameness, disease and building design.

The Animal Welfare Science Hub, funded by the European Union, was consulted on major international capacity and identified ten institutions outside Canada with substantial activity in farm animal welfare research as indicated by a consistent history of publishing in the major scientific journals that deal with farm animal welfare research.

Consultation Findings

Consultation through a survey of industry and non-government agencies and a questionnaire directed at researchers was conducted. The researcher group, identified with the help of Dr. David Fraser, had a primary focus on conducting welfare research.

Key Findings from both groups

- Those commodities with Research Clusters are much more organized and prepared in their thinking on research, research priorities, funding, etc.
- Priorities for animal welfare are largely around managing production practices, disease control, transportation, pain control and assessment. The focus is on addressing immediate needs.
- The codes of practice are identifying research gaps and contributing to prioritization. However, the codes, and hence the identification of research priorities by the code process, are likely to be revised only once every 5-10 years.
- Industry participants know only those animal welfare researchers who are involved in their particular sectors/projects.
- There is recognition that there is need for greater communication between industry and researchers in prioritizing and developing research.
- There is little research activity for “minor” species.
- Industry participants have concerns regarding public understanding of animal welfare and see a need for greater communication.
- A mechanism for enhancing communication among researchers might help build capacity for cross-commodity research.
- Efficiency in existing funding processes can be improved.
- There is a need to explore a mechanism to address long-term needs.
- The current dependency on industry funding may limit long-term or fundamental research that would address future needs.
- There is a need for a process to fund “public good” research, including research in support of public policy.
- Expansion of university researchers has not kept up with decreases at AAFC and as a result, the capacity is widely perceived to be inadequate.
- There are existing challenges associated to the transfer of knowledge and expertise researchers to users.

Recommendations

1. That the NFAHWC:
- identify appropriate roles and priorities for public-sector funding of animal welfare research such as research to support regulatory functions, to support policy, and to meet anticipated future public concerns, and
- communicate with AAFC, CFIA and other relevant agencies to encourage support for such research.

2. That those commodities that do not already take part in research cluster programs identify animal welfare research priorities, recognizing that the identification of research priorities can facilitate access to funding. Research priorities might be identified through an overall research priority process for the organization, through the code development process, or through shared mechanisms with other commodities.

3. That the National Farm Animal Care Council facilitate a process to assist commodity organizations in establishing communication among researchers, research users and research funders in order:
- To promote collaboration and strategic guidance;
- To reduce some of the sources of inefficiency in the funding process;
- To establish a mechanism of engaging and assisting the smaller commodities;
- To identify long-term research needs and opportunities including cross-commodity issues;
- To communicate the importance of farm animal welfare research, to governments, commodity organizations and other research funders;
- To promote understanding of mechanisms for funding farm animal welfare research in Canada; and
- To influence the priorities of agricultural policy frameworks.

The Beef Cattle Research Council, the Canadian Poultry Research Council, and the NSERC Industrial Research Chair focused on the welfare of dairy cattle, provide existing examples of how agencies have cooperated in the funding of research.

4. That commodity organizations undertake research to achieve a greater understanding of the social and economic aspects of farm animal welfare issues, including public and producer attitudes and the economics of using alternative production methods.

Appendix 1 - Industry and other non-government organizations questionnaire (15 respondents)

Current animal welfare research needs/priorities

Participants were asked to list the current and relevant animal welfare research needs/priorities for their sectors or organization that they represent. Each respondent reported a large range of issues, which highlights the importance of animal welfare for the livestock and poultry sectors.

It was noted that the research needs/priorities for the beef, dairy, swine and poultry sectors were developed through their respective science cluster initiatives. Each cluster included consultations with industry and scientific experts to identify research priorities that address a broad range of industry issues. Each of these groups has identified animal welfare as research priority. However, the level of activity and funding dedicated to animal welfare varies from group to group.

Level of research on needs/priorities and gaps that need more research

The sectors that are involved in a research cluster program (dairy, swine, beef and poultry) agreed that this funding mechanism allows the sector to direct a reasonable level of funding to research, including animal welfare research. However, the same was not true of sectors without cluster programs. In addition, all sectors identified topics that are receiving insufficient research attention.

Most respondents noted that the loss of research positions within AAFC could create a potential gap in some ability of some sectors to address research needs. Industry groups felt that they would be responsible to fill the potential gap left by the cuts.

It was noted that industry sectors fund mostly research on short-term or medium-term issues because such research is thought to have the most immediate application to commercial practice. Industry groups generally designate little or no funding for longer-term or more future-oriented projects.

Knowledge of expertise, level of funding, facilities and resources available

Many scientists and research institutions were identified as having the necessary knowledge and expertise to provide animal welfare research. Generally, each sector/ organization identified specific scientists and institutions that provide relevant research for their industry / area of interest.

Most industry groups had a general knowledge of the scientists that focus efforts in their sector but did not have a clear picture of the research capacity in Canada as a whole. The majority of groups noted that the current level of funding does not appear to be sufficient to address current research gaps.

It was suggested that the recent changes within AAFC reduce the country's capacity for animal welfare research, and may also reduce the public credibility of research findings, as the public is likely to be suspicious of research funded by industry. Some noted that the reduction in AAFC research scientists particularly in the area of animal welfare research could impact the ongoing work needed for the successful development the Codes of Practice and on-farm animal care assessment programs.

Areas of animal welfare that require more attention for the livestock industry

Participants were asked to identify aspects of animal welfare that require more research attention for the livestock and poultry industry as a whole. The following are the key areas identified:

- Address animal welfare issues that impact multiple commodities (e.g.: lameness)
- Development of assessment tools for the verification of the implementation of best management practices on-farm
- Assessing fitness for transport
- Understand animal welfare attributes associated with behavioural freedom
- Identification of on-farm behavioural indicators for animal welfare assessment
- The effects of antimicrobial and antibiotic resistance on the welfare of animals
- Cost/benefit analysis on the implementation of animal welfare best management practices programs
- Understand intensive farming and its impact on animal health and welfare
- Analysis on societal expectations and public/consumer preferences
- Practical and effective on-farm pain management options including improving the availability of drugs
- Understand animal welfare and its impact on animal health, the environment and food safety

Other topics beyond animal-based research that would address animal welfare issues

- Consumer and industry attitudes, perceptions and concerns, including purchasing habits, animal welfare labelling impacts and sources of information on modern production practices.
- The development of educational material, training programs and transfer tools to assist producers in making the appropriate changes on-farm.
- Communication efforts directed at educating consumers and the public about agricultural practices being undertaken to address animal welfare challenges - to increase awareness on the various standards and practices that are in place (on-farm and during transport).
- Adequate research to support the development of animal welfare regulatory frameworks
- The effect of animal welfare advocacy organizations on consumer behaviour and on the animal industry

- Sociological studies identifying barriers to the implementation of animal welfare research findings
- Economic analysis of the potential benefits of improved welfare systems

Animal welfare research duplication

Ensuring good communication between funders of animal welfare research was identified as a mechanism that would avoid any potential duplication of efforts among different funding bodies.

The research cluster was identified as a mechanism that seeks to build networks between public and private scientists and institutions to address issues identified by the sectors through a coordinated approach. Such efforts were noted as an effective mechanism to optimize research investments and avoid duplication

Other mechanisms, such as the use of the sector value chain roundtables, the creation of a national supervisory organization or the development of an interactive animal welfare research database/repository were also identified as potential options for communicating research activities to avoid duplication and help identify needs/priorities.

Animal welfare research issues that should be resolved over the next 10 years

The following were identified as the key animal welfare issues or concerns that respondents would like to see resolved in the next 10 years:

- Implementation of improved animal management systems to reduce stress and improve animal health and productivity
- Transportation: improvements of transport vehicles and animal handling practices during loading, transport and unloading, including relevant research to support transport legislation
- Develop knowledge and tools for the effective assessing of animal welfare on farm and during transport
- Addressing animal welfare issues associated with treatment of animals of little monetary value
- Understanding the role of genetics in animal welfare
- Develop practical and effective pain control options for all species including alternative solutions to painful practices (e.g., non-castrated market hogs)
- Develop advancements in alternative housing systems for swine (including environmental enrichment) and poultry
- Improve handling of compromised animals
- Reduce incidence of metabolic diseases and lameness

Scientific capacity and the need for animal welfare research over the last 10-20 years

The majority of participants agreed that the animal welfare scientific capacity (i.e.: number of scientist working predominantly in the field of animal welfare) in Canada has increased over the

last two decades. However, it is unclear whether the increase in scientific capacity has occurred at a rate that meets corresponding research needs. It was also highlighted that the number of scientists has decreased in the swine and poultry industry. It was noted by several participants that the recent animal welfare research cuts within AAFC has reduced the number of available researchers that could be dedicated to basic research in animal welfare. However, it is unclear whether or not these departmental changes will have a big impact on Canada's overall animal welfare research capacity as well as on the sectors' ability to conduct the necessary animal welfare research.

Most participants agreed that the need for animal welfare research has increased over the last 10 and 20 years. It was noted that over the last two decades (particularly in the last 10 years), the farmed animal industry has become increasingly aware of the importance and value of animal welfare. From an industry standpoint, societal expectations, and consumer awareness and expectations associated to animal welfare issues has had the greatest impact on prioritizing greater animal welfare research in the last 20 years.

Approaches for setting animal welfare priorities

The four major livestock and poultry groups identified that existing industry science clusters have been a successful mechanisms for the identification of research priorities. Each research cluster has identified animal welfare as a priority in their research programs. However, collaboration is needed between researchers and funders of animal welfare research, and between industry groups, in any approach that attempts to set research priorities.

There is currently no structure in place to adequately address any cross-commodity animal welfare issues. It was suggested that this might be undertaken by the National Farm Animal Care Council (NFACC), NFAHWC or a new cross-sectoral group.

NFACC was identified by a few participants as being a group that could play such a coordinating role. NFACC's direct link to the various commodity groups through the codes of practice and their experience in conducting consultations could support sectors in promoting collaboration. NFACC could also help coordinate activities for minor species sectors that have limited financial and human resources.

Communication towards a targeted research program

Ensuring that animal welfare research priorities are communicated to scientists is a key component to achieve a targeted research program. Existing industry lead research clusters, for the most part, have clearly defined research strategies and expected outcomes, which have been identified by the participating sectors as a successful mechanism to reach out to the scientific community. For sector groups that do not have research cluster programs, there is no established group responsible for developing research priorities and communicating them to the broader scientific community. The underlying message from most participants suggests that communication of research priorities must be done by groups funding research.

Several participants noted that funders, whether governments or industry, have a role to play in the broad dissemination of research needs and priorities. Greater communication between funding groups and to the scientific community could reduce any potential duplication and help ensure research funding program objectives are being met. It was noted that clearly defined research goals and on-going evaluation of research projects (during the initiation, development and completion) would help inform the priority setting processes and identify if new strategies need to be developed.

Considering that industry sectors are being asked to fund more research, their research program should include targeted communication activities. Multi-stakeholder committees, partnerships or coordination through existing roundtables and funding agencies are opportunities for sectors to target common communication efforts. However, the onus is increasingly on the commodity groups to ensure that their research priorities are widely communicated in an effort to direct and influence research activities.

Appendix 2 - Researcher Survey (18 respondents)

Communication with research users

The scientists reported a high level of communication with producers, sector leaders and other users of their research. Formal methods of communication included (1) scientists participating directly in industry advisory committees, regional and national research committees, and NFACC-sponsored committees including those involved in codes of practice, (2) consulting published industry priorities, (3) seeking letters of support for applications, and (4) submitting letters of intent before making formal proposals. Informal methods included personal contacts, especially when attending or speaking at industry meetings, receiving direct requests for advice from producers, holding open-house events for producers at research facilities, and speaking to producers during on-farm research trials. Scientists also reported substantial engagement in industry outreach and extension, averaging 20% of total work time for university scientists and 12% for government scientists.

Changes in research needs and capacity

The scientists perceived that the need for animal welfare research had increased greatly over the past 10 and 20 years, and there was a clear perception that the research capacity is insufficient for the needs. One participant felt that a "tipping point" had been reached some years ago when demand outstripped capacity. Another said that "funding for people, projects and facilities are not keeping up with demand." Another noted that with too few scientists trained in animal welfare, some industry-funded projects in animal welfare are being done by researchers who lack the necessary training.

The questionnaire did not mention cuts to animal welfare research by AAFC (initially in the 1990s and subsequently in 2013-14) but these emerged as a recurring theme in the responses from university-based scientists.

Time spent on research and other activities

"Time spent on research" (including supervision of student research, applying for research grants and meeting the reporting requirements of research grants, but excluding teaching and extension) averaged 76% of total work time for the 5 government scientists and 46% for the 11 university scientists who responded. Applying these figures to the roughly 20 scientists currently active, the total professional strength is roughly 12 person-years of time spent on research.

However, within "time spent on research" scientists reported spending a high but variable amount of time (between 10% and 90% depending on the scientist) applying for and administering research grants. Excluding the time spend on applying for and administering grants, time spent on the actual conduct of research was calculated to be about 50% of total work time for government scientists, and about 30% of total work time for university scientists.

Factors that determine research projects and that constrain research achievement

Participants overwhelmingly cited (1) availability of funding and (2) awareness of current industry problems as the leading factors.

Inefficiencies caused by the funding system

Many scientists commented on problems caused by cumbersome and inefficient processes for funding animal welfare research in Canada. Problems included (1) the need to go to multiple funders to raise sufficient funds for a single project, (2) the duplication among funding bodies, (3) lack of coordination between funders, the application process and in the priorities identified, and (4) a growing requirement for reporting back to funding bodies.

Some participants noted a mis-match between the rules of funding bodies and the rules of universities on matters such as over-expenditure. This incompatibility makes it difficult to conduct university research using certain funds from government or industry.

Limitations of research caused by the funding system

Many participants noted that most research funding for farm animal welfare requires industry support, either in the form of industry research grants or government grants that require industry matching funds. In addition, some other public money requires industry participation; for example, AAFC's Canadian Agricultural Adaptation Program requires that applications are submitted, and funds administered, by industry organizations. This industry-driven funding system was seen as limiting the national research effort in several ways:

- The requirement for industry sponsorship was seen as skewing research effort toward short-term problems.
- Industry control was seen as potentially preventing certain types of research such as research on controversial practices or basic ("discovery") research.
- For research on controversial practices, the credibility of the research to the public may be limited if the work is done or funded by industry. In this respect, some animal welfare research needs to be seen as public-good research rather than industrial-benefit research, and requires public funding.
- Research needed for policy development, for monitoring and surveillance of animal welfare, and to support government regulatory functions such as humane transport may be limited. Whereas industry has now taken on a role in commissioning and funding research, the CFIA and other regulators do not seem to be part of the animal welfare research system.

Risk of duplication

The scientists were emphatic and virtually unanimous in insisting that duplication is not a problem in animal welfare research in Canada. Many participants noted that major findings need to be verified under a range of conditions before being incorporated into Best Management Practices and Codes of Practice. Scientists generally felt that the level of such replication is generally insufficient because of the limited research capacity.

Other comments

- A national forum could be developed for setting and discussing cross-sector research priorities
- There is a need for more university positions in farm animal welfare.
- Adequate funding is needed to ensure scientist development for the future
- Research may be lacking in the following areas: (1) the role of genetics in animal welfare, (2) social and economic research such as public attitudes and the economics of alternative production practices, and (3) production practices that are potentially valuable (e.g., cage-free eggs) but not widely used in the industry.

Appendix 3 – Questionnaire for industry and non-government stakeholders

Animal Welfare Research Capacity – Questionnaire
Universities, governments and private companies conduct farm animal welfare research on a variety of animal species. However, more coordination is needed to prioritize farm animal welfare research needs that improve Canada's ability to create a well-targeted farm animal welfare research platform. An ideal farm animal welfare research platform is one that supports standards, animal management practices, communication materials and compliance-assurance activities.

The purpose of this questionnaire is to obtain feedback from key stakeholder groups (i.e.: users of animal welfare research), on farmed animal welfare research needs, gaps and approaches. Information gained through this questionnaire will be communicated to the various sectors that set national research priorities.
Stakeholder questions:

1. For your sector or organization, what are the current animal welfare research needs/priorities?

2. Are these needs/priorities receiving a satisfactory level of research by scientists? If not, what are the gaps that need more research?

3. Which scientists do you use, or could be used, to provide animal welfare research relevant to your sector/organization?

4. If you are aware of the level of funding, facilities and other resources available to the scientists, do you feel these are adequate to address the gaps identified?

5. Beyond your sector or organization, are there aspects of animal welfare that require more research attention for the livestock industry in general?

6. Beyond animal-based research, are there other topics (e.g.: consumer behaviour, effectiveness of regulations, economic analysis of housing systems) that would help address animal welfare issues?

7. Are there areas of animal welfare research that are currently being duplicated? If so, what mechanisms can be undertaken to avoid such duplication?

8. Thinking ahead 10 years, what animal welfare issues or concerns would you like to see solved by that time?

9. Do you feel that the need for animal welfare research has increased, decreased or remained stable in the past 10 years (since 2004), and in the past 20 years (since 1994)? Do you feel that the scientific capacity for animal welfare research in Canada (scientists, support, facilities) has increased, decreased or remained stable in the past 10 years (since 2004), and in the past 20 years (since 1994)?

10. What is the best approach(es) for setting animal welfare research priorities both for your sector and from a cross-commodity perspective? Are there specific organizations or groups that can be tasked with coordinating and identifying animal welfare research priorities?

11. How could animal welfare research priorities best be communicated to scientists in order to achieve a targeted research program?

Appendix 4 – Questionnaire for researchers

NFAHWC Farm Animal Welfare Research Capacity Study

Here are 10 questions, but in addition please make any comments on what you feel is needed to move Canada toward a comprehensive and well-targeted program of farm animal welfare research. Comments might relate to the level of national coordination and communication, under-researched topics, or barriers to progress. Under "farm animal welfare research" please consider work in the biological sciences and also in the social sciences such as research on public attitudes and economic analysis of alternative housing systems.

1. Would you describe research on farm animal welfare (including social science research) as the main focus, or alternatively a major focus, of your work? (All the remaining questions are intended for those who self-identify this way.)

   If yes, is your current position mostly:
   - university
   - government
   - industry
   - other

   Deciding research topics

2. What mostly determines which research projects you undertake? Please rate the following as very important, somewhat important, or not important, and make any other relevant comments:
   - specific requests from industry
   - your awareness of current industry problems
   - foreseeing future industry problems
   - working to replace practices that may raise animal welfare criticism
   - availability of funding
   - availability of facilities
   - the focus of your institution or colleagues
   - personal interest
   - other

3. Could you describe any significant communication you have with producers or organizations whereby you learn about their research needs/priorities?
   - formal communication processes?
   - Informal communication processes?

4. Could you describe any process you use to seek or receive feedback from producers or organizations about the suitability of your proposed research?

Constraints

5. What limits your ability to accomplish research? Please rate the following as very important, somewhat important, or not important, and make any other relevant comments:
   - constraints on your own time
   - funding
   - facilities
   - availability of technical or graduate student support
   - other factors

6. Of your total work time, about what percent is spent in research?
   (In research, include applying for and administering research grants, and supervising graduate student research, but don't include teaching courses, extension and service.)

7. About what percentage of your total research time (as defined in the question above) is spent applying for and administering research grants?

8. About what percentage of your total work time do you spend in extension and service to users of the research?
   (In extension and service please include educational activities with users and committee work with user organizations, but not service to your institution.)

Time trends

9. Responding based on how many years you have been involved,
   A) do you feel that the need for animal welfare research has increased greatly, increased somewhat, decreased greatly, decreased somewhat, or remained about the same:
      i. in the past 10 years (since 2004)
      ii. in the past 20 years (since 1994)
   B) do you feel that the scientific capacity for animal welfare research in Canada (scientists, support, facilities) has increased greatly, increased somewhat, decreased greatly, decreased somewhat, or remained about the same:
      i. in the past 10 years (since 2004)
      ii. in the past 20 years (since 1994)

Duplication

10. Research funders often express concern about duplication of effort. Are you aware of any cases where different scientists in Canada have duplicated each other's research in animal welfare?

    Do you feel you are sufficiently aware of other scientists in Canada doing research similar to yours that duplication is very unlikely?

Other comments

Please make any other comments on what you feel is needed to move Canada toward a comprehensive and well-targeted program of farm animal welfare research.