



CANADIAN
CATTLEMEN'S
ASSOCIATION

National Voice Of Cattle Producers

Beef Industry Strategies for Reducing Greenhouse Gases

Prepared by the Canadian Cattlemen's Association

Updated February 2019

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Executive Summary

Federal and provincial governments continue to progress the discussion on climate change across Canada. Notably, the Senate of Canada recently released the report: Feast or Famine: Impacts of climate change and carbon pricing on agriculture, agri-food and forestry (Dec 2018) containing 15 key recommendations. The focus on climate change relates to Canada's commitment to reducing Greenhouse Gas (GHG) emissions to 17% below 2005 levels by 2020 and 30% below 2005 levels by 2030. The Canadian beef industry continually strives to be a global leader in sustainable beef production and looks to be a partner in dually achieving Canada's economic and environmental targets. Due to continual improvements, innovation and commitment of Canadian beef producers, Canadian beef has one of the lowest GHG footprints per unit of production in the world at 11.4 kg CO₂ equivalent per kilogram of live weight, less than half of the world average. Furthermore, substantial amounts of carbon are stored in Canadian rangelands utilized by the beef industry. While contributing \$33 billion to the Canadian economy the beef industry attributes only [2.4% of the country's total GHG footprint](#).

Through responsible stewardship of Canada's natural resources, the Canadian beef industry will continue to contribute to the growth of the green economy in Canada. The ability to do so will be contingent on successful adaptation and resiliency to climate change, as farmers are often the first impacted by severe weather conditions. Recommendations for investment to enable adaptation, build resiliency and reduce the GHG footprint of beef production while enabling economic growth of the industry are summarized below. Further detail and context can be found in the merged full report. The recommendations are organized into main categories – increasing productivity, enhancing resiliency, mitigating emissions, supporting national and international climate change dialogue and scientific measuring and monitoring.

CCA Recommendations to Reduce the GHG Footprint of Canadian Beef Production

Increasing Productivity

- further invest in research programming through the **Beef Cattle Research Council (BCRC)** and other research funding organizations that support research, innovation and knowledge transfer regarding practices that support improvements in productivity and reduce the environmental footprint of beef production.
- maintain and restore critical **University-based** and **Agriculture and Agri-Food Canada (AAFC) research capacity and infrastructure** to ensure ongoing delivery of research programming aligned with industry priorities.

Enhancing Producer Resiliency

- develop **clear triggers** and reference materials for the **AgriRecovery** program.
- improve **hay and forage insurance** across the country by implementing the recommendations made by the Federal Provincial/Territorial Forage Task Team.
- invest in **agriculture water management infrastructure**; examples may include supporting the construction of improved irrigation systems and flood structures such as dams/storages or outlets.

- align with a key recommendation in Senate Canada's December 2018 '[Feast or Famine](#)' report to support the creation and further development of **payment for ecosystem services (PES) programs** that will provide incentives for best land and water management practices to conserve critical agricultural land, improve environmental health, and build resiliency into the agriculture sector.

Mitigating GHG Emissions

- invest in research focused on **forage quality, feed additives**, animal **genetics** and animal **health** as outlined by the BCRC Research Strategy.
- invest in research to better understand **food waste** causes in Canada and enhance communication efforts to reduce food waste at the consumer level.
- develop and support agriculture focused **conservation and stewardship** programs and initiatives that support the conservation of healthy rangelands and riparian areas.

Supporting National and International Climate Change Dialogue and Action

- support the **Canadian Roundtable for Sustainable Beef (CRSB)** through AAFC and Environment and Climate Change Canada staff participation and project funding.
- support and engagement in the **Global Research Alliance on Agricultural Greenhouse Gases** and the **Global Agenda Towards Sustainable Livestock**.

Scientific Measuring and Monitoring

- support the scientific measuring and monitoring of the GHG footprint of Canadian beef production through continued investment in the **Farm Environmental Management Survey**, the **Census of Agriculture** and the enhancement of existing and emerging precision measurement technologies to ensure robust data sets that enable GHG monitoring.
- support the development of global GHG monitoring methodologies through the **Livestock Environmental Assessment Partnership** (LEAP) program by offering the participation of AAFC research scientists as technical advisors as well as financial contributions.

Fast Facts Regarding Beef Production and Climate Change

- The Canadian beef industry's total GHG production is 23.38 megatonnes (Mt), accounting for [2.4% of the country's total GHG footprint](#). Canada's total agriculture GHG production is 60 Mt, accounting for 8% of Canada's total GHG footprint.
- Canadian beef has one of the lowest GHG footprints per unit of production in the world at 11.4 kg CO₂ equivalent per kilogram of live weight, less than half of the world average.
- The GHG footprint of the beef industry is due mainly to the production of methane (over 70%); methane is a comparatively short-lived GHG and a natural by-product of feed digestion in the intestinal tract of ruminants such as cattle and bison.
- If valued at \$15 CAD per tonne, carbon stored in prairie grasslands alone would be valued at \$4.3 billion CAD and over \$11 billion CAD has been lost in the Parkland region due to grassland conversion to cropland as well as industrial and urban development.
- It is estimated that GHG emissions could be cut by up to 20% through uptake of mitigation strategies and another 5% could be cut from reducing food waste by half.
- Between 1981 and 2011, the Canadian beef industry reduced [its GHG footprint by 14%](#) through advancements in technology and management that enabled industry to produce the same amount of beef in 2011 compared to 1981, all with 29% less breeding stock, 27% fewer slaughter cattle, and 24% less land.
- Canadian beef industry produces ~2% of the world's beef and contributes an estimated \$33 billion CAN to the Canadian economy.
- Beef production in Canada utilizes 21 million hectares of agriculture land of which [93% is pasture and forage land](#).
- Canadian grasslands, preserved through the efforts of ranchers, can store up to 200 tonnes of carbon per hectare. The cultivation of grasslands can lead to 30 - 35% loss of soil organic carbon. (Bork 2013)

Beef Industry Strategies for Reducing Greenhouse Gases

The Canadian beef industry continually strives to be a global leader in sustainable beef production. Through targeted efforts and the provision of government and industry investment in sustainable farming practices that are resilient to climate change, the Canadian beef sector will be able to achieve success in both reducing its greenhouse gas footprint and building the green economy. The reduction of greenhouse gas emissions and optimization of carbon sequestration in grasslands will be achieved through strategically increasing productivity, enhancing resiliency, and mitigating emissions.

Background

Finding ways to grow more food without increasing greenhouse gas (GHG) emissions is a challenge farmers face around the globe. GHG emissions represent a loss of costly inputs, both nutrients and feed energy, ultimately resulting in inefficiencies in agricultural production systems. Farmers and ranchers are also the ones inevitably faced with adapting to the weather, often witnessing first-hand the true impacts of climate change.

Through the provision of government and industry support for sustainable farming practices that are resilient to climate change, the Canadian beef sector can successfully reduce its GHG footprint, while providing food for the world's growing population.

Canada's total agriculture GHG production is 60 Mt, accounting for 8% of Canada's total GHG footprint. The Canadian beef industry's total GHG production is 23.38 MT, accounting for 2.4 % of Canada's total, including meat from dairy animals and manure (Environment and Climate Change Canada, 2016 & 2018). Canadian beef has one of the lowest GHG footprints per unit of production in the world at 11.4 kg CO₂ equivalent per kilogram of live weight, less than half of the world average (Legesse, 2015; Gerber et al, 2013). The GHG footprint in the beef industry is dominated by methane, representing 73% of the total footprint (Legesse, 2015). Methane is primarily produced through enteric fermentation – a process that occurs when any ruminant (e.g. cattle, deer, elk, sheep, etc.) digests feed. The remainder is produced from nitrous oxide from manure and crop fertilizer's nitrogen volatilization, and from carbon dioxide due to fossil fuel consumption.

The Canadian beef industry also conserves rangelands, which store significant amounts of carbon. To understand the full value of conserving grasslands and the GHG footprint of the Canadian beef industry, one must appreciate the amount of carbon sequestered in grasslands. Dr. Edward Bork at the University of Alberta notes that if valued at \$15 CAD per tonne, carbon stored in prairie grasslands alone would be valued at \$4.3 billion CAD and that over \$11 billion CAD has been lost in the Parkland region in Canada due to conversion to cropland, industrial and urban development. Importantly, once grasslands are converted to another use, they are unable to fully recover their carbon stores, even if re-vegetated in the future.

The Canadian beef industry is a global leader in mitigating the GHG footprint of beef production. However, further opportunities for reduction remain through continued innovation, research, and information sharing (Pogue S et. al. 2018). The Food and Agriculture Organization (FAO) of the United

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Nations report, Tackling Climate Change Through Livestock, estimates that if all livestock producers achieved the production efficiency of the top 10 or 25% of producers, total emissions could be reduced by 18 to 30% (Gerber et al, 2013). This estimation is supported by Canadian-specific research, which has shown emissions could be cut by 20% through mitigation strategies and another 5% could be cut from reducing food waste by cutting food waste in half (Beauchemin et al 2011; CRSB).

The definition of Climate Smart Agriculture (CSA) is “...agriculture that sustainably increases productivity, enhances resilience (adaptation), reduces/removes GHGs (mitigation) where possible, and enhances achievement of national food security and development goals” (FAO, 2016). The Canadian Cattlemen’s Association (CCA) recommends utilizing the framework for CSA to guide the GHG reduction strategies in Canada’s beef industry. Industry and government alike should focus on sustainably increasing productivity, enhancing resiliency, and mitigating GHGs where possible. Potential actions and opportunities are outlined below.

Sustainably Increasing Productivity

Reductions in the beef industry’s environmental footprint have largely come through technologies that improve production efficiencies. A key pathway for CSA success is to find ways for sustainable intensification that offer multiple-win solutions in economic, climate, environmental, and social aspects of animal production. Between 1981 and 2011, the Canadian beef industry reduced its GHG footprint by 14% through advancements in technology and management that enabled industry to produce the same amount of beef in 2011 compared to 1981, all with 29% less breeding stock, 27% fewer slaughter cattle, and 24% less land (Legesse et al, 2015). Future improvements in feed resources, nutritious diet supplements, improvement of animal health technologies, and manure management will enable further reductions (Pogue S et. al 2018). **Supporting research and the subsequent extension to producers regarding best management practices is the key to further increasing productivity.**

The Canadian beef industry recommends the continuation of and further investment in research through the Beef Science Cluster program and other industry and government funding programs with a focus on advancing productivity gains with positive outcomes related to reducing our GHG footprint. The Beef Science Cluster, as an example, invests in a broad spectrum of research topics enabling the advancement of sustainable production efficiencies for the industry. It is crucial to maintain and grow the research and innovation program through the Canadian Agricultural Policy frameworks: ensuring the renewal of Science Clusters occurs in a seamless and timely manner.

Beyond the Science Cluster program, a key priority is to ensure critical Canadian agricultural research capacity and infrastructure provided through AAFC and universities is maintained. A significant number of senior researchers and technical staff are set to retire over the next three to five years. There must be appropriate transition planning and training of new researchers so that essential research programs are not negatively impacted. Likewise, remaining AAFC beef and forage research infrastructure needs to be maintained, and in some cases modernized, to ensure researchers have access to relevant technologies and facilities as required in order to address key research priorities in a timely and reliable manner.

CCA Recommend Direction – Sustainably Increasing Productivity

- further invest in the **Beef Science Cluster** programs that support research, innovation and knowledge transfer regarding practices that reduce the environmental footprint of beef production
- maintain and restore critical **AAFC research and infrastructure capacity**

Enhancing Resiliency

Resilient is a term often used to describe Canada's beef farmers and ranchers. Market shocks, such as the Bovine Spongiform Encephalopathy (BSE) crisis of 2003 and severe weather such as droughts and floods, have had rippling impacts on the sector with negative impacts on our ability to reduce and mitigate our GHG footprint. Despite these severe historic impacts, the Canadian beef industry continues to thrive producing, ~2% of the world's beef and contributing an estimated \$33 billion CAN to the Canadian economy (Kulshreshtha et al, 2012).

Further adaption and resiliency building to market, weather, and other impacts is key to building an industry resilient and responsive to climate change. **The CCA recommends building resiliency in the Canadian beef industry through advancing the protection of ecosystem services through ecosystem service programs, developing and maintaining disaster and forage insurance programs, and through further investment and development in infrastructure.**

Ecosystem Service Programs

Healthy ecosystems are of the utmost importance to building climate change resilient communities across Canada. Healthy ecosystems protect against drought, flood, and other severe weather impacts occurring more frequently in today's changing climate. Canadian agriculture covers 64.8 million hectares across the nation; beef production utilizes 21 million hectares of which 93% is pasture and forage land (CRSB, 2016) providing high quality habitat and support biodiversity. Continually advancing the understanding of and support for the ecosystem services delivered on this landscape will have positive impacts that resonate for all Canadians. Senate Canada, in the December 2018 '[Feast or Famine](#)' Report, recognized the importance of incentives in a key recommendation stating: "That Agriculture and Agri-Food Canada, Environment and Climate Change Canada and Natural Resources Canada work with their provincial and territorial counterparts to ensure that there are incentives available across Canada for beneficial management practices."

Payment for Ecological Services (PES) programs are a fee-for-service arrangement that pays for public goods otherwise under-delivered or not delivered in the market place. Some examples of ecological services being delivered on private lands include:

- expanded riparian buffer zones that provide critical wildlife habitat and improve water quality,
- creating, restoring or maintaining wetlands, which improve water quality and protect against flooding,
- managing native prairie to enhance critical habitat for Species at Risk,

- establishing pollinator hedgerows to provide habitat for pollinators, and,
- replanting grasslands to sequester carbon.

PES programs offer payments to farmers or landowners in exchange for managing their land to provide some sort of ecological service, often called a fee-for-service. This system incentivizes the provision of environmental services through conditional payments to voluntary providers. Programs such as these promote the conservation of natural resources in the market place. This can lead to tangible economic benefits to stakeholders through cost avoidance. For example, in New York State, where it was possible to avoid building a \$6-billion-dollar water treatment plant with \$250 million/year upkeep costs by paying for the delivery of ecological services from the land upstream (for a fraction of the cost).

We encourage the federal government to **support, through public and private resource mobilization, the creation and further development of PES programs enabling cost effective improvements to the environmental health of Canada’s landscape and the building of resiliency into the agriculture sector. These programs will be most successful if they are incentive-based, community delivered, and voluntary.**

Disaster Response Programs and Forage Insurance

As climates change, the risk of severe weather events also increases. Droughts, floods, and other severe weather events significantly impact the economic and environmental performance of the agriculture industry. As these weather risks increase, it is imperative to have tools available to producers to help manage risk during these trying times.

CCA believes there needs to be sufficiently funded national agriculture risk management programs delivered consistently across all jurisdictions that do not create a competitive imbalance between agriculture sectors or regions.

Since the discovery of BSE, the CCA has been lobbying for a true disaster response program. AgriRecovery has been delivered in several areas in Canada, however room for improvement of this program remains, including the creation of clear triggers and reference materials regarding what the program will and will not cover. Historically, the dependence of this program on political decision making during the disaster has compounded confusion in challenging times and made planning for disasters enigmatic for the producer community. Canadian producers need not be put in situations where they are waiting to do what is best for their operations because activity that predates an announcement may be deemed ineligible for reimbursement.

While the CCA understands the benefits that an ad-hoc national blanket framework provides, government should consider the unique types of risk each agricultural sector of Canada must manage. For the beef industry, improved hay and forage insurance across the country that includes a “feed needs replacement” component could potentially replace some of the calls for an AgriRecovery response to weather events. The CCA encourages both federal and provincial governments to continue working towards implementing Agri-Insurance recommendations made by the Federal Provincial/Territorial Forage Task Team.

Infrastructure Investment

Increased investment into infrastructure is another proactive approach to provide long term disaster mitigation. The Canadian beef industry supports the construction of improved water management infrastructure to mitigate disaster events caused by too much or not enough water. Constructing improved irrigation systems and flood structures such as dams, storages or outlets are examples of worthwhile projects. A national dialogue regarding the effective management of water resources, both during times of excess or short supply, may be required.

Due to a lack of infrastructure, beef producers in Manitoba have been repeatedly challenged by flooding in the past. The Canadian beef industry supports commitments made by federal and provincial governments to the long-needed Lake Manitoba and Lake St. Martin Outlet Channels Project. The Canadian beef industry requires ongoing investments in long-term water management strategies, as well as sound regulatory policies around stock watering, irrigation, and man-made reservoir infrastructures. CCA believes that investment in water management infrastructure will enable agriculture lands in Canada to operate more predictably and become more resilient to the effects of climate change.

Summary – Enhancing Resiliency

- develop **clear triggers** and reference materials for **AgriRecovery**
- improve **hay and forage insurance** across the country by implementing the recommendations made by the Federal Provincial/Territorial Forage Task Team
- invest in **agriculture water management infrastructure** and support a **regulatory framework** for low risk water development and **exemptions** where appropriate related to fisheries regulations
- support the creation and further development of **payment for ecosystem services (PES) programs** that will provide incentives for best land and water management practices to preserve critical agricultural land, improve environmental health, and build resiliency into the agriculture sector

Mitigating Greenhouse Gas Emissions

GHG emissions in beef production represent a loss of valuable inputs such as nitrogen, organic matter, and energy. With limited and costly inputs, the beef industry has both economic and environmental drivers to reduce our GHG footprint. Increasing the overall productivity and efficiency of farm systems, and recovering energy and nutrients, are key strategies to reduce the emissions intensity of livestock production. The GHG intensity of beef production in 2011 (11.4 kg CO₂e/kg live weight) was 14% lower than that in 1981 (14 kg CO₂e/kg live weight). Increases in reproductive efficiency, average daily gain, slaughter weight, and crop yields were among the factors contributing to the decrease in emission intensity over time (Legesse et al, 2015). Continued improvements in reducing the GHG footprint of beef production can be made through strategic and continued focus in key areas (Pogue S et. al 2018). Although Canadian beef production is already highly efficient, emissions of GHG could be further reduced by up to 20% if multiple strategies were used across the primary production sector

(Beauchemin et al, 2011). Closing the gap between high and low emitters within the Canadian production system will have meaningful impact.

Key categories:

1. Improving feed quality and digestibility
2. Improving animal health and genetics
3. Reducing food waste
4. Enhancing Agriculture Conservation & Stewardship

Research Investment To Encourage Adoption Of Best Practices To Advance The Mitigation of Greenhouse Gases In Beef Production in Canada.

[Improving feed quality and digestibility](#)

Feeding low-quality and low-digestibility feeds (such as grass and hay) result in higher enteric emissions in beef production versus higher quality feeds (such as barley and corn). The main proportion of GHG emissions from the Canadian beef system come from the cow-calf sector of the industry, as enteric emissions are heightened due to the consumption of lower quality feeds in this stage. Reducing the amount of nutrients excreted in manure will also contribute to reduced GHG production by manure. Improvements in feed quality, digestibility, and better matching protein supply to animal requirements will have meaningful impacts on reducing the GHG footprint of the beef industry (Reducing Greenhouse Gas Emissions from Livestock: Best Practice and Emerging Options, 2013; Pogue S et. al 2018).

[Improving animal health and genetics](#)

Increasing animal health and cultivating genetics can extend the productive life of animals, improve reproduction rates, increase productivity, reduce mortality rates, reduce the age of first reproduction, and reduce the prevalence of common diseases. These improvements reduce the number of animals kept for maintenance rather than production and, subsequently, condense the GHG intensity of beef production in Canada.

[Reducing food waste](#)

The [FAO reported in 2016](#) that one-third of all food produced for human consumption in the world is lost or wasted each year for various reasons. Food is lost or wasted throughout the supply chain, from initial agricultural production down to final household consumption. Approximately 19% of edible bone free meat is wasted throughout these stages. **Food loss** refers to the decrease in edible food mass at the early stages of the food chain, such as production and postharvest handling. Food loss occurs primarily in developing countries. Meanwhile, **food waste** refers to the discard of foodstuff at the retail and consumption levels, and is more commonly observed in high-income countries.

When considering the full life cycle of Canadian beef meat production, meat waste is one major source of the impact of the downstream stages (i.e. from processing down to the consumer level). In Canada,

it is estimated that for every 1.24 kg of bone-free meat that leaves the packers, only 1 kg is consumed (CRSB, 2016).

The total GHG footprint of the Canadian beef industry could be reduced by 5% by cutting food waste in half. Efforts should be made to better understand the Canadian context of food waste and steps taken to prevent losses.

Agri-Environmental Conservation and Stewardship

Research and demonstration uphold that well run cattle operations play a large role in maintaining healthy rangelands, which provide a wealth of ecosystem services to society. These can include promoting biodiversity, wildlife habitat (including for Species at Risk), water filtration, nutrient recycling, and substantial carbon sequestration. Across the nation there are a number of existing programs delivering education and capacity building based programming for beef producers further enabling the delivery of multiple services from the landscape. The continued and enhanced funding for programs working in harmony with producers to boost and support the understanding and uptake of beneficial management practices will benefit all society. Research shows maintaining the quality and health of rangeland ecosystems calls for a disturbance such as fire or grazing. The most economically viable way to replicate these natural disturbances is with the help of ranchers and their cattle. The CCA encourages the continued and increased funding of agriculturally focused conservation and stewardship programs encouraging environmentally orientated actions on agricultural operations that benefit all society. The Federal Government has financially supported agri-environmental programs such as the Environmental Farm Plans, Verified Beef Production Plus, Cows and Fish, MultiSAR, Farmland-Riparian Interface Program (FRISP) and others through agriculture and conservation funding.

Summary – Mitigating GHG Emissions

- invest in research regarding **forage quality, feed additives**, animal **genetics** and animal **health** as outlined by the BCRC Research Strategy
- Invest in research to better understand **food waste** causes in Canada and enhance communication efforts to reduce food waste at the consumer level
- develop and support agriculture focused **conservation and stewardship** programs and initiatives that support the conservation of healthy rangelands and riparian areas and continued use by the beef industry

Support National and International Climate Change Dialogue and Action

The Canadian beef industry has taken leadership roles in the Global Roundtable for Sustainable Beef (GRSB) as well as through the development of the Canadian Roundtable for Sustainable Beef (CRSB). These multi-stakeholder organizations are focused on advancing and communicating the sustainability of beef production in Canada and abroad. This multi stakeholder approach enables collaboration and the fundamental strengthening of the green economy in Canada. The CCA encourages support for the CRSB through AAFC and Environment and Climate Change Canada staff participating and project funding.

Globally speaking, an estimated 1 billion people living below the poverty line around the world derive at least part of their livelihood from livestock, and although efficiencies in developing agriculture systems may be lacking, the opportunity for improvement is significant. Ten times more women own livestock rather than land and a growing body of evidence suggests increasing women's control over assets, including livestock, has positive effects on food security, child nutrition, education, and women's wellbeing, as well as climate change.

As a global community, we must work together to continue to support the development of sustainable agriculture production systems in all regions. By addressing the gap between producers and production systems with the highest emission intensity and the lowest emission intensity, meaningful reductions are possible. Information sharing, problem solving, and innovation across national borders are key to reducing the GHG footprint of livestock globally. We encourage the federal government to continue to support international initiatives addressing this gap in GHG emission intensity, such as the Global Research Alliance on Agricultural Greenhouse Gases, the Livestock Environmental Assessment Performance (LEAP) Partnership and the Global Agenda Towards Sustainable Livestock.

Summary – Support National and International Climate Change Dialogue and Actions

- support the **Canadian Roundtable for Sustainable Beef** through Agriculture and Agri-Food Canada and Environment and Climate Change Canada staff participation and project funding
- support and engagement in the **Global Research Alliance on Agricultural Greenhouses Gases** and the **Global Agenda Towards Sustainable Livestock**

Scientific Measuring and Monitoring

Data collection and methodology development are key pillars to measuring and understanding the GHG footprint of beef production in Canada. Data gathered from the Farm Environmental Management Survey and the Census of Agriculture are fundamental to the industry's ability to measure and monitor our GHG footprint. Continuation of data collection through these data collections is imperative. A global effort has been undertaken by the FAO and committed stakeholders to develop consistent methodologies for measuring the environmental footprint of beef production. This undertaking, the Livestock Environmental Assessment Partnership (LEAP), is critical to facilitating information sharing, problem solving and innovation across national borders. Canada's participation is key to advancing the sustainability of livestock globally as well as to positioning Canada as a world leader in sustainable agriculture production.

The Canadian beef industry has already benefitted from LEAP's early work through using the methodologies to undertake our domestic benchmarking exercise. This work will be used to communicate the current state of the sustainability of the Canadian beef industry, as well as to guide future targeted initiatives. It is imperative to utilize world recognized methodologies to enable comparisons, enhance transparency and undertake robust analysis.

Consequently, it is important that LEAP emerge as the pre-eminent global environmental assessment methodology. We recommend that the Canadian government support the LEAP work program by

offering the participation of AAFC research scientists as technical advisors. Such participation will enhance the credibility of the LEAP results. Financial contribution to the project would also be beneficial.

Summary – Scientific Measuring and Monitoring

- support the scientific measuring and monitoring of the GHG footprint in Canadian beef production through the investment in the **Farm Environmental Management Survey** and the Census of **Agriculture** and existing and emerging precision measuring technologies to ensure robust data sets that enable GHG monitoring
- support the development of global GHG monitoring methodologies through the **Livestock Environmental Assessment Partnership** (LEAP) program by offering the participation of Agriculture and Agri-Food Canada research scientists as technical advisors and financial contributions.

Conclusion

Red meat production is often negatively singled out in climate change discussions. In these discussions, it should be noted that there are large differences in GHG intensity within and across production systems around the globe. It is important to note these differences are often driven by complex factors out of the control of the individual beef farmer or country market. Canada is the 11th largest beef producer and 3rd largest exporter of high-quality beef in the world and, as such, our industry has a strong commitment to the social, economic and environmental sustainability of beef production. Though there is still work to be done, this commitment has resulted in highly successful innovations helping reduction of our GHG footprint – and Canadian producers remain world leaders in sustainability. It is imperative these successes are shared with other production systems to achieve the same standard worldwide.

Here in Canada, Canadians can enjoy beef as a part of a nutritious diet, confident in our modern production system, while understanding our industry remains focused on continuous improvement. Through strategic investment and commitment, further reductions in GHG can be, and are being, made. These investments will also have positive impacts for Canada's rural communities and the health of agricultural ecosystems delivering public goods for all Canadians.

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