Canadian Cattlemen's Association
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CALL FOR LETTERS OF INTENT
BEEF CATTLE INDUSTRY SCIENCE CLUSTER III (2018-2023)

The Beef Cattle Research Council (BCRC) invites letters of intent for the third Beef Cattle Industry Science Cluster. **The deadline is January 13, 2017 at 11:59 PM MT.**

The BCRC's mandate is to determine research and development priorities for the Canadian beef cattle industry and to administer national check-off funds allocated to research.

The BCRC developed the first and second Beef Cattle Industry Science Clusters under Agriculture and Agri-Food Canada's Growing Forward Strategy. The first Beef Cattle Industry Science Cluster was a four year initiative (April 1, 2009 and March 31, 2013) and the second was a five year initiative (April 1, 2013 to March 31, 2018). The Clusters brought together Canada's largest public and industry funders of applied beef research including AAFC, BCRC, provincial governments, provincial cattle associations, and other industry funders, and focused dollars and priorities on a comprehensive outcome-based research program directly aligned with industry's vision and priorities. The BCRC is planning to renew this program under AAFC's next agricultural policy framework and has started planning for the third Beef Cattle Industry Science Cluster covering the period **April 1, 2018 to March 31, 2023.**

Research Outcomes

The BCRC has established clearly defined research outcomes for the third Beef Cattle Industry Science Cluster through a comprehensive stakeholder engagement process. Please refer to the research outcomes highlighted below before deciding to submit a letter of intent.

Application Forms & Information

Letters of intent must be prepared on the form provided by the BCRC. The form, together with instructions, can be downloaded from **www.beefresearch.ca**. In the interests of improved funding efficiency, the BCRC reserves the right to share letters of intent with other research funders.

Project Timeframe

Projects up to five years in length may be submitted, but preference will be given for projects that are up to three years in duration; unless the need for a longer timeframe can be demonstrated. Projects will commence no earlier than April 1, 2018 (subject to AAFC approval of the Science Cluster) and must be completed by March 31, 2023.

Submission of Letters of Intent for Research

Letters of intent must be submitted no later than **January 13, 2017 in electronic format to proposals@beefresearch.ca**

Researchers will be notified by **February 15, 2017** if they have been invited to submit a full proposal. The deadline for receipt of invited proposals will be **April 14, 2017**.

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RESEARCH OUTCOMES DRAWN FROM THE NATIONAL BEEF RESEARCH AND TECHNOLOGY TRANSFER STRATEGY

For the competition, the Beef Cattle Research Council welcomes any letters of intent that work towards the achievement of the research outcomes outlined below.

The beef industry has defined three core research objectives under which more specific priorities and research outcomes are established:

1. To *enhance industry competitiveness and reduce production costs*, priority outcomes are to enhance feed and forage production, increase feed efficiency, and decrease the impact of animal health issues and production limiting diseases.

2. To *improve beef demand and quality*, priority outcomes are to reduce food safety incidences, define quality and yield benchmarks supporting the Canadian Beef Advantage, and improve beef quality through primary production improvements and the development and application of technologies to optimize cutout values and beef demand.

3. To improve *public confidence in Canadian beef*, outcomes are to improve food safety, strengthen the surveillance of antimicrobial use and resistance, develop effective antimicrobial alternatives, ensure animal care, demonstrate the safety and efficacy of new production technologies, improve environmental sustainability and measure the beef industry's environmental benefits.

For all Priority Areas, proposed research needs to give strong consideration to the following overarching aims:

1. Improved communication, collaboration and understanding between researchers and industry, with research/industry collaborations increasing to account for 25% of research activities.

2. Cost-benefit analysis completed to support recommendations and knowledge transfer from research projects that impact production profitability.

3. Encouragement of interdisciplinary teams undertaking systems-based approaches integrating appropriate parts of the value chain.

4. Investigate technologies with the potential to reduce labor and improve production efficiencies throughout the forage, cattle and beef production chain.

5. Enhanced awareness and consideration of relevant international research and development activities to avoid duplication and identify opportunities for collaboration.

Specific outcomes expected to be achieved by 2023 are listed below.

Specific Outcomes by Priority Area

Priority: Beef Quality

Outcome 1: Improve Customer Satisfaction with Canadian Beef; detailed outcomes include:

- Beef Quality Audit demonstrates a reduction in carcass defects below 2016 levels and maintained or improved consumer satisfaction for tenderness, juiciness and flavor of inside round, cross-rib, top sirloin and strip-loin steaks
- Develop and implement processes that facilitate the automated collection, recording, evaluation and communication of desirable (e.g. high lean yield/high marbling/healthy livers) and undesirable (e.g. low lean yield/low marbling/ abscessed livers) characteristics to enhance the Beef Quality Audit
- Identify potential interactions between tenderness genotype and animal management (e.g. implants, backgrounding, grassing, finishing, etc.) and develop appropriate breeding and management recommendations

Outcome 2: Validate and Support the Canadian Beef Advantage; detailed outcomes include:

- Improved algorithms for predicting lean meat yield and / or retail product percentage
- Complete a systematic literature review on the nutritional attributes of beef relative to other foods to address consumer concerns, inform consumer education programs, and identify appropriate research directions and applications
- Collect data regarding the nutrient density (per g) and value (cost per unit nutrient) of beef relative to other foods, including protein, mineral, vitamin, and lipid components

Priority: Food Safety

Outcome 1: Improved Food Safety along the Beef Supply Chain; detailed outcomes include:

- Develop and implement cost-effective technologies targeting multiple pathogens in cattle and beef production and processing facilities, including heat- and acid-resistant *E. coli* and biofilm-forming bacteria
- Develop and implement cost-effective technologies to rapidly and effectively detect STEC (e.g. *E. coli* O157) contamination in beef and trim
- Develop objective, cost-effective approaches for verifying effectiveness of packing plant equipment cleaning processes, and adopt them for 85% of processed cattle

Outcome 2: Improved Beef Quality and Food Safety Research and Training Capacity; specifically:

- Establish an industry meat science research chair to address issues facing the beef packing and processing sectors, and reinvigorate food safety research program capacity

Outcome 3: Outreach and Policy; specifically:

- Generate science-based information to inform regulatory approval of cost-effective methods of separating specified risk material (SRM) from non-SRM to reduce SRM disposal costs and the amount of material directed to landfill

Priority: Animal Health and Welfare

Outcome 1: Improved Surveillance of Production Limiting Disease and Welfare Issues; specifically:

- Expand the Western Canadian benchmarking initiative to a national survey of the incidence and economic impact of production limiting diseases, nutritional and health management, biosecurity practices, and welfare practices in cow-calf, backgrounding and feedlot operations

Outcome 2: Improved Prevention of Animal Disease and Welfare Issues; detailed outcomes include:

- Develop and promote cost-effective vaccination and management strategies that can be widely adopted throughout the beef production system to improve health, reproductive and performance outcomes.
- Identify or develop cost-effective management or treatment options that lead to improved control of internal and external parasites
- Develop revised feed mycotoxin levels to avoid adverse animal health and welfare impacts
- Develop and maintain a prioritized list of the 10 best animal health management practices to improve cow-calf sector profitability (e.g. vaccine timing, mineral nutrition, parasite control, etc.)
- Evaluate the cost-effectiveness of pain control products and strategies for avoiding or mitigating acute and chronic pain
- Define appropriate feed, water and rest intervals that optimize transport outcomes for different classes of long-haul beef cattle transported across Canada

Priority: Antimicrobial Use, Resistance and Alternatives

Outcome 1: Evidence-based antimicrobial resistance decision making and communication to the veterinary, producer and medical communities; detailed outcomes include:

- Conduct pilot projects to identify whether the prevalence of antimicrobial resistance in market beef cows, dairy cows and bob/veal calves differ from fed cattle, and include any found to have concerning levels of antimicrobial resistance into ongoing CIPARS surveillance
- Implement ongoing surveillance of antimicrobial resistance through sampling of live animals at feedyards, focusing on BRD pathogens and enteric bacteria
- Develop rapid, accurate, cost-effective technology to detect antimicrobial resistance in production environments
- Develop and verify best practices at the farm level to reduce antimicrobial resistance in bacterial isolates from both healthy animals and clinical cases

Outcome 2: Develop a broader toolbox for disease management; detailed outcomes include:

- Conduct an evidence-based risk-assessment of the effectiveness of alternative production practices (e.g. preconditioning, methods of reducing stress in weaned calves)
- Develop cost-effective nutritional and other management strategies to effectively reduce the need

for antimicrobials to control liver abscesses

- Investigate and develop simple, cost-effective alternative vaccine delivery methods to improve vaccination rates in the cow-calf sector
- Develop rapid, accurate, cost-effective chute-side diagnostic tests to evaluate whether cattle have been effectively vaccinated against specific pathogens
- Develop rapid, accurate, cost-effective diagnostic tools to detect disease before symptoms become apparent
- Develop a better understanding of the respiratory and gut microbiomes, their establishment and development in the neonate, and their relation to immunity and disease

Priority: Feed Grains and Feed Efficiency

Outcome 1: Improved feed efficiency through animal breeding; detailed outcomes include:

- Quantify the genetic relationships between feed intake and efficiency in cow-calf and feedlot production, and their relationships with other economically relevant beef production traits (longevity, fertility, weaning weight, wintering costs, carcass weight, yield and quality grades, tenderness, etc.)
- Identify genes with functional roles in microbiological and physiological processes that affect feed intake and efficiency in feedlot and cow-calf production

Outcome 2: Improved feed supply and utilization; specifically:

- Develop feeding strategies to optimize animal performance, nutritional value and cost of gain (e.g. ideal forage inclusion rates, grain processing/blending, high moisture corn, wheat, etc.)

Outcome 3: Maintained Feed Grains and Feed Efficiency Research and Training Capacity; specifically:

- Ensure maintenance and transition of key feed efficiency research and extension expertise and facilities

Priority: Forage and Grassland Productivity

Outcome 1: 15% Improvement in Yields and Nutritional Quality of tame, native and annual species through improved pasture, forage and grazing management and plant breeding; detailed outcomes include:

- Develop new annual and perennial grass and legume varieties with improved stand longevity, quality, yield, and adaptability (e.g. flood and drought resistance) through traditional and/or advanced plant breeding techniques
- Characterize corn and cereal forage variety differences in nutrient profile and ensiling potential
- Quantify varietal and species differences in the ability of grasses, legumes and annual forages to maintain nutritional quality throughout the grazing season and in extended stockpiled or swath

grazing systems to help inform producers' seed selection decisions

- Identify or develop improved grazing and range management strategies that optimize forage and beef production from native range and tame perennial pastures
- Investigate and refine regionally-appropriate methods of combining native, tame (annual and perennial) species and extended winter grazing practices to lengthen the grazing season and reduce winter feed costs, while meeting animal requirements
- Quantify the economic and agronomic benefits of integrated annual crop, forage and beef production systems

Outcome 2: Maintained Forage Research and Training Capacity; specifically:

- Establish industry research chairs focused on forage and grazing management and economics established to serve Central and Eastern Canada and in the Prairies and B.C.

Priority: Environmental Sustainability

Outcome: Science-based information to inform the development of effective public communication and policy development regarding environmental goods and services provided by the beef industry; detailed outcomes include:

- Develop cost-effective methods of reducing GHG emissions in forage-based diets
- Quantify factors impacting the rate and extent of C sequestration in tame and native pastures across Canada
- Quantify the impacts of native and tame pasture management on plant, animal, bird and insect biodiversity across Canada
- Quantify the impacts of native and tame pasture management on water use, cycles and watersheds across Canada
- Identify cost-effective cleaning technologies to reduce water use in beef packing and processing facilities