CALL FOR LETTERS OF INTENT
RESEARCH PROJECT

The Beef Cattle Research Council's (BCRC) 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 invites letters of intent for research aimed at achieving specific priority outcomes in identified program areas.

The deadline to submit letters of intent is October 7, 2022 at 11:59 PM MT.

Application Forms and Information
Letters of intent must be prepared using the file entitled 'BCRC Letter of Intent Form - Research' provided by the BCRC and submitted electronically to proposals@beefresearch.ca. The form, as well as instructions and guidelines for submission, can be downloaded from 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
Preference will be given to projects that are up to three years in duration; if the need for a longer timeframe can be clearly demonstrated, four or five-year projects may be considered. Projects will commence no earlier than April 1, 2023, with flexibility available after April 1st to ensure start dates work for with the project workplan. An approved project cannot start until confirmation of matching funds has been received.

Timelines
October 7, 2022 – deadline to submit letters of intent
November 2022 – applicants will be notified if they have been invited to submit a full proposal
January 20, 2023 – deadline to submit invited full proposals
Early March 2023 – researchers will be notified of the funding decision

Research Outcomes
The BCRC has established clearly defined research objectives. **Please refer to the detailed research outcomes listed beginning on page 2** before deciding to submit a letter of intent. In addition, all proposed research must give a strong consideration to the following overarching aims:

1. Increase producer profitability by increasing productivity or decreasing costs of production and risks.
2. Develop, enhance and encourage adoption of beneficial practices and innovations that maximize the environmental benefits industry provides and continue to reduce our environmental footprint, while supporting industry competitiveness.
3. Support continuous improvements in Canadian beef demand through advancements in the quality and safety of Canadian beef.
4. Generate science to inform decision makers, policy and best management practices and to support consumer confidence and public trust.
5. Develop, enhance and encourage adoption of leading-edge technologies that support industry competitiveness, automation and sustainability.
6. Ensure the maintenance and rejuvenation of critical research capacity and infrastructure that facilitate proactive inquiry and innovation to support industry advancement.

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

Through the Canadian Beef Research and Technology Transfer Strategy, the beef industry has defined several core principles under which more specific priorities and research outcomes are established.

For the competition, the BCRC welcomes any letters of intent that work towards the achievement of one or more of the specific research outcomes listed below by priority area.

Priority: Feed Efficiency and Utilization

Outcome 1: Improve feed grain and silage yields through plant breeding, agronomic practices, and harvest strategies
2. Investigate agronomic, harvest, and ensiling practices to optimize feed and silage yield, nutritional quality, and animal health and performance

Outcome 2: Investigate feed processing, by-products, additives, supplements or other feeding strategies that optimize productivity and profitability
1. Develop rapid and cost-effective ways to assess nutritional value, digestibility, and optimal processing of feedstuffs and by-products
2. Develop cost-effective methods to measure, and feeding strategies to ensure, uniform supplement intake on pasture
3. Re-investigate and update nutritional recommendations to maintain optimal animal health and performance
4. Investigate feed processing methods and practices, additives, and management systems to improve digestibility, animal maintenance costs, and cost of gain

Outcome 3: Improved feed efficiency through identification of genetic differences and animal breeding
1. Develop and validate practical, accurate and cost-effective ways to quantify forage intake in grazing cattle and feed efficiency in the cow herd and the feedlot
2. Validate genetic markers for feed efficiency in commercial crossbred cattle
3. Identify genes with functional roles in microbiological and physiological processes affecting feed intake and efficiency in feedlot and cow-calf production
4. Determine the impact of genetics, management, and environmental interactions on growth and reproductive efficiency

Priority: Forage & Grassland Productivity

Outcome 1: Improve the management and productivity of native/naturalized pastures to enhance profitability and discourage land conversion
1. Identify practices that optimize utilization and resilience of pastures which may include indicators of appropriate recovery times
2. Identify or develop cost effective management strategies to control the spread of invasive plant species on rangeland

Outcome 2: Better understand the impact of grazing management on plant, animal, and soil interactions and how the overall system contributes to plant and animal health and productivity

1. Quantify the impact of agronomic and grazing management practices on economic and environmental outcomes such as plant health, forage yields and quality, animal health and performance, soil carbon sequestration and organic matter, soil health and quality, water infiltration and nutrient cycling in different ecoregions of Canada
2. Identify and validate technology to simply and cost-effectively manage grazing systems and quantify improvements in forage productivity
3. Identify simple, practical, cost-effective indicators of soil quality that have impacts on forage quality and productivity

Outcome 3: Cost-effectively improve the agronomic performance, yields, nutritional quality, and palatability of annual and perennial tame species for grazing or stored forages

1. Develop strategies and best management practices to promote stand productivity and longevity, preserve forage quality, and prevent waste in stored forages
3. Independent comparisons of promising international and domestic forage varieties and mixtures on a meaningful scale to determine varietal and mixture adaptation under a range of environmental conditions and soil types

Priority: Environmental Sustainability

Outcome 1: Develop cost-effective ways to reduce greenhouse gas emissions, maintain or improve biodiversity, increase soil carbon, or improve water infiltration on pastures and rangeland

1. Validate grazing practices that improve water infiltration, forage yield, and soil organic matter in Canadian conditions across a variety of ecoregions
6. Develop or repurpose materials with the potential to reduce the amount of single use plastics along the forage, cattle and beef production, and supply chains

Outcome 2: Develop cost-effective ways to reduce feedlot greenhouse gas emissions and evaluate the impacts of manure nutrients on pasture and cropping systems

2. Quantify the effectiveness of forages to mitigate the nutrient mobility associated with extended winter grazing practices
3. Develop manure handling and processing technologies and strategies that enable manure to be transported and spread more cost-effectively

Outcome 3: Identify cost-effective ways to improve air, water and soil outcomes associated with beef packing and processing facilities

1. Develop and validate cost effective cleaning technologies that reduce water and sanitizer use in packing plants
2. Identify and develop new revenue streams that also reduce environmental impacts by utilizing carcass by-products
3. Develop technologies that reduce odors associated with packing plants
4. Develop strategies and technologies that reduce food waste in the packing plant

Priority: Animal Health & Welfare

Outcome 1: 92% of cows wean a calf each year through cost-effective improvements in nutritional and overall management

1. Refine nutritional and related management strategies to improve rebreeding success, calf survival and herd retention in replacement females

2. More precisely define micronutrient requirements and develop regionally-appropriate supplementation recommendations for breeding cattle of different ages throughout the production cycle
3. Assess the impacts of water quality on reproductive performance, health, and calf growth performance
4. Clarify how management practices impact reproductive performance in cattle that differ in their genetic potential for growth, efficiency and carcass traits

Outcome 2: Develop and promote the adoption of cost-effective management practices and technologies that reduce the need for and preserve the effectiveness of antibiotics
1. Continued development of alternative health products and management practices to maintain animal health and reduce the need for antibiotic treatment
2. Controlled trials to independently assess or validate the cost-effectiveness of promising traditional or alternative animal health products and/or management strategies
5. Assess how nutritional and health management (e.g., vaccination) of the cow herd impacts calf health pre- and post-weaning

Outcome 4: Improved prevention and mitigation of animal disease issues
3. Develop point-of-care and other diagnostic tools that rapidly, accurately, and cost-effectively identify infectious disease, immune/vaccination status, antimicrobial susceptibility/resistance or nutritional status
7. Identify and quantify biosecurity and animal health risks associated with transport rest stops and other commingling sites

Outcome 5: Improved prevention and mitigation of animal welfare issues
2. Develop cost-effective and easily administered options to alleviate procedural pain associated with castration, branding, and dehorning
3. Develop cost-effective chronic pain management strategies
4. Identify factors contributing to lameness, develop cost-effective preventions, treatment options, and methods to control or limit environmental spread of the pathogens involved

Priority: Beef Quality
Researchers submitting projects under this priority are strongly encouraged to collaborate with Canada Beef

Outcome 1: Improved customer satisfaction with Canadian Beef
3. Demonstrate the effectiveness of genetic markers to improve the uniformity and profitability of fed cattle

Outcome 2: Define, validate, and enhance the emotional and functional attributes of Canadian beef in domestic and international markets
2. Develop and conduct industry-led domestic and international surveys to audit customer / consumer preferences and perceptions of Canadian beef quality attributes and track changes relative to previous studies
3. Develop and conduct industry-led consumer sensory comparisons and cut performance of equivalent Canadian and competitors' products in domestic and international markets
4. Identify critical control points and develop best practices enabling processors, customers and importers to ensure maximum shelf life of Canadian beef to ensure food safety and quality and reduce food waste
5. Compare the shelf life of Canadian vs. competing beef in key export markets
6. Quantify the value difference between fresh and frozen beef for Canadian retailers, considering differences in wholesale price and cutting performance

Priority: Food Safety

Outcome 1: Ensured food safety along the beef supply chain

1. 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
2. Identify key spots in processing plants that are prone to contamination and difficult to clean, and develop alternative designs, surfaces, and cleaning strategies to facilitate effective cleaning

Outcome 2: Validate the efficacy and safety of new technologies in support of the rational regulatory approval and adoption of improved food safety interventions throughout the supply chain

1. Develop cost-effective cleaning technologies that reduce the need for (hot) water, sanitizers, and labour in large and small processing facilities
2. Conduct research to proactively identify and resolve potential market access concerns for Canadian beef