BEEF CATTLE RESEARCH COUNCIL

Canadian Cattlemen's Association
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CALL FOR LETTERS OF INTENT
BEEF CATTLE INDUSTRY SCIENCE CLUSTER II (2013-2018)

The Beef Cattle Research Council (BCRC) invites letters of intent for the second Beef Cattle Industry Science Cluster. **The deadline is May 30, 2012 at 11:59 PM MT.**

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

The BCRC developed the first Beef Cattle Industry Science Cluster under Agriculture and Agri-Food Canada's Growing Forward Strategy. The Beef Cattle Industry Science Cluster was a four year initiative (April 1, 2009 and March 31, 2013). It brought together Canada's largest public and industry funders of applied beef research (AAFC, BCRC, and Alberta Beef Producers), and focused dollars and priorities on a comprehensive outcome-based research program directly aligned with industry's vision and priorities. The BCRC is in support of renewing this program under AAFC's Growing Forward II program, and has started planning for the second Beef Cattle Industry Science Cluster covering the period between April 1, 2013 and March 31, 2018.

Research Outcomes

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

In light of the Beef Cattle Industry Science Cluster Initiative being developed in collaboration with Agriculture & Agri-Food Canada, major program proposals and collaborative initiatives, which clearly work towards addressing the research outcomes established by industry, will be considered.

Application Forms & Information

Letters of intent must be prepared on the form provided by the BCRC. Copies of the form, together with instructions, can be downloaded from **www.beefresearch.ca** All submitted letters of intent will be shared with Alberta Beef Producers.

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.

Submission of Letters of Intent for Research

Letters of intent must be submitted no later than **May 30, 2012 in electronic format to proposals@beefresearch.ca**

Researchers will be notified by June 15, 2012 if they have been invited to submit a full proposal. The deadline for receipt of invited proposals will be August 15, 2012.

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NATIONAL BEEF RESEARCH STRATEGY
RESEARCH OUTCOMES

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 two core research objectives under which more specific priorities are established:

- To *enhance industry sustainability and reduce production costs*, priority outcomes are to enhance feed and forage production, quantify the environmental impact of Canada's beef industry, increase feed efficiency, decrease the impact of animal health issues and production limiting diseases, and ensure animal care.

- 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.

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

- Improved communication, collaboration and understanding between researchers and industry.
- Research results accompanied by cost:benefit analysis to inform technology transfer and adoption of research results on-farm.
- Encouragement of interdisciplinary teams undertaking systems-based approaches integrating the entire value chain where appropriate.

Specific outcomes listed below are identified as short-, medium-, and long-term, which are expected to be achieved by 2016, 2018, and 2023 respectively.

Priority: Beef Quality

Outcome 1: Improved Consumer Satisfaction with Canadian Beef

Short Term

- Effectiveness and value of genetic markers for tenderness validated in commercial cattle.
- Electrical stimulation recommendations re-evaluated to reflect increased beef carcass weights.
- Objective in-plant measures of tenderness that can be used at line speed validated

Medium Term

- National Beef Quality Audit (consumer satisfaction) demonstrating that 65% of inside round, 80% of cross-rib, 90% of top sirloin and 99% of strip-loin steaks are sufficiently tender that no tenderness enhancement is necessary.
- Potential interactions between tenderness genotype and animal management (e.g. implants, backgrounding, grassing, finishing, etc.) identified and appropriate breeding and management recommendations developed.

Outcome 2: Validation of the Canadian Beef Advantage Relative to International Competitors

Short Term

- Packaging and other technologies to improve shelf life and appearance of beef developed.
- Canada's beef carcass quality and/or yield advantage benchmarked relative to international competitors.
- Beef InfoXchange System data integrated with research analysis in order to monitor changes in industry practices and identify emerging issues.

Medium Term

- Improved algorithms for prediction of lean meat yield and / or retail product percentage
- Genomic and grading technologies that allow for market segmentation according to carcass quality and/or yield implemented.
- National Beef Quality Audit enhanced through development and implementation of processes that facilitate the automated collection, recording and evaluation of carcass quality parameters.
- National Beef Quality Audit demonstrating a reduction in carcass defects below 2012 levels (targets to be determined).

Priority: Food Safety

Outcome 1: Improved Food Safety along the Beef Supply Chain

Short Term

- Technologies targeting multiple pathogens in cattle and beef production and processing facilities developed and implemented.

Medium Term

- Approaches to objectively determine the effectiveness of equipment cleaning processes in commercial packing plants developed and implemented.
- Increased surveillance to detect, characterize and quantify the relative human health risk of (re)emerging pathogens.
- Effective probiotic intervention to eliminate pathogens from beef developed.

Outcome 2: Responsible Antimicrobial Use Demonstrated

Short Term

- On-farm data collection and food safety pathogen incidence incorporated into the Canadian Integrated Program for Antimicrobial Resistance Surveillance for beef cattle.
- Microbial genome sequencing used to investigate potential associations between pathogen incidence and antimicrobial use in cattle and the presence of pathogens and development of antimicrobial resistance in microbes found in retail beef and human clinical cases.

Medium Term

- Statistics collected through the Canadian Integrated Program for Antimicrobial Resistance Surveillance (surveillance) demonstrate that:
    - generic *E. coli* samples collected from abattoir samples demonstrate 0% resistance to five or more antimicrobials and 0% resistance to antimicrobials of very high importance in human health, and
    - generic *E. coli* samples collected from retail beef demonstrate less than 2% resistance to five or more antimicrobials, and less than 1% resistance to antimicrobials of very high importance in human health.

Outcome 3: Improved Beef Quality and Food Safety Research and Training Capacity

Short Term

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

Priority: Forage & Grassland Productivity

Outcome 1: 33% Improvement in Yields and Nutritional Quality of tame, native and annual species through improved pasture, forage and grazing management and plant breeding

Short Term

- Improved grazing and management strategies that optimize hay yields and beef production from native range and tame pastures.
- 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 quantified.

Medium - Long Term

- 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 developed.

Outcome 2: Environmental Sustainability

Short Term

- The "environmental footprint" (carbon sequestration, plant and animal biodiversity, endangered species, soil erosion, watershed protection, etc.) and socio-economic (environmental goods and services) impact of the forage-beef sector in Canada, including the effects of optimal environmental production practices (e.g. stocking rates, riparian area protection) on the above has been quantified.

Outcome 3: Research and Training Capacity

Short Term

- Industry research chairs focused on tame grass and legume breeding and management/grazing established to serve Central and Eastern Canada and in the prairies and B.C. established.

Priority: Feed Grains & Feed Efficiency

Outcome 1: Improved feed efficiency through animal breeding

Short Term

- Cost-effectiveness of genetic markers for feed efficiency validated in commercial feedlot cattle.

Medium Term

- Impacts of genetic selection for feed efficiency on other economically relevant beef production traits (longevity, fertility, weaning weight, wintering costs, carcass weight, yield and quality grades, tenderness, etc.) quantified.
- Potential interactions between feed efficiency genotype and management (e.g. implants, backgrounding, grassing, finishing, etc.) identified and appropriate breeding and management recommendations developed.
- Relative contributions of various animal metabolic processes and rumen microbes to feed efficiency quantified.

Outcome 2: Improved feed supply and utilization

Short Term

- The cost:effectiveness of alternative / by-product energy feeds, considering impacts on animal performance, health, product quality, and nutrient management have been identified, evaluated and determined.
- Corn and cereal forage variety differences in nutrient profile and ensiling potential characterized.
- Feeding and production systems that improve feed efficiency by 15% developed.

Medium Term

- Agronomic strategies to increase feed grain energy yield per acre identified

Outcome 3: Improved management of manure nutrients

Medium Term

- Nutrient management decision tools that incorporate diet nutrient composition, manure handling and transport costs, value of manure nutrients and organic matter, manure management systems (e.g. raw vs. stockpiled vs. composted) soil types, and nutrient uptake by crops developed.

Priority: Animal Health & Welfare

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

Short Term

- Improved diagnostic tests for production limiting diseases
- Nation-wide benchmarking survey of the incidence and economic impact of production limiting diseases, health management, biosecurity practices, and welfare practices in beef cattle (cow-calf, backgrounding and feedlot) conducted.

Medium Term

- National production limiting disease surveillance program developed, identifying opportunities to collaborate with wildlife disease surveillance programs.

Outcome 2: Improved Understanding and Management of Pain and Stress in Beef Cattle

Short Term

- Practical, cost- effective methods of objectively quantifying and mitigating pain and stress in beef cattle under production conditions (e.g. diet, castration, de-horning, branding, weaning, transport) developed.

Medium Term

- Benchmarks to understand the additive effects of beef production practices on pain, stress, immunity and health developed.
- Scientifically valid beef cattle welfare audit program developed.

Outcome 3: Improved Prevention of Animal Disease and Welfare Issues

Short Term

- Strategies to optimize or improve the effectiveness of existing vaccination programs identified or developed.
- Reduced incidence of reproductive failure through improved nutritional management, diagnostic tests, vaccination and biosecurity.
- Reduced neonatal loss through improved maternal nutrition, timing of vaccinations, and extension / technology transfer to cow/calf sector.
- Modifications to current beef production practices that reduce the need for antimicrobials to prevent or treat respiratory disease in the feedlot (e.g. vaccination, weaning, transport and diet) identified or developed.
- Improved control of internal and external parasites.

Medium Term

- Practical modifications to high energy feeding programs that reduce the incidence of metabolic diseases (e.g. acidosis, bloat, acute interstitial pneumonia) in feedlot cattle identified or developed.
- Improved immune system function, vaccine efficacy and animal health management to reduce the need for Health Canada Category I and II antimicrobial drugs by 50%.