



Canadian Poultry  
Research Council

Le Conseil De  
Recherches Avicoles  
Du Canada

## Call for Letters of Intent

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April 2012

**Dear applicant: Please note that the Canadian Poultry Research Council (CPRC) has adopted a two-stage grant review process involving:**

- 1. Industry review of Letters of Intent (LOIs)**
- 2. Scientific review of detailed methodology**

**Please refer to the 'Notes to Applicants' section of this document for details.**

On behalf of its member organizations, CPRC is calling for LOIs in the following priority areas. Please also consult the CPRC Member priority lists at the end of this document for more details on specific areas:

### 1. AVIAN GUT MICROBIOLOGY, RESISTANCE AND ALTERNATIVES TO ANTIMICROBIALS

The poultry sector is increasingly interested in research that defines the prudent use of antibiotics and explores innovations that will provide an array of alternative methods with which to combat disease and optimize flock performance.

#### **Industry Goal**

Continue to promote the prudent use of antimicrobials, reduce their use where possible and increase the use of antimicrobial alternatives.

#### **Research Target Outcomes**

- Understand the link between the use of antimicrobials in the poultry industry with emergence of bacterial resistance in animals and humans
- Understand the mechanism of resistance to common antimicrobials
- Development of evidence-based mitigation procedures/tools related to the use of antimicrobials based on:
  - International lessons
  - Effect of currently used antimicrobials on gut microflora, emergence of resistance and avian immunity
- Alternatives to currently used antimicrobials
- Understanding of the impact of alternative production systems and genetics

#### **Previously funded research**

Several projects have received CPRC support as part of the Avian Microbiology Network (AviMicroNet) which is directed towards a better understanding of the effects of antibiotics on microbes in the avian gut. The following research was supported by CPRC under the AviMicroNet theme:

- Understanding the effects of antibiotic use on population changes and gene expression in gut microflora, and the subsequent effects that these changes have on the bird's immune system
- Determining why certain strains of the bacterium *Clostridium perfringens* cause necrotic enteritis in birds, while others do not; finding the reasons behind these differences will provide insights into the epidemiology of the disease which may, in turn, lead to better control measures
- Characterizing polysaccharide hydrolysis products from carbohydrase enzymes to determine their effect on gut microflora *in vitro* and *in vivo*
- Understanding how *Campylobacter jejuni* colonizes the gut of the bird, insights into which may lead to development of a vaccine or other control strategy for this bacterium
- Using cyclic-di-GMP to stimulate avian immune responses to pathogens
- Engineering phage products for controlling *C. jejuni* populations
- Investigating cell-cell signaling in *Clostridium perfringens* infection for developing a novel disease-control strategy
- Investigating pathogenic characteristics of *Clostridium perfringens* and its interactions with the avian host

- Development of live-attenuated vaccines to prevent *Campylobacter* colonization in poultry
- Evaluation of vacuum post pellet-applications of bioactives of broiler feed on efficacy and protected delivery
- Formulation and delivery of immunostimulatory oligodeoxynucleotides containing CpG motifs (CpG-ODN) with carbon nanotubes (CNTs) against poultry diseases
- Understanding the effect of prebiotics on gut microflora in healthy and *Salmonella* challenged broilers
- Surveillance of antimicrobial resistant bacteria in antimicrobial-free and conventional broilers
- Stimulation of the innate immune system for disease control.

## 2. ENVIRONMENT

Canada's poultry value chain has made significant progress in reducing its environmental footprint and in providing better environmental conditions for both the birds and the people who work with them.

Significant challenges continue to emerge, however, as we better understand the environmental impact of day-to-day poultry production practices and potential emerging requirements for such things as the disposal of birds to control a disease outbreak. The complexity of factors that affect air quality in production units is garnering more attention in relation to the well-being of poultry workers and the birds themselves. Reducing the environmental footprint of poultry manure and other waste materials from the poultry production and processing system may include innovative, value-added products and modifications to poultry diets.

### ***Industry Goal***

Minimize the effects of poultry production practices on birds, humans and the environment, and encourage sustainability.

### ***Research Target Outcomes***

- Mitigate the impact on humans, birds and the environment of ambient air quality, emissions of ammonia and particulate matter, waste materials, leachates, pharmaceutical residues, greenhouse gases, etc.
- Improved waste management systems at all levels of the poultry production system
- Reduce clean water consumption during processing
- Understand relationship between production practices (e.g.: location, geography, bird density) and environmental impact
- Develop alternative energy and other techniques to utilize poultry by-products and ensure that there are no unused carcass components

### ***Previously funded research***

The following research was supported by CPRC under the Environment theme:

- Distribution Uniformity and Emission Reduction Potential of a Precision Applicator for Surface and Sub-surface Land Application of Poultry Manure
- Development of a Dynamic Model of Ca and P flows in Layers
- Activity-specific Workplace Exposures of Poultry Barn Workers
- Reducing Pollution from Veterinary Pharmaceuticals in Agricultural Runoff from Poultry Manure
- Protein-based biomaterials from spent hens.
- Assessment of concentrations and emissions of airborne pollutants at various poultry operations
- Evaluation of phosphorus utilization by broilers using different approaches

**NOTES FOR APPLICANTS - *the grant review process has changed, please read:*****Grant Review Process**

CPRC has adopted a two-stage grant review process involving 1) an industry review of LOIs; and 2) a scientific review of methodology.

**Stage 1 Industry review of Letters of Intent (LOIs)**

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**Please use the attached LOI form for your submission.** Instructions on completing the form are included. 

Please email your completed LOI in Word format to [info@cp-rc.ca](mailto:info@cp-rc.ca) by **June 1, 2012 5:00 pm EST**.

If you do not receive email confirmation of your submission within two business days, contact the CPRC office.

If your completed LOI does not already include a signature, please also forward a signed electronic scan to [info@cp-rc.ca](mailto:info@cp-rc.ca) or hard copy to:

Canadian Poultry Research Council  
350 Sparks Street  
Suite 1007  
Ottawa, ON K1R 7S8

Your electronic submission is due June 1, however signed hard copies need not arrive by June 1.

**Budget**

Applicants should limit their requests from CPRC to a maximum of \$20,000 per year over three years for a total of \$60,000 per investigator. Collaboration among multiple investigators working towards a common objective(s) is encouraged and overall budgets exceeding \$60,000 will be considered for such collaborations, especially when involving multiple institutions. Budgets exceeding \$60,000 per investigator should be discussed with the CPRC office before submitting an application for evaluation.

Industry dollars, whether from CPRC or other industry sources, must be matched with non-industry dollars at a ratio of at least 1:1. Higher leverage ratios are preferred.

**Review process**

LOIs will be scored on the following criteria:

- **Scientific concept and approach:** The proposal must be scientifically sound, technically feasible, and promise either to generate new knowledge or to apply existing knowledge in an innovative manner.
- **Industry impact:** The proposal must identify how the work will benefit the poultry industry, especially in terms of helping industry reach its research target outcomes, and should outline any additional potential social and/or economic benefits that will be realized in Canada.
- **Knowledge transfer and commercialization:** The proposal should describe how outcomes of the work will be shared with the research community and how it might be utilized by industry, including suggestions on how the resulting technology might be commercialized.

Collaboration among scientists and institutions is encouraged and will be a consideration during the review process.

All applicants will be informed of the CPRC Board decision to accept or reject the LOI. Successful applicants will be invited to submit a detailed description of the proposed methodology (Stage 2, described below).

**Stage 2 Scientific review of detailed methodology.**

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Based on the review of LOIs, successful applicants will be invited to submit a Detailed Proposal that includes specifics of the proposed methodology. Further details and application guidelines will be provided at that time.

All applicants will be informed of the CPRC Board decision to accept or reject the Detailed Proposal. CPRC will commit to funding successful applications at the end of this stage, provided matching funds

are secured. The preference is that funds from the poultry sector (CPRC and other sources) be matched at least 1:1 with funds from outside the poultry sector (e.g. other agricultural sectors, private sector, government funds etc.). CPRC staff are available to assist in applying for matching funds.

### **Future Calls**

After considering input from the CPRC Scientific Advisory Committee, as well as current budget limitations, the CPRC Directors have decided to announce annual Calls for Letters of Intent that pertain to two research priority areas at a time. The priority areas planned for the next call (April 2013) will pertain to 1) Poultry Welfare and Behaviour and 2) Food Safety and Quality, Poultry Health and Disease. However, please note that priority areas may change prior to next year's call based on the results of the Research Strategic Planning Process that will be complete this year. Any such changes will be announced prior to next year's call.

With input from academe, government and industry, the CPRC will continually review its research priority list and, if necessary, adjust it to reflect existing and emerging issues of importance to its members. Provided they remain of high importance, individual priority areas will be the subject of future Calls at regular intervals so as to promote continuity in existing research programs.

### **Questions?**

Inquiries regarding this call for Grant Applications should be directed to Dr. Bruce Roberts via email at [bruce.roberts@cp-rc.ca](mailto:bruce.roberts@cp-rc.ca) or phone at 613-566-5916.

## CPRC MEMBER PRIORITY LISTS

As additional information, please see the following research priority lists from each of the CPRC Members. Please note that, where indicated, these lists are for overall research priorities and may include areas that are outside the current Call for LOIs.

### Canadian Hatching Egg Producers (overall)

- Production-based research
  - Low production of young breeders
- Food safety
  - Alternatives to antibiotics
- Control of Salmonella
  - General control
  - Salmonella vaccination programs – methods and effectiveness
- Breeder welfare
  - Feed restriction programs
  - Euthanasia methods for birds >3kg
  - Male mortality/longevity, including the influence of barn design, feed delivery systems or genetic influences
  - Early mortality of breeder hens
- Environmental research
- Poultry health and disease
  - White chick syndrome
- Dark-meat utilization

### Chicken Farmers of Canada

Two projects have been identified by CFC Directors that will be given priority when assessing funding requests. CFC would like to see research proposals for the following two projects:

- On-farm trials of alternatives to antibiotics with the intent of reducing antimicrobial use to demonstrate their effectiveness and impact on gut health, with a focus on necrotic enteritis, and production.
- Barn management conditions and the impact on avian gut microbiology and antimicrobial resistance.
  - An examination of the effectiveness of 1) rest periods, 2) dry cleaning and 3) wet cleaning and disinfecting on pathogen reduction and antimicrobial resistance based on variable lengths of rest periods, products, and environmental conditions.

CFC's general priority list for Avian Gut Microbiology and the Environment are as follows:

#### ***Avian Gut Microbiology***

- Alternatives to antibiotics – examining different pre and pro-biotics and their impact on the bacteria community in the gut
- Effective vaccines to prevent Necrotic enteritis

#### ***Environment***

- Methods of reducing pollutant gases which are emitted by poultry manure within the barn and during spreading of manure
- Air quality
  - Improve air quality (ammonia) for both birds and workers
  - Humidity performance and how to deal with outside temperatures
  - Ammonia vs. humidity vs. carbon dioxide for air quality measurement

## Egg Farmers of Canada

### *Environment*

- Identify and compare alternative energy sources generated and used on egg farms:
  - Develop technologies such as bio-digesters or bio-fuels using manure
  - Quantify the associated costs for alternative technology set-up and maintenance
- Examine egg farms for ways to reduce harmful environmental effects and/or reduce operating costs:
  - Ventilation systems for filtration and/or absorption of ammonia and other gases, excessive humidity, dust and/or odour. Gather baseline information to benchmark from
  - Recycling/exchange systems to make use of heat and gas (CO<sub>2</sub>) emissions
  - Develop alternative technologies for on-farm layer euthanasia, disposal and transportation vehicles carrying live birds to slaughter
- Develop new technologies for storing and/or composting poultry manure and for limiting pathogens or reducing phosphorus within poultry litter
- There may be concern with current strains of laying hens adapting to emerging environmental issues (ex. Disease outbreak) due to the loss of genetic diversity, therefore we suggest:
  - development of new technologies and/or improvement of existing technologies for the proper isolation, storage mediums, and preservation and transfer of genetic material

## Turkey Farmers of Canada

### *Avian Gut Microbiology*

- Assess and manipulate feed withdrawal processes to determine the effect of timing, transportation distance, and finisher diet on meat quality and characteristics (e.g., water loss), and bacterial load.
- Evaluate and further develop flock management practices that reduce the need of antimicrobial use in turkey production.
- Explore the turkey production and flock health effects of feed formulations with varying levels of macro and micronutrients.
- Explore the use of novel feedstuffs, feed additives, and/or the modification of existing feedstuffs to create more nutritionally efficient turkey diets.

### *Environment*

- Assess and validate farm production methods that promote the reduction of environmental contaminants from turkey farms (e.g., phosphorous, nitrogen, ammonia, dust).
- Develop practical alternative uses for turkey processing by-products.
- Identify and explore alternative uses for turkey manure.