

Dairy Cattle Genetics Research & Development Council (DairyGen) of Canadian Dairy Network

- Research Priorities for 2012 -

DairyGen is the national dairy cattle genetics research council of Canadian Dairy Network (CDN) and regroups all dairy cattle improvement organizations including A.I., breeds, milk recording and Dairy Farmers of Canada (DFC). With an annual budget of approximately \$415,000 collected from the industry organizations, and the accompanied government matching support, the DairyGen Council of CDN supports high priority research in the area of dairy cattle genetic improvement. To gain operational efficiencies, DFC provides administrative services to DairyGen.

The DairyGen Council of Canadian Dairy Network invites researchers in the areas of quantitative genetics, genomics, economics, food science, as well as other areas related to dairy cattle, to submit Letters of Intent or Full Applications for proposed research to be initiated in 2012 that coincides with at least one of the priority topics below. Electronic submissions of Letters of Intent or Full Applications are highly preferred and should be sent to Émie Désilets (Emie.Desilets@dfc-plc.ca) and Filippo Miglior (Miglior@cdn.ca). Submission forms as well as DairyGen Guidelines for Grant Application have been provided in the electronic mailing of the DairyGen Call for Letters of Intent and full application but they are also available from either contact person above and via a link to the DairyGen Council on the CDN web site (www.cdn.ca). The DairyGen Council of CDN has established the following areas of high research priority:

Animal Health, Low Immune Response and Disease Resistance

The increasing frequency of health-related problems at the farm level has raised producer and industry awareness of the importance of proper animal health and disease control. In addition, improving animal health is expected to have a positive impact on human health through increased product safety, reduced human exposure to pathogens, decreased microbial resistance to antibiotics and drugs, etc. There is, therefore, interest in looking at traits in this area from a genetic perspective including genetic variation and relationships with other traits.

Breeding Strategies and Objectives

Given the significant developments allowing for the application of genomics to improve the accuracy of genetic evaluations, especially for young bulls, heifers and cows, research is needed to compare the benefits of various strategies for breed improvement and selection, which may or may not include traditional young sire progeny testing schemes. Also of interest is the development of genetic selection strategies aimed at controlling the current reduction in genetic variation due to increased inbreeding levels in dairy cattle populations. There is an immediate need to establish a national genetic evaluation system for health and disease traits in dairy cattle, which is expected to be a family of traits to significantly benefit from the use of genomic evaluations for selection and herd-based decision tools.

Genetic Evaluation & Data Analysis

New techniques have been implemented to analyze data collected on-farm and to calculate genetic evaluations. Research should address ways to maximize the use of on-farm data systems to increase the accuracy of evaluation and ways of combining data and/or information to increase the accuracy of prediction. This may apply to genomic as well as phenotypic data.

Cow Profitability

In conjunction with selection placed on improving levels of production, producers are striving to increase their net profits. While good management can alleviate some of the stresses associated with high production, producers are looking for the genetic means to build a more profitable cow for both current and future production environments. Genetic parameters for traits of economic importance need to be identified and validated, thus permitting the development of a cow profitability index and related genetic evaluation systems. Studies involving the economic analysis of the various components related to cow profitability are continuously needed. Cost effective data collection methods are required to channel relevant data into these systems. Traits of major importance include:

- Genetic variation and economics of locomotion, mobility, lameness and crampiness
- Economics of reproductive performance traits
- Genetic variation of fatty acid levels in the rumen and blood stream and their association with other traits of economic importance in dairy cattle

Genetic Improvement for Value-Added Milk Components

Previous research globally has identified compounds in milk that have human health benefits such as nutraceutical properties. Satisfying the needs of increasingly health conscious consumers may provide economic benefits for producers. Further research should focus on the possibility of genetically optimizing levels of the following compounds in milk:

- Calcium, other minerals & Lactose
- Omega-3 Fatty Acids & Conjugated Linoleic Acid (CLA)
- Cholesterol
- Milk Properties (i.e., milk coagulation for cheese production)

Novel Ideas and New Technologies

The five main areas of research priorities for the DairyGen, as outlined above, reflect those that are currently of greatest interest to producers and the industry. The DairyGen Council of Canadian Dairy Network also encourages researchers to submit proposals incorporating novel ideas and new technologies, either through quantitative genetics, genomics or epigenetics that might have a beneficial impact on dairy cattle improvement.

The deadlines for submission of Letters of Intent or Full Application to DairyGen are **January 15th, May 15th and September 15th of each year**. Researchers are welcome to submit multiple proposals, if desired, but topics that most closely meet the industry priorities for research in dairy cattle genetics will have greater rates of success. If approved by the DairyGen Council of Canadian Dairy Network, a full project proposal will be requested in May for submission to DairyGen by the end of July.

Should there be any questions regarding the DairyGen Council procedures and priorities, please feel free to contact Canadian Dairy Network at your convenience. Thank you in advance for your interest in the DairyGen Council activities and we look forward to receiving the various Letters of Intent or Full Application for this year.

Sincerely,



Brian Van Doormaal
General Manager
Canadian Dairy Network