List of Major Research Projects Funded through the Swine Cluster 2 Program (2013-2018)

Nutrition

1 Innovative piglet management strategies for optimum performance up to slaughter weight and profitable pork production

Denise Beaulieu, Vahab Farzan, Robert Friendship, Frédéric Guay, Kees de Lange, Julang Li, Niel Karrow, J. Jacques Matte, Martin Nyachoti, Jim Squires, Andrew Van Kessel, Ruurd Zijlstra (*et al.*)

The main objective of this project is to develop effective newborn and newly weaned piglet feeding strategies that maximize profits based on performance up to market weight, minimize reliance on in-feed antibiotics, and improve pig robustness and health.

2 Increasing sow milk yield and piglet growth via low-cost feeding and management strategies during gestation and/or lactation

Denise Beaulieu and **Chantal Farmer** (*et al.*)

The main objective is to develop low-cost feeding and management strategies that will increase sow milk yield and piglet growth while ensuring maximum animal welfare.

3 Feeding programs for growing – finishing pigs to enhance global competitiveness: opportunities across Canada

Denise Beaulieu, Eduardo Beltranena, François Dubeau, Robert Friendship, Frédéric Guay, Kees de Lange, Marie-Pierre Létourneau-Montminy, Julang Li, Ira Mandell, Martin Nyachoti, Candido Pomar, James Squires, Ruurd Zijlstra (*et al.*)

This project aims to match dietary nutrient supply with the growing-finishing pig's nutrient requirements to reduce feed cost per kilogram of carcass or lean pork and also to reduce nutrient losses into the environment.

4 Feeding organic minerals to gilts and sows: effects on milk quality and litter performance

Chantal Farmer (*et al.*)

This project intends to determine the impact of a partial substitution (50%) of inorganic for organic trace minerals during the growing-finishing, gestation and lactation periods over two parities. The effect of treatment on sow milk composition as well as growth and survival of their suckling piglets will be established.

Animal Welfare

5 Determining the Optimum Space Allowance for Nursery Pigs

Jennifer Brown (*et al.*)

The main objective of this study is to establish a precise value for the minimum space allowance for nursery pigs, one which provides an optimal and scientifically defensible balance between profitability and animal welfare.

6 National Sow Housing Conversion Project

Jennifer Brown (*et al.*)

The main goal of this work is to assist Canadian pork producers in the transition to group-housing systems for sows by providing technical and engineering support for barn renovations, and documenting renovations on commercial farms in Quebec, Ontario, Manitoba, Saskatchewan and Alberta. Researchers will be recording pig management and productivity before and after the transition and documenting the renovation process, management changes and costs, as well as providing up-to-date scientific information on group-housing options. In this way the project will generate valuable technical information to help producers make a sustainable and productive transition to group-housing.

7 Optimizing Flooring and Social Management of Group Housed Gestating Sows

Laurie Connor (*et al.*)

The main objective is to determine the factors associated with flooring and social management of group-housed sows that promote sow well-being and the viability of pig production.

8 Monitoring the effects of transport on the behaviour, physiology, carcass and meat quality of pigs through the study of truck micro-climate, vibrations and cooling systems

Luigi Faucitano (*et al.*)

The outputs of this study will provide the pork industry with a practical procedure to apply on the truck in warm conditions and new knowledge about vehicle design features. The objective is to limit animal losses during transport and also to improve pork quality.

Animal Health

9 Epidemiology of porcine reproductive and respiratory syndrome virus (PRRSv) among swine herds in Quebec, an applied research program in support to PRRS control projects

Sylvie D'Allaire (*et al.*)

This research project will take a multidisciplinary approach to develop and apply a new methodology integrating traditional and molecular data to assess various aspects of PRRSv transmission dynamic.

10 Towards the development of a method for determining the antimicrobial susceptibility of Brachyspira

Joseph E. Rubin (*et al.*)

This project is to develop, standardize and implement antimicrobial susceptibility testing methods for Brachyspira spp. so as to improve the Canadian swine industry's ability to combat Brachyspira-associated disease by providing evidence-based treatment recommendations.

11 New tools to enable effective genomic selection for disease resilience

Graham Plastow (*et al.*)

The main objective of this project is to deliver genomic tools to enable the selection of more resilient commercial pigs while maintaining competitive reproductive and production performance in Canada.

12 Bio-exclusion and bio-containment strategies to control epidemics resulting from airborne viral and bacterial transmission

Caroline Duchaine (*et al.*)

This project is to evaluate the effect of different bio-exclusion and bio-containment strategies on the amount and transmission of airborne viral (Porcine reproductive and respiratory syndrome virus [PRRSv], Influenza virus) and bacterial (Streptococcus suis serotype 2) pathogens.

13 Development of a multiplex Luminex immunoassay for serologic diagnosis and subtyping of swine influenza virus (SIV) infections

Yohanes Berhane (*et al.*)

The main objective of this project is to develop a multiplex immunoassay to identify antibody response to SIV infections rapidly and identify the influenza hemagglutinin (HA) and neuraminidase (NA) subtype.

14 Dynamics of influenza infection in swine populations

Zvonimir Poljak (*et al.*)

The main objective of this project is to understand the epidemiology of influenza viruses in swine, and to design optimal control and surveillance strategies at herd and regional levels.

15 Technology and Methodology Development for Improved Biosecurity in Livestock Transport Vehicles – Phase 2: Preliminary System Development and Data Acquisition

Terry Fonstad (*et al.*)

Develop a preliminary vacuum system to clean typical livestock trailers and a preliminary procedure to inactivate pathogens of concern in these trailers.

Technology

16 Use of novel technologies to optimize pig performance, welfare and carcass value

Brian Sullivan (*et al.*)

The main objective of this project is to use new technologies to develop objective and accurate phenotypes for growth, feed efficiency, welfare, carcass value and meat quality in Canadian pigs.

Pork Quality

17 Increasing Canadian pork consumption, market share and competitiveness through enhanced nutritional values and overall quality with a functional molecule in pork meat

Claude Gariépy and **Brian Sullivan** (*et al.*)

The main objective of the project overall is to differentiate Canadian pork by increasing the content of a functional molecule in the meat.

18 Objective methods for the evaluation of marbling and other meat quality traits

Laurence Maignel (*et al.*)

Provide objective, quick and accurate methods and technology for the evaluation of marbling and other pork quality attributes in various pork cuts for commercial applications in primary processing plants.