

2013 / 2014 ANNUAL REPORT

Driving results through

# THE INNOVATION WAVE



Swine Innovation Porc



## Swine Innovation Porc

**Swine Innovation Porc increases  
Canadian swine industry competitiveness  
through a national R&D structure**

**Business office:** Place de la Cité, Tour Belle Cour  
2590, boul. Laurier, suite 450, Québec (QC) G1V 4M6

Telephone: 418-650-4300 Fax: 418-650-1626

[www.swineinnovationporc.ca](http://www.swineinnovationporc.ca)

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Canadian Pork Council  
Conseil canadien du porc

# Table of contents

- 2 Message from the Chair**
- 4 Management Report**
- 6 Strategic Plan 2013-2018**
- 8 Research Program**
- 26 Canadian Swine Research Lead User Project**
- 28 Board of Directors**
- 29 Management Team**
- 30 Science Advisory Body**
- 31 Financial Partners**



# Message from the Chair

**2013-2014 has been a very busy year for Swine Innovation Porc (SIP). We have brought Swine Cluster 1 to a close and are now transitioning to Swine Cluster 2. In May, 2014, the Honourable Gerry Ritz, Minister of Agriculture and Agri-Food Canada (AAFC), announced the funding of our 2013-2018 research program. We thank the Minister for his government's demonstrated confidence in the Canadian Pork industry by providing the significant contribution of \$13 million of research money for our industry. In 2014-2015 fifteen research projects will start to bring in a total research investment of \$17 million over the next four years.**

## Partnership

Swine Innovation Porc has always tried to align its current actions with the strategic orientations of the Canadian Pork Council (CPC), the provincial organizations and the private stakeholders. In this respect the Board has undertaken to communicate more frequently with the research community, AAFC and our partners. We wish to better understand their needs, address problems and strive to develop solutions while meeting our contractual obligations with AAFC. Our aim is to leverage the private funding from the provincial organizations and the industry not only to deliver the cluster program under Growing Forward 2, but also to have funds available to address any high priority national research needs which might arise. We need to increase the return on the investment in the setting up of SIP. We anticipate providing regular updates concerning new research priorities and facilitating the valuable research needed, in addition to communicating the results of research.

Discussions continued last year with the members of our Board of Directors who represent provincial organizations, regarding our memorandum of understanding to leverage a significant investment for swine research by pooling part of their research dollars. 2014-2015 should see this partnership finalized with the signing of Alberta Pork, Les Éleveurs de porcs du Québec, Manitoba Pork, Ontario Pork, PEI Pork, SaskPork and Porc NB Pork.

A number of private contributors have already confirmed their commitment to the Research Program. Their investments are much appreciated and serve as confirmation that the projects included in the Program reflect our industry's research priorities.

Now that the Growing Forward 2 Agri-Innovation Program is under way, we would also like to have regular meetings with AAFC's Department officials regarding issues of common interest. It is our intention to resolve any such issues quickly.

Last year also saw Swine Innovation Porc become a regular member of the Pork Value Chain Round Table. Our presence at the Round Table enables us to develop and share research needs, activities, results and concerns.

## Transfer of Knowledge

Part of SIP's mission is to have the good practices and technologies adopted at the farm level. Now that the researchers are at work, we will seek partnerships and funding to ensure an efficient transfer of knowledge coming from their results.

## Strategic Plan

The Board approved our Strategic Plan in 2013. Now that the transition period has ended, we will begin implementation this year in regard of our four pillars:

- 1 - Leadership (needs, priorities)**
- 2 - Capacity (expertise, succession)**
- 3 - Relationships (partners, clients)**
- 4 - Quality (research, expertise)**

## A Sustainable Corporation

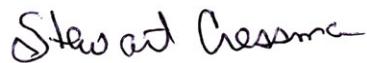
To ensure SIP's continued existence, we must develop and implement a business model that will help us to fulfill our mission, reach our strategic objectives and generate sufficient revenues by providing value to our partners. The Board has provided direction in this regard: by the end of 2014-2015 we are to have a business plan that is approved by the Board, our provincial partners and CPC.

## Acknowledgments

The Corporation appreciates the trust of AAFC and of our partners and so, it must now deliver the Swine Cluster 2 Research Program. SIP must both continue to understand its partners' concerns and to add value to the swine sector, thereby securing its future.

In closing, I would like to thank the Board members for their time and dedication to Swine Innovation Porc over the past year. Their vision and contribution are valuable to the entire industry.

I would especially like to thank SIP staff for their dedicated work and commitment to the corporation during the transition period.



**Stewart Cressman**  
Chair



This year has been a transition year between two research programs. Now, since the announcement of our Swine Cluster 2, we are in a position to commence implementation of our five-year Research Program.

## Research programs

### **Swine Cluster 1 (2010-2013)**

Although our first Swine Cluster research program ended on March 31, 2013, the management team went on with the activities already underway, such as the follow-up of the reports and financial statements with AAFC.

### **Swine Cluster 2 (2013-2018)**

The Swine Cluster 2 program consists of an amount of \$2.6 million that is allocated to research activities carried out by researchers from AAFC and from the Canadian Food Inspection Agency (CFIA). The program also consists of \$14.6 million that is dedicated to research that will be carried out in universities and research centres together with management and strategic activities.

For the next five years, the Swine Cluster 2 program will focus on activities that aim to:

- reduce production and feed costs;
- increase product attributes and prices;
- enhance adaptability and sustainability.

The retained research projects went through an extensive evaluation process including an assessment by an external scientific committee, the Science Advisory Body.

# Management Report

## Communications & knowledge transfer

### **Swine Cluster 1**

A great deal of work was done in order to complete the transfer of knowledge from the 12 research projects funded in the program to the producers. Our Research Coordinator and the Prairie Swine Centre brought the transfer to completion by preparing factsheets with the results of each project. These sheets are now available on our website: [www.swineinnovationporc.ca](http://www.swineinnovationporc.ca).

### **Canadian Swine Research Lead User Project**

The management team and the Prairie Swine Centre undertook quite an extensive workload to meet project objectives and make the initiative a success. The Canadian Swine Research Lead User Project built upon the Swine Cluster 1 Research Program results and encouraged their uptake in swine operations across Canada.

This project involved the participation of more than 215 individuals from the Canadian swine sector in seven provinces.

A series of four workshops on sow lameness took place in Manitoba, Ontario, Québec and New Brunswick. These workshops brought together funders and stakeholders on the issue of sow lameness, specifically changes in sow housing requirements for the next decade. A total of 114 participants attended the four workshops. Satisfaction was rated excellent, with 100% of attendees saying they would recommend this workshop to a colleague or customer.

A workshop on nutrition was held in Ontario in February 2014. It brought nutritionists and producers together to collect further information directly from the researchers for these topics. A simultaneous webcast of the workshop was available for those unable to attend in person.

The project increased the rate at which technology is incorporated into the commercial swine industry, thanks largely to lead-users, direct contacts between researchers and users, and tools for users. It successfully identified lead-users and brought technologies such as the Zephyr non-penetrative captive bolt and lameness assessment into Canadian barns. Finally, a tool was developed to enable transportation companies and producers to install a sprinkling system on their vehicles.

There were several other communications throughout the year with Board members, stakeholders, researchers and AAFC staff.

## Corporate activities

Although the new research program was not made official before January 2014, follow-ups, knowledge transfer and corporate activities had to be maintained. To this end, the Centre de développement du porc du Québec inc. was asked to provide these services under a special budget. A number of meetings were then held to comply with the strategic objectives of the Board of Directors.

Throughout the year, the Management team handled the preparation and coordination of one Annual General Meeting, four Board of Directors meetings, and several committee meetings: one Audit and four Executive meetings.

## Conclusion

This year (2014-2015) will be devoted to launching Swine Cluster 2, while researchers will begin work on novel technologies that should generate results for the entire Canadian pork industry. Communication will also be at the forefront, with regular newsletters and face-to-face meetings.

Since our transfer of knowledge activities did not receive the anticipated financial support, we are looking to prepare a plan that will instigate partnerships and seek new sources of funding. Swine Innovation Porc is committed to ensure that technologies of interest are used by producers and bring about sound returns at the farm level.

It is now three years since Swine Innovation Porc was set up; now would be the right time to put a new business model into place, a business model that will meet our corporate objectives and enable us to grow according to sustainable development criteria.

Finally, I would like to personally thank each and every member of the management team. Through your dedication and determination, you have contributed to the success of this past year.

On behalf of the entire staff of Swine Innovation Porc, I would also like to highlight the commitment and much appreciated guidance of the Board of Directors. In particular, I would like to stress the vision and ready availability of our Chair, Stewart Cressman, the Vice-chair Normand Martineau and the Treasurer, Neil Ketilson.

The Management Team is determined to continue working with thoroughness and perseverance toward the goals of the corporation and the current research program.



**Pierre Falardeau**  
General Manager

# STRATEGIC PLAN 2013-2018

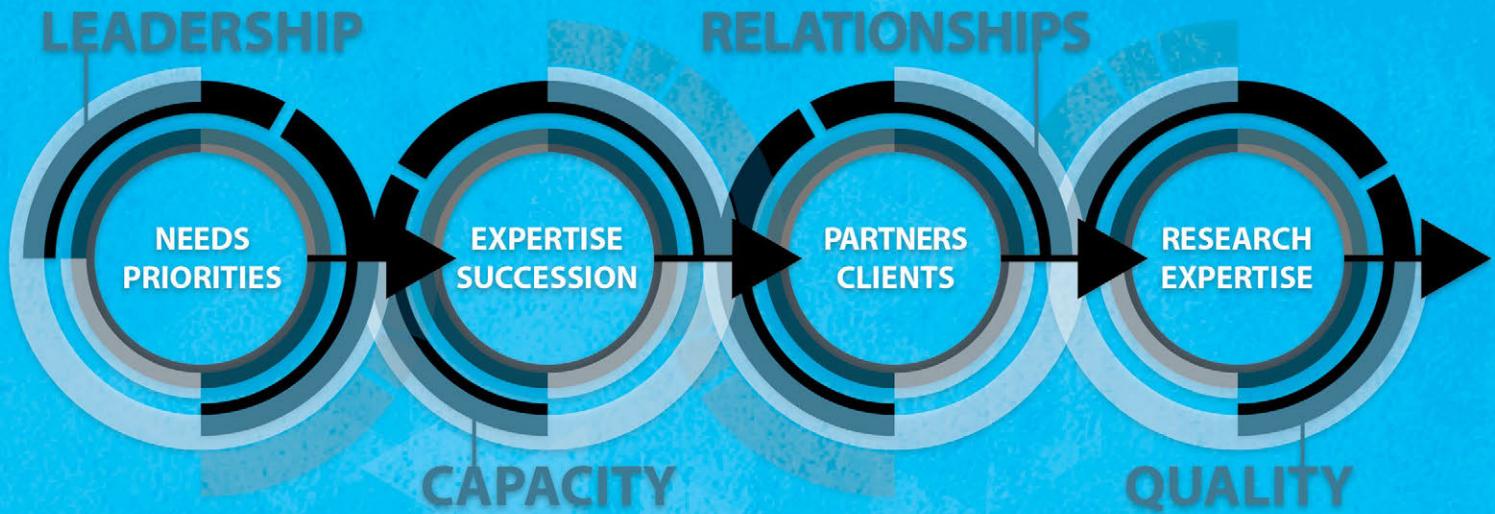
## OUR VISION

**Swine Innovation Porc increases Canadian swine industry competitiveness through a national R&D structure**

## OUR MISSION

**Swine Innovation Porc is committed to provide national leadership in coordinating and facilitating research, knowledge transfer and commercialization initiatives to enhance the competitiveness of the Canadian swine industry**

# Strategic Orientations



## Strategic Initiatives



# RESEARCH



# CH 8GRAM

The year 2013-2014 marks the start of Swine Cluster 2 and a new research program, **2013-2018 Driving Results Through Innovation.**

Swine Cluster 2 comprises 15 research projects conducted by 27 researchers from 13 Canadian institutions, with a greater number of collaborators. These projects are to focus on two main themes:

- Reduction of production and feed costs
- Improvement in product attributes and increased prices

Summaries of these projects follow. ►





# Optimizing Flooring and Social Management of Group Housed Gestating Sows

► Laurie Connor, University of Manitoba

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.

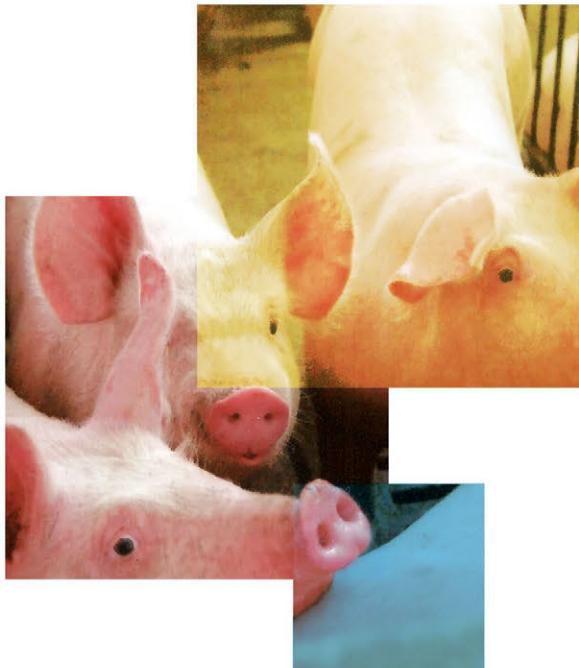
## Summary

The immediate, as well as the long-term outlook for swine production means that producers will have to learn how best to manage group housing of sows.

To support them in this process, this project will determine the most effective slat and gap widths of flooring for sow group housing systems, taking into consideration both the comfort of the sow and ease of manure management.

Researchers will study the effect on reproductive performance and sow herd productivity and welfare of grouping sows at different times following weaning in three different housing and management systems. They will also calculate the production costs and benefits that accrue from grouping sows at weaning in the three management systems.

In addition, researchers will identify and develop suitable and sustainable environmental enrichment for sows housed on slatted floor systems.



## Collaborators

**Derek Brewin**  
**Qiang Zhang**

**Jennifer Brown**  
**Yolande Seddon**

**Nicolas Devillers**

University  
of Manitoba

Prairie  
Swine Centre

Dairy and Swine Research  
and Development Centre, AAFC

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

- Denise Beaulieu, Prairie Swine Centre
- Chantal Farmer, Dairy and Swine Research and Development Centre, AAFC

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.

## Summary

Sows do not produce enough milk to sustain optimal growth of their piglets; a problem exacerbated in recent years with hyperprolific sow lines.

### In this project, researchers will develop:

- feeding and management strategies that will stimulate mammary development of gilts, and increase milk production. Researchers will determine the impact that body condition (i.e. backfat thickness) in gilts at mating and at the end of gestation has on mammary development at the end of gestation. The aim is to determine possible involvement of specific genes on the effect of body condition on mammary development.
- novel management strategies using naturally-occurring bioactive feed compounds (such as the phytoestrogen genistein, and the plant extract, silymarin).
- low-cost feeding strategies for group-housed gestating sows (use of high-fibre, low cost by-products, processing) to reduce aggression and maintain optimum production.

Researchers will also study how to prolong the colostral phase in early lactation in order to increase uptake of immunoglobulins and other growth factors by piglets.

## Collaborators

**Jennifer Brown**

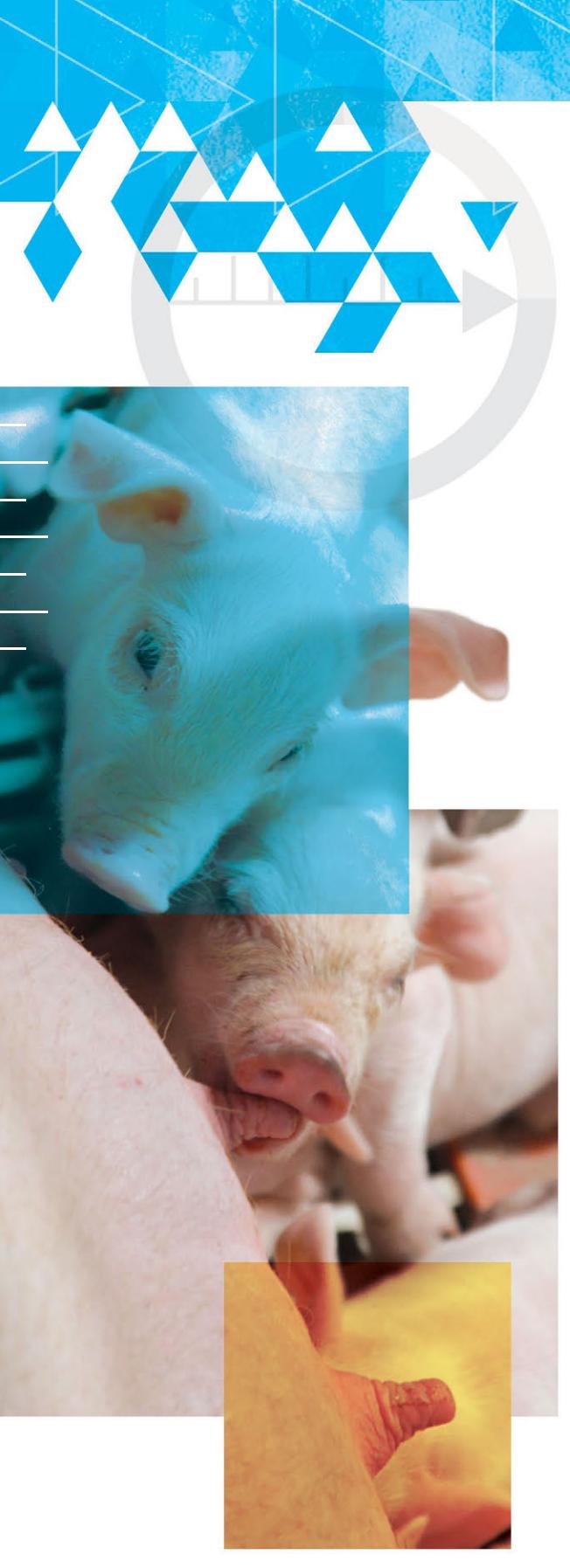
Prairie Swine Centre

**Jérôme Lapointe  
Marie-France Palin**

Dairy and Swine Research  
and Development Centre, AAFC

**Tom Scott**

University of Saskatchewan



# Determining the Optimum Space Allowance for Nursery Pigs

► Jennifer Brown, Prairie Swine Centre

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.

## Summary

The quantity of space provided substantially affects pig welfare by influencing behaviour, stress and social interactions, and has significant economic impacts on productivity and the total pig throughput possible on a farm. While significant research results on the effects of space allowances in grow-finish pigs are available, very little is known in nursery pigs.

In this project, the researchers will:

- determine the effect of space allowance at two group sizes on nursery pig growth, feed efficiency and health, and investigate any interaction with season;
- determine the effect of space allowance on behaviour, in particular the amount of space required to accommodate normal resting postures;
- use break-point analysis to identify the minimum space allowance giving maximum average daily gain for nursery pigs in commercial farms;
- carry out an economic analysis incorporating pig performance and housing cost to identify the most cost- effective strategy for managing the space allowance of nursery pigs on commercial farms.

## Collaborators

**Denise Beaulieu  
Yolande Seddon**

**Dan Bussières**

**Sandra Edwards**

Prairie  
Swine Centre

Groupe Cérès inc.

Newcastle University, United Kingdom

# National Sow Housing Conversion Project

► Jennifer Brown, Prairie Swine Centre

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.

## Summary

Over 96% of Canada's 1.29 million sow herd is still managed in gestation stall housing, Canadian producers will need a reference tool to transition toward group housing management of swine barns.

To develop this reference tool, the main activities of this project are:

- establishment of a national working group
- development and dissemination of group housing factsheets in French and English through the partner websites
- selection and planning of the conversion of four "Lead User" demonstration barns from stalls to group housing for sows: two in Western Canada and two in the East
- documentation of barn conversions at the four commercial sites: information on the barn design, the management and productivity of sows before and after the conversion, and labour and building costs
- Validation of the group housing conversion model developed by the University of Manitoba and implementation of any necessary alterations to refine the model as a tool for barn renovations

Collaborators	
Laurie Connor	University
Qiang Zhang	of Manitoba
Murray Elliott	FGC Groenenstange Construction Ltd
Mark Fynn	Manitoba Pork Council
Sébastien Turcotte	Centre de développement du porc du Québec
Lee Whittington	Prairie Swine Centre



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

- ▶ Claude Gariépy, Food Research and Development Centre, AAFC
- ▶ Brian Sullivan, Canadian Centre for Swine Improvement

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

## Summary

In this project, the levels of functional molecule content in the muscle of Canadian purebred pigs will be quantified.

Deposition of the functional molecule will be studied according to the genetics of the pigs, thus enabling identification of animals with enhanced levels of this molecule.

The functional molecule content will be increased through dietary supplementation in swine feeds: researchers will determine its effects on overall sensory, technical and keeping properties of fresh and chilled pork and processed products.

The functional molecule content of enhanced pork will be compared with current naturally-occurring levels in Canadian pork, beef and poultry and with US pork.

Domestic and export marketing strategies will be developed in light of consumer reactions to pork with enhanced functional molecule content.

Collaborators	
Marie-Ann Binnie	Canadian Pork Council
Frédéric Fortin	Centre de développement du porc du Québec
Ellen Goddard	University of Alberta
Marie-France Palin Candido Pomar	Dairy and Swine Research and Development Centre, AAFC
Jacques Pomerleau	Canada Pork International

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

► Brian Sullivan, Canadian Centre for Swine Improvement

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.

## Summary

To save time and reduce costs, many emerging technologies will be assessed in this project, e.g. systems to record individual water consumption, infrared cameras, accelerometers, near infrared reflectance spectroscopy, etc.

The technologies will be automated (when necessary) and validated to verify if they would be applicable in commercial conditions or research barns. Once automated and validated, the interesting technologies will be used on 2,500 commercial pigs tested across Canada.

### The tested technologies will be used to:

- Objectively assess growth, feed efficiency, welfare, carcass value and meat quality
- Develop affordable, easy to record, objective and accurate indicators of feed efficiency, animal welfare and carcass value
- Assess and compare live-animal and carcass performance
- Compare the impact of various feeding programs, genetics, pen crowding, slaughter weight, light and temperature on growth, feed efficiency, animal welfare, carcass and meat quality

Finally, recommendations will be provided to optimize performance, welfare and carcass value in Canadian pigs.

Collaborators	
<b>Renée Bergeron</b>	University of Guelph, Campus d'Alfred
<b>Nicolas Devillers</b>	Dairy and Swine
<b>Luigi Faucitano</b>	Research and Development
<b>Candido Pomar</b>	Centre, AAFC
<b>Frédéric Fortin</b>	Centre de développement du porc du Québec
<b>Claude Gariépy</b>	Food Research and Development Centre, AAFC
<b>Manuel Juarez</b>	Lacombe Research Centre, AAFC
<b>Jean-Paul Laforest</b>	Université Laval
<b>Michael Ngadi</b>	McGill University

# 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, Dairy and Swine Research and Development Centre, AAFC



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.

## Summary

This study is to evaluate, in warm conditions, the impacts of ventilation, with or without water sprinkling, during the wait before unloading at the abattoir, on the behaviour, physiology, and carcass and meat quality of pigs. In addition, the project will look into the impacts of the level of vibrations during transport to the abattoir, on the posture of the pigs (standing, sitting or lying) in particular. Vehicles will be pot-belly trailers.

### To achieve this, the following aspects will be examined:

- inside the trailer: variations in temperature and humidity and differences in floor vibrations between compartments
- on the animals: variations in body temperature, stress indicator levels in blood, and behaviour during transport, at unloading and in lairage, and animal losses
- on carcass and meat: carcass and meat quality variation and heat stress-related oxidative stability of meat.

## Collaborators

Trevor Crowe

Nicolas Devillers

University of Saskatchewan

Dairy and Swine Research and Development Centre, AAFC

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

- ▶ **Denise Beaulieu, Prairie Swine Centre**
- ▶ **Frédéric Guay, Université Laval**
- ▶ **Kees de Lange, Jim Squires, Julang Li, Niel Karrow, Vahab Farzan and Robert Friendship, University of Guelph**
- ▶ **J. Jacques Matte, Dairy and Swine Research and Development Centre, AAFC**
- ▶ **Martin Nyachoti, University of Manitoba**
- ▶ **Andrew Van Kessel, University of Saskatchewan**
- ▶ **Ruurd Zijlstra, University of Alberta**

**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.**

## Summary

**In this project the researchers will:**

- explore a variety of promising approaches to optimize the gut health, immune and digestive functions of newborn and newly weaned piglets.
- explore approaches to improve the nutritive and health value of low-cost piglet feed ingredients, using approaches such as fermentation and ensiling.
- investigate the effects of combining selected feed additives with low-cost feedstuffs to further support piglet performance and health.
- evaluate promising and complementary feeding strategies in multi-site experiments in research units and commercial swine operations representing all geographical regions. This to achieve cost-effective pork production based on growth performance up to market weight and carcass quality.
- transfer to commercial swine producers “ready-to-adopt” practices based on scientific foundation and commercial demonstration.

## Collaborators

**Nathalie Bissonnette  
Jérôme Lapointe  
Martin Lessard  
Guylaine Talbot**

Dairy and Swine  
Research and  
Development  
Centre, AAFC





# Feeding programs for growing-finishing pigs to enhance global competitiveness: Opportunities across Canada

- Denise Beaulieu, Prairie Swine Centre
- Eduardo Beltranena, Alberta Agriculture and Rural Development
- François Dubeau, Université de Sherbrooke
- Frédéric Guay and Marie-Pierre Létourneau-Montminy, Université Laval
- Martin Nyachoti, University of Manitoba
- Cândido Pomar, Dairy and Swine Research and Development Centre, AAFC
- James Squires, Kees de Lange, Robert Friendship, Julang Li et Ira Mandell, University of Guelph
- Ruurd Zijlstra, University of Alberta

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.

## Summary

Feed cost is by far the greatest cost of pig production (65-70%), and growing-finishing pigs account for around 80% of feed consumed. The continued high costs of feed with peaks in 2012 are evidence of the need to develop cost-effective feeding strategies for growing-finishing pigs.

### During this project, the researchers will work to:

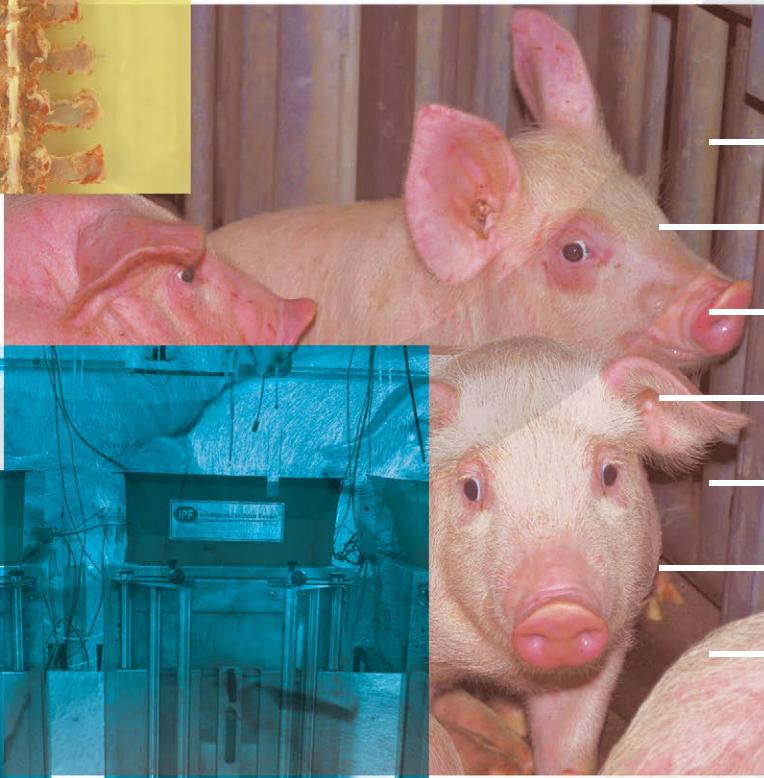
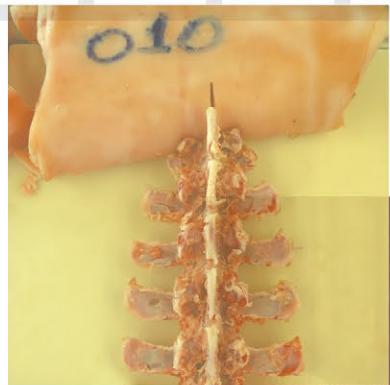
- expand the feedstuff matrix in Canada with new and improved feedstuffs well characterized for inclusion in diets for growing-finishing pigs.
- determine the impact of precision feeding techniques to meet the nutrient requirements of individual pigs on Canadian commercial grow-to-finish operations.
- improve the usefulness of biological models to evaluate the environmental and financial effects of alternative feeding strategies for groups of growing-finishing pigs.
- Conduct growth performance and meat quality studies to validate optimum feeding strategies that vary with pig genotypes, gender, health status, locally available ingredients, and financial conditions.

### Collaborators

Jean-Pierre Dussault

Université de Sherbrooke







# Towards the development of a method for determining the antimicrobial susceptibility of *Brachyspira*

► Joseph E Rubin, University of Saskatchewan

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.

## Summary

The fundamental deliverable of this research is a set of tools that will arm the Canadian swine industry with the necessary information to develop targeted and more effective treatment strategies specific to each disease situation.

There are currently no standardized methods for conducting or interpreting antimicrobial susceptibility tests on *Brachyspira*. Unlike in the United States, Australia and several European countries, there are no published reports describing the antimicrobial susceptibility *Brachyspira* causing disease in swine in Canada. This leaves Canadian swine veterinarians with no *in vitro* evidence to guide their therapeutic selection. Furthermore, the antimicrobial susceptibility of '*B. hampsonii*' strain 30446, a recently-described organism causing disease in Western Canada, has not been published precluding the application of even general organism specific treatment guidelines from other countries. This research will provide the Canadian swine industry with the essential tools needed to effectively combat *Brachyspira*-associated disease, an important threat to the vitality of Canadian producers.

## Collaborators

**John Harding**  
**Janet Hill**

University  
of Saskatchewan

# New tools to enable effective genomic selection for disease resilience

► Graham Plastow, University of Alberta

**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.**

## Summary

Health is an important component of the cost of production; however, it also represents a potential competitive advantage for Canadian pork.

Health is one of the most difficult traits to measure. It is therefore very challenging to breed for improved health using traditional approaches. Genomics offers the opportunity to increase the effectiveness of such efforts and to eventually be able to select for animals that are more resilient to disease.

**To deliver new tools, the main activities of this project are:**

- Identification of new targets for improving the resilience of commercial pigs using samples and data from PigGen Canada, Canadian Swine Health Board, and Genome Alberta projects on swine health challenges. These last-mentioned include Porcine Reproductive and Respiratory Syndrome (PRRS) and Porcine Circovirus Associated Diseases (PCVAD).
- Creation of additional commercial herd datasets to support the validation of genomic tools and the impact of selection for increased resilience.

## Collaborators

**John Harding**

University of Saskatchewan

**Jamie Wilkinson**

University of Alberta

**Benny Mote**

PigGen Canada





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

► Caroline Duchaine, Centre de recherche de l'Institut Universitaire de cardiologie et de pneumologie de Québec- affiliated to Université Laval

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.

### Summary

The PRRS and Influenza viruses and *Streptococcus suis* are associated with elevated morbidity and mortality, reduced performance and increased cost of medication and vaccination in animals, adding to producers' overall financial burden. A Canadian pig producer loses between \$250 and \$460 per sow per year from chronic PRRS and associated acute infection (Mussel, 2010).

To lessen economic losses, this project aims to find ways to combat the penetration of pathogenic agents into swine buildings (laboratory set up). Using a wind tunnel, researchers will evaluate the capture efficiency of various pre-filter and filter combinations for Influenza, PRRSv and virulent *Streptococcus suis* serotype 2 models.

The viral (phage Phi6) and bacterial (*Streptococcus* sp.) models to be used to mimic animal pathogens are not harmful to animals or humans.

Researchers will conduct a literature review in order to select the pre-filters and filters studied, and the atomization and air sampling methods.

### Collaborators

**Laura Batista**

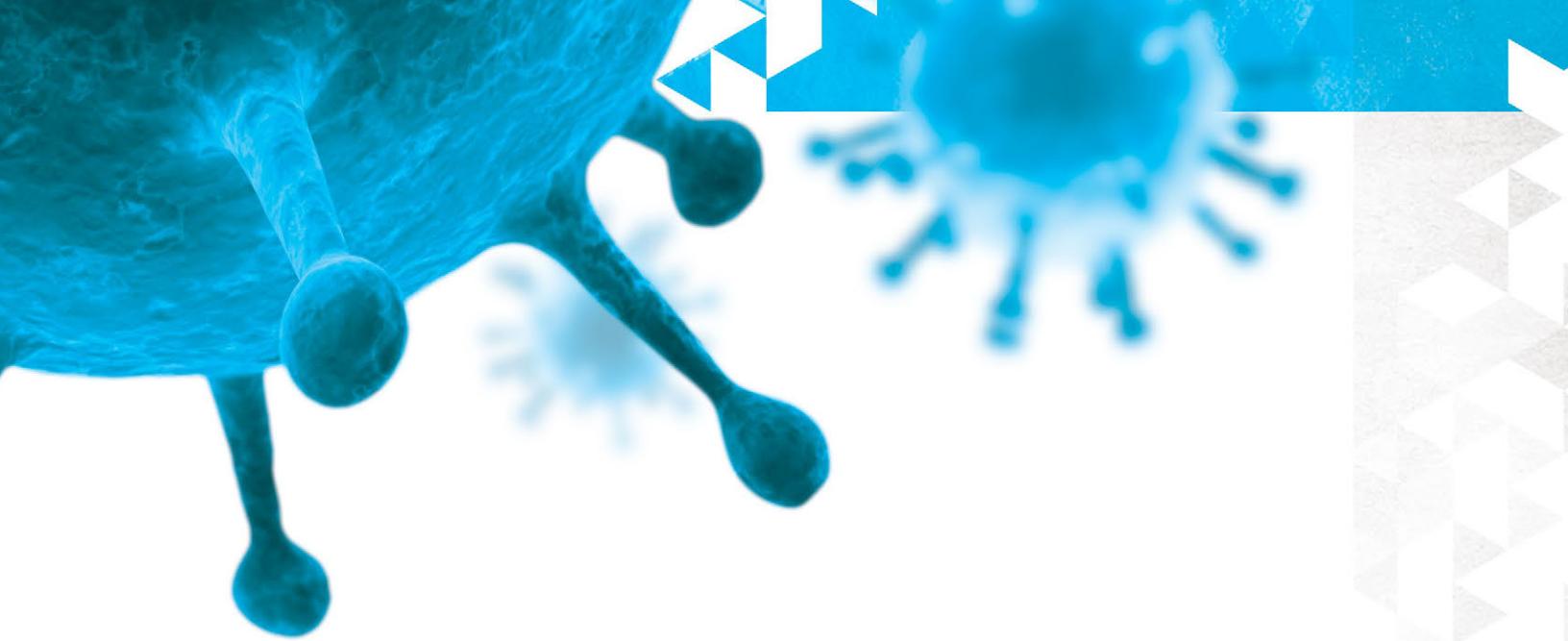
Batista & Asociados

**Stéphane Godbout**

Institut de recherche et de développement en agroenvironnement

**Jacquelin Labrecque**

Centre de développement du porc du Québec



## Dynamics of influenza infection in swine populations

► Zvonimir Poljak, University of Guelph

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.

### Summary

During this project, the researchers will work to:

- determine the whole nucleotide sequence of influenza viruses that currently circulate in swine; this in order to understand large scale trends and the extent of influenza virus variability over time in representative production systems. This work includes:
  - evaluation of patterns of influenza transmission in multi-source all-in all-out nursery herds by barn,
  - evaluation of influenza virus transmission between sows and suckling piglets, and,
  - further assessment of influenza genotypes commonly circulating in swine populations.
- To develop a real-time statistical outbreak detection system, and test various surveillance and sampling systems

### Collaborators

**Rob Deardon**  
**Robert Friendship**  
**Eva Nagy**

University  
of  
Guelph





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

► Yohannes Berhane, National Centre for Foreign Animal Diseases, CFIA

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.

## Summary

The recent 2009 H1N1 flu pandemic that emerged in Mexico highlighted the importance of pigs as intermediate hosts through which avian viruses adapt to mammals before emerging in humans.

During this project, the researchers will develop:

- serological tests for SIV antibody detection and subtyping using the Luminex suspension microarray.
- a single test that will differentiate between antibodies produced in response to SIV vaccination and those produced in response to natural SIV infection.

## Collaborators

**Shawn Babiuk**  
**John Pasick**

**André Broes**

**Davor Ojkic**

National Centre for  
Foreign Animal Diseases, CFIA

Biovet

University of Guelph

# Epidemiology of porcine reproductive and respiratory syndrome virus (PRRSv) among swine herds, an applied research program supporting PRRS control projects

► Sylvie D'Allaire, Université de Montréal

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.

## Summary

Researchers will:

- evaluate the various algorithms available for classifying PRRSv strains into genetic clusters so as to identify the most likely source of recent herd contamination from sequencing data gathered in the field.
- assess the spatial and temporal dispersal of PRRSv strains based on sequences and compare the results for the areas with and without PRRS control projects.
- develop a methodological approach that is based on sequences and epidemiological data for evaluating the most likely source of virus introduction (e.g. same animal source, sharing of employees, airborne transmission, etc.) into a herd.
- develop an interactive automated mapping system based on the above approaches. This system would integrate sequences and search for epidemiological and spatial connections between infected farms, which can then be applied at the farm level to find the potential source of any new strain introduction.

## Collaborators

**Julie Arsenault**

**Marie-Ève Lambert**

**Zvonimir Poljak**

Université  
de Montréal

University of Guelph



# Canadian Swine Research Lead User Project

► Helen Thoday, Prairie Swine Centre

This project aimed to build upon the Swine Cluster 1 research program, by accelerating the rate of adoption of new technologies to enhance pork industry competitiveness throughout Canada.

The Canadian Swine Research Lead User Project comprised 4 sub-projects:

- Development of novel feeding strategies
- Assessment of sow lameness, longevity and temperament
- Evaluation of water sprinkling during transport
- Evaluation of the non-penetrating captive bolt for euthanasia

All materials produced through this project, including videos, presentations, user guides, factsheets, interviews, etc., are available at:

[www.prairieswine.com/feed-efficiency-webinars](http://www.prairieswine.com/feed-efficiency-webinars)

The final report is available in the Publications section of our website:

[www.swineinnovationporc.ca](http://www.swineinnovationporc.ca)





## Speakers and Organizer of the Sow Lameness, Longevity and Temperament Workshops

### Nicolas Devillers

Dairy and Swine  
Research and  
Development  
Centre AAFC

### Yolande Seddon

Prairie Swine  
Centre

### Laurie Connor

University of  
Manitoba

### Jennifer Brown

Prairie Swine  
Centre

### Helen Thoday

Prairie Swine  
Centre

### John Deen

University of  
Minnesota

### Collaborators

**Ken Engеле**

**Marie Vachon**

Prairie Swine Centre

Swine Innovation Porc

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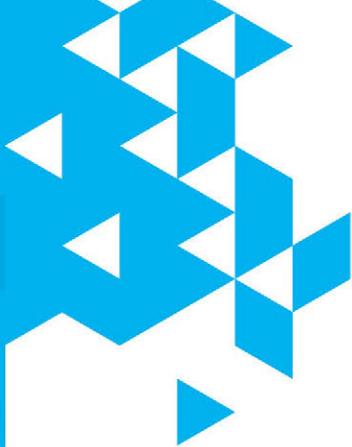
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