

ANNUAL REPORT

2020
2021

INNOVATING
FOR A STRONGER
PORK SECTOR



Swine Innovation Porc



Swine Innovation Porc

Science into Practice

swineinnovationporc.ca

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BOARD OF DIRECTORS 2020-2021



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Chair of the Science
Advisory Body

MESSAGE FROM THE CHAIR 2020-2021



If the COVID-19 pandemic has taught us anything, it is that flexibility and resiliency are essential for getting through tough times. The Canadian pork industry has certainly faced direct impacts due to the pandemic, but the sector has very much shown how it is capable of getting through intense challenges and can continue to be competitive and sustainable.

The pandemic has also highlighted the importance of how scientific knowledge can help combat challenges. This is something that Swine Innovation Porc takes to heart in terms of putting science into practice, all to give the industry the tools and knowledge to stay competitive, resilient, and be even stronger.

Even in the midst of COVID-19, we at Swine Innovation Porc have been fortunate to report successes over the last year. For example, we greatly welcomed the announcement at the end of 2020 that the Pork Promotion and Research Agency would be implemented.

Through a collection of levies, this agency is planned to support activities in research and promotion, which is great news for the swine sector. Swine Innovation Porc looks forward to assisting the agency to deliver industry-driven research initiatives.

Also, our portfolio of research projects currently underway reflects a diverse and wide range of science that is results driven. Pages 8 and 9 of this report provides highlights from several projects that demonstrate this diversity: from a project looking at the development of an oral fluid test to detect African swine fever, to another examining sow mortality, as well as several nutrition projects looking at providing tangible solutions to optimize performance and reduce feed costs across production stages. We are proud to support this caliber and variety of research and we are looking forward to seeing their results.

As always, creating new partnerships and maintaining existing ones is key to the success of our organization. This past year, consultations have begun with partners in industry, research community and the public sector to help identify the industry's most pressing challenges and what research is needed to address those priorities. Prioritizing and communicating research objectives is a major pillar of our strategic plan, and the consultation is a great example of how we at Swine Innovation Porc can serve the industry. The results of the consultation will of course be available over the coming months.

We want to thank our partners in the private sector as well as the Minister of Agriculture for their continued support towards research. Our research programs would not be possible without the research community, who has shown over the past year its capacity to adapt and deliver, even in times of such uncertainty. I want to sincerely thank our Management Team and Board of Directors as well for their dedication and ability to adapt to a challenging and quickly changing situation.

Yours sincerely,

A handwritten signature in dark ink that reads "Stewart Cressman". The signature is fluid and cursive, written in a professional style.

Stewart Cressman
Chair



MANAGEMENT REPORT 2020-2021

Even as the past year has been marked by challenges due to the global pandemic, Swine Innovation Porc is pleased to report that all of our supported research activities have been continuing and, in general, will be completed as planned. Early on in the pandemic, we were able to quickly move many of our activities online and almost seamlessly continue facilitating research, as well as enhancing coordination between and among researchers and the industry.

As for our \$18.5 million Swine Cluster 3 research program, which includes 14 main projects as well as a significant knowledge transfer component, the third year of the program has been completed and we look forward to seeing results from projects in 2023.

While public health measures had temporarily shut down many research activities taking place in barns and labs across the country, by working closely with research leaders, some minor adjustments were made to allow projects to be able to deliver results on time. All of this has been made possible through not only this great collaboration with the scientific community, but also through the understanding of our partners at Agriculture and Agri-Food Canada, who have allowed greater flexibility within Swine Cluster 3 due to the pandemic.

While the majority of our supported projects are included within the Cluster program, we have been working hard at expanding our research portfolio. Over the past year, we have been proactive in seeking relevant project ideas on the following themes:

- Improving swine welfare in Canada
- African swine fever: Prevention and mitigation



The retained project ideas will be included in applications to various funding agencies. These two calls for proposals are excellent examples of our commitment to maximize funding towards relevant research projects that will provide answers to the industry's most pressing questions.

We have also been very active this past year in developing our communications and finding new ways to reach our partners in the swine sector. For the first time, we launched a student poster competition as well as a webinar series on swine research. We look forward to building on the success of these new events and will continue to deliver similar ones in the future. More information about these events may be found on pages 20 and 21 of this report.

This past year has really shown that collaboration and reaching out to each other is really a key path to success. Thank you again to our partners in industry, government and the research community. It will be a pleasure for us to see you all again - in person - as soon as COVID-19 is behind us.

Yours sincerely,

A handwritten signature in black ink that reads "Abida Ouyed". The signature is fluid and cursive.

Abida Ouyed
General Manager

An abstract geometric composition featuring various shades of red and pink. The design includes a large circle with a white outline and a solid dark red quadrant. A thin white line passes through the center of this circle. Several smaller circles and dots are scattered throughout the composition, some connected by thin white lines. A grid of dots is visible in the upper right quadrant. The overall aesthetic is modern and minimalist.

RESEARCH AND DEVELOPMENT

SWINE CLUSTER 3 INNOVATING FOR A STRONGER PORK SECTOR

Swine Cluster 3 is a five-year research program (2018-2023) that includes 14 primary R&D projects within five main research areas:

- Animal health
- Animal nutrition
- Animal welfare
- Environment
- Pork quality

The program also includes a significant knowledge transfer component dedicated to communicating results to end users through on-farm demonstration and various communication activities.

Swine Cluster 3 is designed to:

- Accelerate the pace of innovation
- Drive sustainable growth
- Strengthen competitiveness and maximize the resilience of the swine sector

Total budget

\$18.5M

\$12.7M

Agriculture
and Agri-Food
Canada

\$5.8M

Producers
and Industry

+80

RESEARCHERS

14

PRIMARY PROJECTS

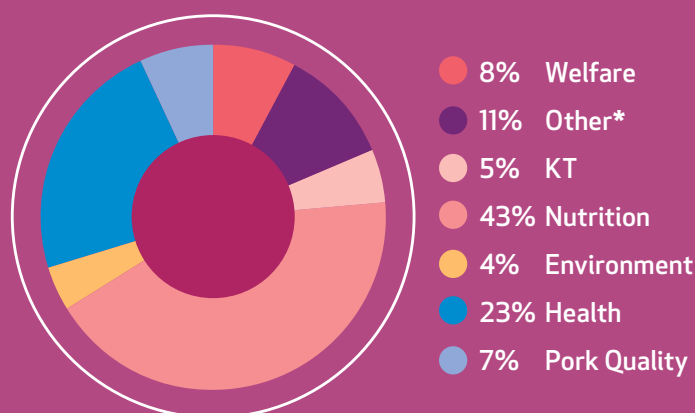
+50

PRIVATE
PARTNERS
(including
provincial pork
organizations)

24

RESEARCH
ORGANIZATIONS
ACROSS CANADA
AND AROUND
THE WORLD

Allocation of funding



* Includes coordination and fees related to managing the program

SWINE CLUSTER 3

ONGOING PROJECTS

2018-2023

The following projects began in 2018 and the majority of projects will wrap up in 2023. Results will be communicated as they become available, but in the meantime, please click on each project title or visit our website to read fact sheets on each project.

ANIMAL HEALTH

Improved Biosecurity in the Canadian swine Transport Industry – Phase 3

Led by Terry Fonstad, University of Saskatchewan

Improvement of therapeutic and prophylactic measures against porcine reproductive and respiratory syndrome (PRRS) virus through the discovery of antiviral drugs and the use of antimycotoxins

Led by Carl Gagnon, University of Montreal

Pig Gut microbiome project – Characterization of the core gut microbiome associated with pig health and performance: towards fecal diagnostics and microbiome therapy

Led by:

Vahab Farzan, University of Guelph

Andrew Van Kessel, University of Saskatchewan

Ben Willing, University of Alberta

Survivability and infectivity of PED virus in soil

Led by Mario Tenuta, University of Manitoba

ANIMAL NUTRITION

Towards a new feeding approach of neonatal and weanling piglet for optimizing nutritional status, immunity and microbiota and minimizing the use of antibiotics

Led by:

Frédéric Guay, Laval University

Dominic Poulin-Laprade, AAFC (Sherbrooke)

Innovative micronutrient strategies for maximizing piglet's robustness and performance during the pre- and post-weaning periods

Led by Jérôme Lapointe, AAFC (Sherbrooke)

New feeding and management strategies for replacement gilts that will maximize future milk yield

Led by Chantal Farmer, AAFC (Sherbrooke)

Development of novel feed additives to replace antibiotics and promote pig gut health (2 subprojects)

- Biological roles and efficacy of alkaline phosphatases (AP) for improving gut health, growth performance, physiological endpoints and gut microbiome in the weanling pig

Led by Ming Fan, University of Guelph

- Use of newly selected probiotic bacteria to control enteric infections and improve gut health and performance of piglets

Led by:

Joshua Gong, AAFC (Guelph)

Chengbo Yang, University of Manitoba

Development of innovative strategies to reduce feed costs in the post-weaning period while maintaining optimal performance and health (3 subprojects)

- Examination of the effectiveness of provision of functional amino acids to enhance pig robustness

Led by:

Dan Columbus, Prairie Swine Centre

Vahab Farzan, University of Guelph

Martin Nyachoti, University of Manitoba

- Strategies for detoxifying vomitoxin (DON) using innovative chemical and biological approaches in post-weaning piglets

Led by:

Joshua Gong, AAFC (Guelph)

Chengbo Yang, University of Manitoba

- Pulse grains and organic acids to control growth performance and health of young pigs

Led by Ruurd Zijlstra, University of Alberta

Reducing feed cost and the environmental footprint and enhancing global competitiveness of Canadian pork production by increased nutrient utilization of feedstuffs fed to growing-finishing pigs (5 subprojects)

- Nutritive evaluation of Canadian feed crops and their co-products for swine diets.

Led by Ruurd Zijlstra, University of Alberta

- A comparison of key methodologies used to quantify protein quality in mammals: Ileal digestibility, indicator amino acid oxidation, and in vitro digestibility.

Led by:

Dan Columbus, Prairie Swine Centre

Martin Nyachoti, University of Manitoba

Kate Shoveller, University of Guelph

- Biological roles and efficacy of novel processive cellulase and exogenous alkaline phosphatase for improving feed utilization efficiency and reducing the environmental footprint in growing-finishing pigs

Led by Ming Fan, University of Guelph

- Improving nutrient value of soybean meal using characterized novel microbial fermentation

Led by Julang Li, University of Guelph

- Improve the nutritive value of Canadian feed crops and co-products for swine diets

Led by:

Martin Nyachoti, University of Manitoba

Ruurd Zijlstra, University of Alberta

ANIMAL WELFARE

Effects of long-distance transport on the health and welfare of early weaned pigs

Led by Jennifer Brown, Prairie Swine Centre

Optimizing sow productivity and management: Impact of grouping practices on sow reproductive performance and piglet development and identification of risk factors for sow mortality

Led by Jennifer Brown, Prairie Swine Centre

ENVIRONMENT

Advancing the Canadian swine sector through environmental footprint analyses

Led by Mario Tenuta, University of Manitoba

PORK QUALITY

Classifying Canadian pork based on quality attributes

Led by Manuel Juarez, AAFC (Lacombe)

PROJECTS IN KNOWLEDGE TRANSFER

Enhancing the value of swine cluster research through on-farm demonstration

Led by:

Ken Engele, Prairie Swine Centre

Geneviève Berthiaume, Centre de développement du porc du Québec

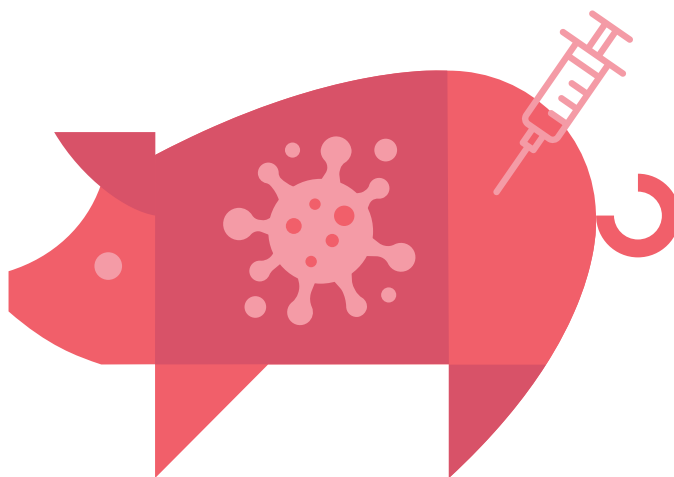
Survey study of small swine producers on their knowledge and application of biosecurity practices for the prevention of disease

Led by Murray Pettitt, Prairie Swine Centre

Porcine epidemic diarrhea virus viability during manure storage in Alberta

Led by:

Javier Bahamon, Alberta Pork



EXPANDING OUR RESEARCH PORTFOLIO

While the Swine Cluster program continues to be a major focus of our activities, we are always striving to find new ways to support projects that will address the industry's needs. The following projects are ongoing and are due to be completed by 2023:

Novel vaccine design as an alternative to antimicrobial use for preventing and controlling the swine and zoonotic agent *Streptococcus suis*

*Led by Marcelo Gottschalk, University of Montreal
Funding provided by AAFC'S AgriScience-Project program and industry partners*

Develop tools required to minimize losses to the swine industry in the event of an African swine fever (ASF) outbreak in North America

*Led by Aruna Ambagala, Canada Food Inspection Agency
Funding provided by Swine Innovation Porc and partners*

RESEARCH HIGHLIGHTS

You will find below highlights from selected projects currently underway within our supported research portfolio. Complete research results from these projects will be published in our 2023 annual report.

WELFARE

Science Takes Aim at Sow Mortality

While there are a host of strategies to enhance swine performance, they all have one catch: they only work on live animals. While the pork industry has made huge strides when it comes to replacement of crates with group housing and genetic advances in productivity, it appears to have taken a step back in the area of sow longevity. Addressing the latter trend while boosting productivity is the focus for Dr. Jennifer Brown and her project “Optimizing sow productivity and management: Impact of grouping practices on sow reproductive performance and piglet development and identification of risk factors for sow mortality”.

The trend towards greater mortality in sows has wide repercussions on farm. Not only is it hard on the employees that must deal with losing more sows, but it can also devastate producers that feel the impact on their wallets. To find answers, researchers sent a survey to all pork producers in Canada and visited a number of pig farms. In both cases, the goal was to identify why sows died or had to be culled.

Unfortunately, the survey’s response rate was quite low due to a combination of factors including the manner of distribution, survey length and the fact that its rollout coincided with the onset of the COVID-19 pandemic. The pandemic also presented a challenge to the initial plan of visiting 40 farms from the producer survey to confirm survey measures, measure sow welfare and demonstrate on-farm autopsy procedures. Thanks to COVID-19,

research travel was restricted to one person per car and no interprovincial travel, and most commercial farms were closed to visitors to protect farm workers.

Rather than be discouraged by this hurdle, the scientists have developed an alternate strategy, requesting sow removal records (including culling, euthanasia and spontaneous death) from surveyed farms, as this data can be obtained from production records without requiring a site visit.

Initial survey results indicate that larger herds had higher sow mortality rates, a result that agrees with previous studies on US and European herds. Another interesting

PROJECT

**OPTIMIZING SOW PRODUCTIVITY
AND MANAGEMENT: IMPACT
OF GROUPING PRACTICES ON SOW
REPRODUCTIVE PERFORMANCE AND PIGLET
DEVELOPMENT AND IDENTIFICATION
OF RISK FACTORS FOR SOW MORTALITY**

Led by Jennifer Brown, Prairie Swine Centre

Results expected
in 2023

finding is that mortality levels were lower in barns with stall gestation than those that employed group housing. This may be a result of producers' lack of familiarity with group gestation or sows not adapting to the new system, whether due to genetic or management factors. The survey and sow removal data will be evaluated along with farm information/management factors to determine associations and other risk factors related to sow death and removal.

Another part of this project aims to improve sow performance, looking at the practice of dynamic mixing in gestation and the impact of mixing sows at various times. In doing so, they are comparing production measures in a number of mixing scenarios, including static or dynamic groups formed soon after insemination, and static groups

formed 28-35 days following insemination. What is the effect of social status in these groups on reproduction, embryo development and piglet vitality in general?

As with many aspects of life and farming, timing may play a major role in sow mortality. The findings of the project thus far suggest that mixing sows earlier can reduce the number of stillborn pigs compared to mixing 28-35 days after gestation. While they have no firm explanation for this at present, researchers plan to dig further as the study progresses.

Though sow mortality has been deadly to some producers' bottom lines, Dr. Brown and her colleagues hope this project will breathe new life into a critical area of study for the pork sector.



*Members of the research team collecting data from sows.
Photos: Prairie Swine Centre*



HEALTH

Interest in ASF Research Heating Up

In light of the COVID-19 pandemic, “vaccine” is likely the buzzword for 2021. Though science has yet to produce a vaccine for African swine fever (ASF), there is much buzz around studies on how to limit damage from the virus if it reaches Canada. As part of that effort, researchers embarked on the project “Develop tools required to minimize losses to the swine industry in the event of an African swine fever outbreak in North America”, led by Dr. Aruna Ambagala.

As a highly contagious viral disease of pigs, ASF is considered a global animal health priority. Pigs infected with the virus develop high fever, skin discoloration and severe mortality. To make matters worse, ASF is a highly stable virus that can survive in the environment, pig carcasses and pork products for prolonged periods.

Apart from its impact on animals, ASF can have devastating effects on local and international trade of live swine and pork products. Introduction of ASF into Canada or the United States would cost billions of dollars, and the resulting trade restrictions would affect over a hundred thousand farmers and workers.

PROJECT

**DEVELOP TOOLS REQUIRED
TO MINIMIZE LOSSES TO THE SWINE
INDUSTRY IN THE EVENT OF AN
AFRICAN SWINE FEVER OUTBREAK
IN NORTH AMERICA**

*Led by Aruna Ambagala, Canada Food Inspection
Agency Funding provided by Swine Innovation
Porc and partners*

**Results expected
in 2023**

In the absence of treatments or vaccines for the virus, our best chance of eradicating it, while still preserving pork exports from unaffected areas, is a strategy of zoning or compartmentalization combined with active surveillance. Unfortunately, surveillance involving individual pig sampling is labor-intensive and costly, rendering it impractical during a large disease outbreak.

As an alternative to such sampling, pen-based oral fluid (rope) testing is a non-invasive approach that requires far less investment of money and human resources. Collection of oral fluid samples is fast, simple and straightforward. It involves hanging a cotton rope in the pen for 30 minutes, collecting the sample and squeezing the oral fluid into a sterile container.

Against that backdrop, this project aims to evaluate the feasibility of using oral fluid as a potential sample type to detect ASF and to develop portable field tests for the rapid on-site detection of ASF.

Researchers also plan to validate oral fluid detection of ASF in Vietnam, a country where the swine population has been severely affected by ASF. Since the virus was first reported in Vietnam in 2019, it has spread to 61 of the 63 provinces in the country, and over 2.9 million pigs have been culled. In this part of the study, samples will be collected from mid-size family farms/commercial farms affected by ASF. All the samples will be analyzed in Vietnam with a recently developed portable, hand-held, real-time PCR machine that performs as well or better than the complex laboratory-operated PCR instruments. This new portable system can run up to 9 samples at a time and takes only 45 minutes to complete the reaction.

To date, scientists on the study have identified multiple farms in Vietnam affected by ASF and collected 89 whole blood samples from animals, including those that showed clinical signs of the virus and pigs that were perfectly healthy. The samples were tested with the portable PCR machine, and the results were identical to tests run on the same samples in a laboratory setting.

With the large volume of pig movement across the Canada-U.S. border, the stakes are high, but so too are the hopes of researchers that this latest study can make a difference if ASF comes calling.

NUTRITION

Science Quenches Thirst for Milk Research

Of the many irrefutable statements about raising pigs, one may top them all: piglets need milk. It's what helps them grow, thrive and provide the greatest possible return for producers, so milk is clearly a priority for science and industry. With that in mind, researchers are addressing the thirst for knowledge in this area with the project "New feeding and management strategies for replacement gilts that will maximize future milk yield", led by Dr. Chantal Farmer with assistance from Dr. Lee-Ann Huber and Dr. Robert Friendship.

This study was prompted by the limited milk supply that sows are able to provide their piglets. Combined with the increase in prevalence of highly prolific sow lines, these milk shortages are limiting piglet growth and producer profits.

The solution from a practical standpoint is to boost milk production. Since the amount of milk available is largely determined by the quantity of cells that secrete milk at the start of lactation, and stimulating mammary development is the best method of raising that quantity, researchers made mammary development the focal point of their efforts.

Specifically, scientists are looking at how nutrition affects mammary development. To do so, they focus on the two crucial time spans when nutrition can hamper or enhance such development in gilts: from three months of age until puberty, and from 90 days of gestation until farrowing. Since it has already been demonstrated that a 20 per cent reduction in feed intake slows mammary development in the growing gilt, the team is scrutinizing the effect of a lesser feed restriction and greater fiber intake during that early period.

The project takes on added importance given that producers with herd lameness issues will often restrict feed to decrease growth rates and the lameness that results. If it can be shown that a 10 per cent drop in feed intake, or an increase in fiber to dilute the diet, won't decrease mammary development and subsequent milk yield, producers and swine nutritionists will have more options at their disposal.



*Sow mammary glands.
Photo: AAFC Sherbrooke*

At present, diet design for sows centers on growth rate, body condition, and issues with locomotion and puberty attainment. That makes the focus on mammary development a unique aspect of this study, and one that promotes nutritional strategies supporting greater sow milk yield and higher growth rates for suckling piglets.

The main finding from this study regards the benefits of feeding high fibre diets (25 per cent more fibre) or restricting feed by 10 per cent or 20 per cent (when control gilts have a feed intake of 3.5 kg/day) during the gilts' development phase. In both cases, such a change can help control body weight gain and backfat depth prior to breeding, without negatively affecting future lactation performance.

Scientists have also finished their study on the impact of increasing prolactin (a hormone that stimulates milk production after the sows give birth) in growing gilts. Of note, they determined that age is a greater factor than body weight in regard to mammary development timing, especially with the genetic gilt lines presently in use by the pork industry. This discovery could aid in finding the ideal point in time for stimulating mammary development during prepuberty.

PROJECT

NEW FEEDING AND MANAGEMENT STRATEGIES FOR REPLACEMENT GILTS THAT WILL MAXIMIZE FUTURE MILK YIELD

Led by Chantal Farmer, AAFC (Sherbrooke)

Results expected
in 2023

Post-Weaning Nutrition: The Link to Zinc

While humans get nutrition through a balanced diet (along with the odd cheeseburger), the task is more complex with pigs. This is especially true during post weaning, when nutritional stresses, as well as threats from disease and infection, can cause harm to pigs and do damage to the producer's bottom line. Finding feeding approaches that will minimize that harm and enhance performance is the goal of the project "Innovative micronutrient strategies for maximizing piglet's robustness and performance during the pre- and post-weaning periods".

As pressure mounts to avoid or limit antibiotics, producers have substituted zinc oxide in the post weaning period. This can be problematic, as the large amount of zinc used for this purpose is more than pigs can fully absorb, leading to wastage and soil contamination.

Given this reality, and the fact that zinc oxide can no longer be used in Europe as of June 2022, Canadian producers and scientists face some tough questions: What will we do if Canada follows the European example? Does the impact of zinc oxide on piglets justify such a ban? If it does, where we do go from here in safeguarding the pre weaning and post weaning pig?

To find the answers, researchers began by experimenting with different zinc levels (low, medium and high) and assessing the impact on their animals. Since copper is also employed in post weaning diets, the project's next task was to better understand how zinc and copper interact in these diets.

Though the study's primary focus is zinc, there is evidence that vitamin D impacts immune function. As well, nursery and weaning piglets often experience a shortage of this vitamin, as they are not passed along from sow to piglet at the proper levels.

PROJECT

**INNOVATIVE MICRONUTRIENT
STRATEGIES FOR MAXIMIZING
PIGLET'S ROBUSTNESS AND
PERFORMANCE DURING THE PRE- AND
POST-WEANING PERIODS**

Led by Jérôme Lapointe, AAFC (Sherbrooke)

Results expected
in 2023

In any area of research, the query from the public is often a pointed one: "That's great, but does it work in the real world?" This is of paramount importance to the swine sector too, so the last portion of the study takes place in a commercial barn, where researchers will run these tests in a "real world" environment to assess the impact.

To date, the project has run its first two trials to assess the influence of high zinc oxide levels in post weaning diets and the interaction between zinc and copper. Specifically, scientists looked at whether these levels would negatively affect the benefits to piglets of copper, energy metabolism, oxidative stress, immune response and bacterial/metal resistance. Based on initial results, it appears that such a negative impact does exist, a finding that has helped guide the use of veterinary medicines containing high levels of zinc.

Moving forward, producers and industry should be following the results with great interest. Given the banning of zinc oxide in Europe, Canada is faced with some hard decisions, and projects like this can aid in those choices. While the study will provide insights to producers on the implications of high zinc oxide or copper diets for post weaning pigs, it hopes to also offer advice on how to use vitamin D as a replacement for zinc, without resorting to antibiotics.

Research Feeds a Need for Lower Costs

Is feed cost a burden for the pork sector? Did the pandemic disrupt our lives? Some answers are painfully obvious, and the high price of feed is a constant pain for producers. As a line item that comprises 65–70% of a typical farm's budget, feed cost is a primary focus for scientists. One of the latest efforts to address the issue is a study led by Dr. Ruurd Zijlstra and Dr. Martin Nyachoti entitled "Reducing feed cost and the environmental footprint and enhancing global competitiveness of Canadian pork production by increased nutrient utilization of feedstuffs fed to growing-finishing pigs".

While feed cost is the greatest single expense in pig production, about 80% of that feed is consumed by growing-finishing pigs. That fact prompted previous research on employing alternative feedstuffs to reduce costs for these animals, and the current study builds on that work.

Specifically, this project aims to extract more nutrients from those feedstuffs using enzymes and other modern technology. By characterizing the nutritive value of various locally-sourced ingredients, scientists hope to aid in more precise formulation of pig diets. This is an exciting prospect for industry, as it holds the promise of multiple benefits. Apart from the obvious one of lowering feed cost by reducing feed expenditure per unit of lean growth, precise feeding of pigs means less excretion of nutrients like nitrogen and phosphorus in pig manure. The latter benefit promises to lower the pork sector's environmental footprint at a time when the public is demanding more action on that front.

Despite progress in assessing the nutritional value of Canadian feedstuffs, there are still significant gaps, especially for feedstuffs unique to Canada. Consequently, characterization of these ingredients is critical, as fighting high feed cost requires knowledge of the tools at your disposal and how best to deploy them.

For example, Canada is a leading producer of pulse grains such as faba beans, field peas, chickpeas, lentils, and kidney beans. Though this is good news from many respects, including a more diversified crop rotation, pulse grains may possess anti-nutritional factors that could reduce their nutritive value, requiring careful characterization to ensure proper inclusion as pig feed ingredients.


As well, analyzing potential feed ingredients is needed because feedstuffs differ in areas of vital importance for producers and their animals. Current research funded by Swine Innovation Porc has shown that key differences exist among feedstuffs regarding starch digestibility and fiber fermentability.

Since the use of ingredients grown in Canada for swine diets can help mitigate feed cost, it is also crucial to assess the nutritive value of short-season corn and small grains such as oats, triticale, and oilseeds and their co-products.

Like many aspects of life, research efforts have been hampered by COVID-19, and this project is no exception. The pandemic has led to a delay in the study's activities. Since spring 2021, however, work has resumed. Scientists plan to study field peas and lentils, as well as oil seed co-products derived from various oil extraction methods. The team will also be catching up on numerous samples that await their analysis.

As industry works to recover from pandemic challenges, boosting the bottom line becomes more important than ever. Though this study is comprehensive in scope, it is laser focused on one goal in particular: broadening the choice of feedstuffs for growing-finishing pigs to reduce the cost of swine diets for producers and stimulate more flexibility in diet formulation. In the process, researchers also hope to aid companies in better defining and marketing these feedstuffs.

Though all research aims to be relevant, this study is especially timely for the pork sector. COVID-19 may be on the way out, but the need to save on feed cost is here to stay.

A photograph showing several white piglets in a nursery. They are standing on a blue plastic slatted floor. The piglets are huddled together, and their tails are visible. The background is dark and out of focus.

Pigs in the nursery at the University of Alberta.
Photo: Lifang Wang

PROJECT

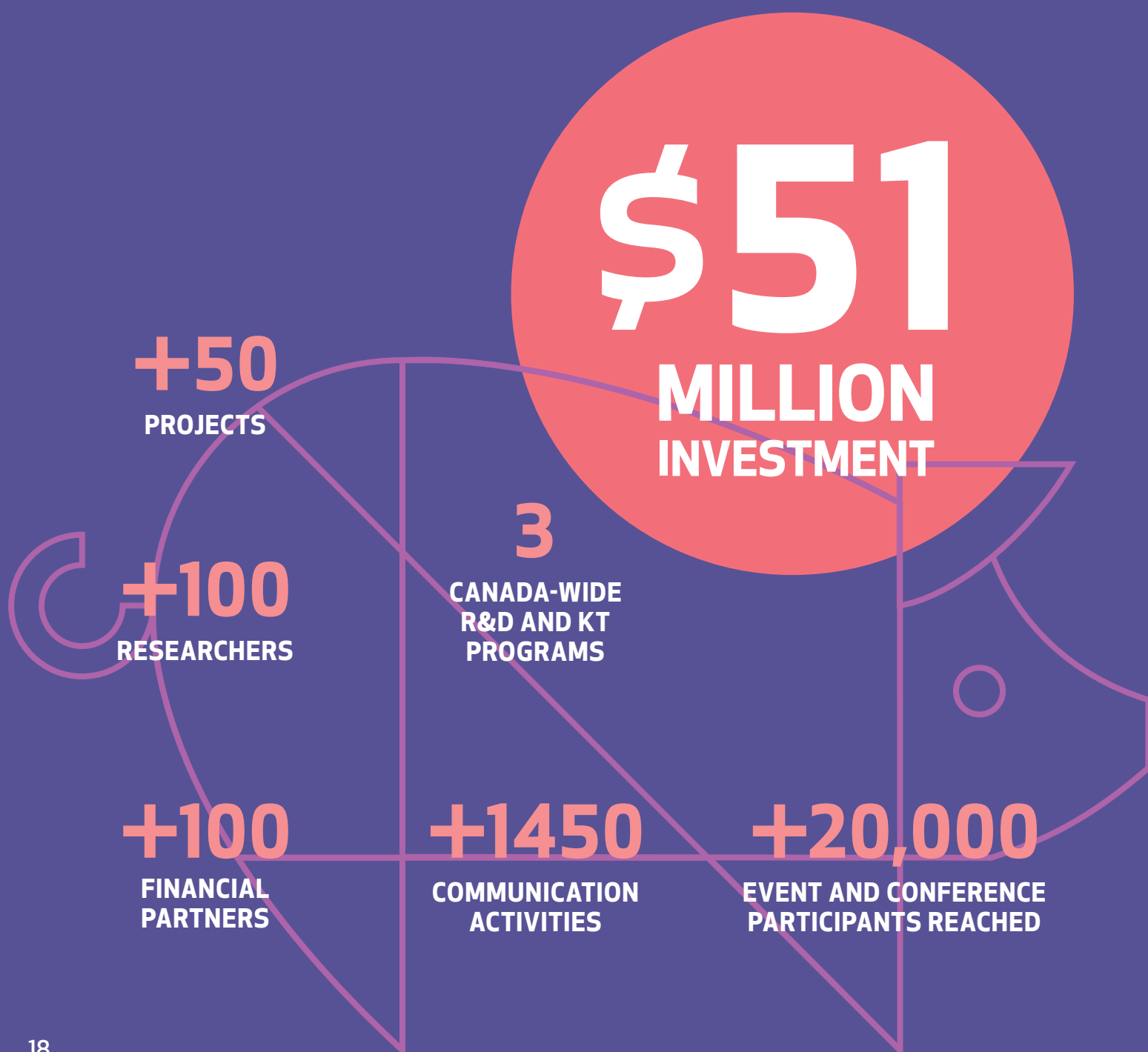
**REDUCING FEED COST AND THE
ENVIRONMENTAL FOOTPRINT AND
ENHANCING GLOBAL COMPETITIVENESS
OF CANADIAN PORK PRODUCTION BY
INCREASED NUTRIENT UTILIZATION OF
FEEDSTUFFS FED TO GROWING-FINISHING
PIGS (5 SUBPROJECTS)**

Led by:
Martin Nyachoti, University of Manitoba
Ruurd Zijlstra, University of Alberta

**Results expected
in 2023**

R&D FROM 2010 TO 2023: A FEW NUMBERS

Since our beginnings in 2010, Swine Innovation Porc has coordinated three national research and development programs, and supported additional projects that address the industry's emerging issues.



Provincial Pork Organizations: Investing in R&D

We are proud to count eight provincial pork producer organizations as members of our organization. Since 2014, these members have been contributing 2.5 cents per market hog to Swine Innovation Porc, which is used to leverage public dollars and multiply investments in R&D that will benefit the industry.

SINCE 2014....

\$4.2

MILLION INVESTED
BY PRODUCER ORGANIZATIONS

\$1

=

FROM PRODUCER
ORGANIZATIONS

USED TO LEVERAGE
AN ADDITIONAL
\$8 DOLLARS
FROM OTHER SOURCES
OF FUNDING
(AAFC + INDUSTRY)



COMMUNICATION & COLLABORATION 2020-2021

Making the move to virtual platforms was a major theme for many of us in 2020-2021. At Swine Innovation Porc, we implemented webinars, virtual events and regular online meetings to ensure regular contact with our partners, as well as ensuring our efforts could continue in getting results out to the industry.

As we move beyond public health restrictions and start to resume in-person events, the lessons learned over the last year will be invaluable in terms of adding the use of virtual platforms along to face-to-face events and meetings.

Read below for more information about what we have been up to in terms of communications over the last year.

SWINE RESEARCH WEBINAR SERIES

Carnosine: What is it and what are the benefits?

Two scientists from the Sherbrooke and Saint Hyacinthe Research and Development Centres presented their latest research on carnosine, a functional molecule that has benefits for not only human health, but also for pork quality.

African swine fever: How is Canada getting prepared?

As the threat of ASF continues to be a major concern for the Canadian pork sector, we held a webinar presenting six industry experts who explained some of the latest actions being taken to prepare and prevent an outbreak of ASF.

Videos of both webinars are available on our website at: www.swineinnovationporc.ca

POSTER SESSION AND STUDENT POSTER COMPETITION

In November and December 2020, in collaboration with the Pork Show, we organized a virtual poster session that highlighted latest research results pertaining to the pork industry. A total of 17 researchers and students across Canada, as well as one from Brazil and another from the United States, submitted posters to the event. For the first time, we awarded cash prizes to the top three posters submitted by students.

Overall, the format of this event provided additional accessibility for the poster session participants, as well as for those viewing the posters. Overall, there were over 3200 visits to the exposition zone where the posters were presented, and oral presentations of the videos were viewed over 400 times.

This type of event really helps to connect the research community with the industry and gives up-and-coming swine professionals real-life exposure to an industry event. We look forward to continuing this collaboration with the Pork Show.

ENHANCING COLLABORATION

Swine Research Centres Group

Since 2017, Swine Innovation Porc has hosted eight meetings to bring representatives together from nine swine research centres across Canada. Over the last year, two virtual meetings were organized to provide updates and share information especially about the challenges the pandemic was having on operations. It was encouraging to hear that while the research centres had experienced various degrees of disruption to their regular activities, the situation had largely stabilized.

Nutrition Networking Meeting

Two virtual meetings were held in January 2021 with researchers involved in nutrition projects that are part of Swine Cluster 3. In total, 14 researchers from institutions across Canada met to provide updates on their work, share information and find solutions to challenges.

ON-FARM DEMONSTRATIONS: PARTNERSHIP WITH CDPQ, PRAIRIE SWINE CENTRE AND ALBERTA PORK

Part of the Swine Cluster 3 research program includes a significant component dedicated to knowledge transfer and ensuring that results of projects reach end users. To help achieve this, we have collaborated with Prairie Swine Centre, CDPQ (Centre de développement du porc du Québec) and Alberta Pork to develop a series of on-farm demonstrations, audits and related knowledge transfer activities. Due to pandemic-related delays, this work will be completed from 2021 to 2023.

COLLABORATION WITH 5MINOFSCIENCE.COM

Finding new ways to reach stakeholders and to foster connections between industry and the research community is a driving goal for us at Swine Innovation Porc. This past year, we started working with the folks at 5minofscience.com who develop concise videos of researchers and experts to profile their work. In 2020-2021, one video was finalized of Dr. Jennifer Brown from Prairie Swine Centre and we look forward to communicating more videos in the future.

You can watch the video by visiting our website at: www.swineinnovationporc.ca



Poster

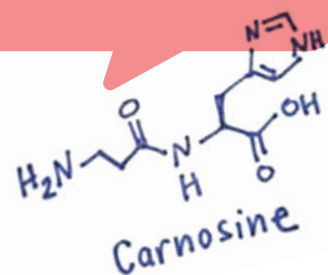
Poster Session and Student Poster Competition
November and December 2020



WEBINAR



AAFC researchers Dr. Claude Gariépy and Dr. Marie-France Palin gave two webinars (one in French and one in English) on December 8, 2020. The title of the webinar was: "Carnosine: What is it and what are the benefits?"



HIGHLIGHTS OF 2020-2021 COMMUNICATION ACTIVITIES

3

Webinars
(+320 attendees)

17

Posters presented during
virtual poster session

32

InfInnovation
electronic ebulletins
communicated

5

Videos uploaded
to YouTube
(616 total views)

16

Featured articles published
by Swine Innovation Porc on
project results and updates

34

Farmscape Online
reports done on
research projects
and Swine Innovation
Porc activities

SERIES



Six experts from various sectors of the industry gave updates on the latest work happening to prepare for and prevent an outbreak of ASF in Canada during our webinar held in January 2021.



ASF Threat Looms Over the U.S. Pork Industry



Cost the pork industry more than
\$50 billion over 10 years



Mean a difference of
\$15 billion in losses versus \$50 billion in losses
for the industry in a scenario where ASF is controlled in two years
versus 10 years



Equivalent to
140,000 job losses in the U.S.
a scenario where it took 10 years to gain control of ASF

Cause hog prices to fall by
47% in the first year of the outbreak
with prices stabilizing at a 30% loss in the 10-year scenario versus
prices starting to climb to baseline levels as soon as pork exports
begin to recover in the 2-year scenario

Reduce pork production by almost
50% in the 10-year scenario
versus a 30% reduction in the industry over the long term in
the 2-year scenario, pending export access is re-established

Swine Innovation Porc

In this webinar, learn about:

- Research gaps in addressing ASF
- How working groups are helping Canada get prepared
- Some latest research in diagnostic testing and emergency euthanasia
- Updates on research from the USA

+10

Number of other media reports
and articles published on Swine
Cluster 2 and 3 research

18

Peer-reviewed
articles related
to supported
research

4

Lead-user sites
to participate
in on-farm
demonstration

3

Major virtual events
and conferences
where Swine
Innovation Porc
was visible:

- Banff Pork Seminar (Alberta)
- Porc Show (Quebec)
- Canadian Society for Animal Science – Swine Symposium (USA)

+45

Number of virtual
meetings where
Swine Innovation
Porc representatives
made presentations
and/or participated

SCIENCE ADVISORY BODY 2020-2021

The Science Advisory Body (SAB) is a committee that evaluates the scientific integrity of research proposals submitted to Swine Innovation Porc. Members of the SAB are recognized professionals who are well-known in their fields and represent a diverse range of expertise within swine research. This committee reviews research proposals, offers scientific expertise, gives technical advice and ultimately provides the Board of Directors with their recommendations.

The following individuals are the current members of the Science Advisory Body:

Andrew Van Kessel

SAB Chair
Associate Director - Research
VIDO (Vaccine and Infectious
Disease Organization)

Tami Brown-Brandl

Professor
University of Nebraska-Lincoln

Patrick Charagu

Senior Geneticist
Hypor

Michael Ellis

Professor
University of Illinois

Dan Hurnik

Chair; Professor, Swine
Health Management
Atlantic Veterinary College,
University of PEI

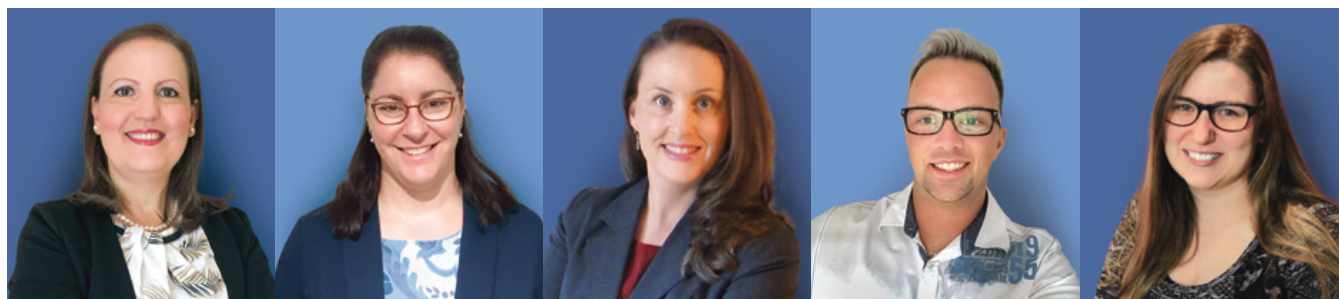
Nathalie Trottier

Professor
Cornell University

Éric Van Bochove

RDT Director
Agriculture and Agri-food Canada,
Sherbrooke & Quebec Research
& Development Centres

MANAGEMENT TEAM



Abida Ouyed

General Manager

Marie Vachon

Research Coordinator

Leslie Walsh

Liaison
& Communications
Officer

Pierre-Dominique Munger

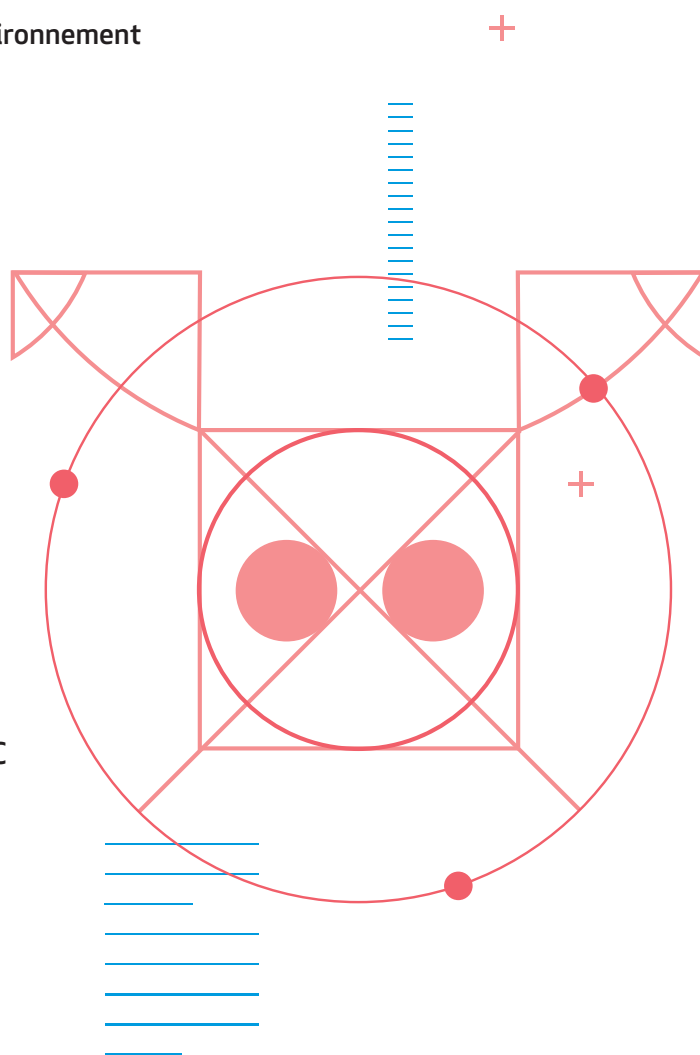
Accounting Assistant

Raine Patrick

Administrative
Assistant

PARTNERS IN RESEARCH

Agassiz Research and Development Centre, AAFC
 Alberta Pork
 Blue Water Wash
 Canada Pork
 Canadian Centre for Swine Improvement
 Canadian Food Inspection Agency
 Centre de développement du porc du Québec
 Centre de recherche en sciences animales de Deschambault
 CEVA Santé Animale
 Guelph Research and Development Centre, AAFC
 HyLife
 Institut de recherche et de développement en agroenvironnement
 Lacombe Research and Development Centre, AAFC
 Lallemand Health Solutions
 Laval University
 Lethbridge Research and Development Centre, AAFC
 Luckhart Transport
 McGill University
 Nutreco
 Olymel
 Ontario Ministry of Agriculture, Food and Rural Affairs
 Prairie Agricultural Machinery Institute
 Prairie Swine Centre
 Prairie Swine Health Services
 Probiotech International
 Semican
 Shandong University
 Sherbrooke Research and Development Centre, AAFC
 Sollio Agriculture
 St-Hyacinthe Research and Development Centre, AAFC
 Transport Genie
 University of Alberta
 University of California
 University of Guelph
 University of Manitoba
 University of Montreal
 University of Saskatchewan
 Utrecht University
 VIDO (Vaccine and Infectious Disease Organization)
 Zinpro



FINANCIAL PARTNERS



Canadian Pork Council
Conseil canadien du porc



FINANCIAL PARTNERS



Canadian Centre for
Swine Improvement



PHARMACOSMOS



FINANCIAL PARTNERS

ORGANIZATIONS COLLABORATING IN CERTAIN PROJECTS

- Agri-Marché
- Avivagen
- Blue Water Wash
- Canada Pork
- Centre de recherche en infectiologie porcine et avicole - Scholarship
- Centre de recherche en sciences animales de Deschambault
- Conestoga Meat Packers
- Elanco
- Government of Saskatchewan
- Greensnow Biological
- HyLife
- ICOR Technology
- Illumina
- Industrial Vacuum Equipment Corporation
- Luckhart Transport
- Prevtex Microbia
- Southwest Ontario Veterinary Services
- Synergy Swine Inc.
- Transport Genie
- University of Montreal - Diagnostic Services, Faculty of Veterinary Medicine
- University of Montreal - Scholarship
- Western Swine Testing Association

