RESEARCH TEAM

RESEARCH PROFESSIONALS

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MAIN PARTNERS

PUBLIC SECTOR

- Canadian federal and provincial departments of agriculture and environment
- International government organizations (United States, European Union, South America)

ECONOMIC SECTOR

- National and provincial producers' federations
- Industry associations
- Private industry

SCIENTIFIC SECTOR

- Canadian, U.S. and international universities

Legend: Bird's eye view of the Dairy and Swine Research and Development Centre

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L'équipe de recherche en production porcine

For more information, reach us at www.agr.gc.ca or call us toll-free at 1-855-773-0241.

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SWINE RESEARCH TEAM

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VISION

To provide swine producers with the technological innovations and know-how to achieve economically viable production of high-quality meat in a way that ensures animal health and welfare, while seeking to reduce their environmental footprint. That is the mission adopted by the swine research specialists of the Dairy and Swine Research and Development Centre.

Guided by that vision, the scientific specialists combine their expertise to advance science and innovation in fields of importance to the swine sector:

- lactation biology
- behaviour and welfare
- immunology and intestinal health
- genomics
- metabolism and nutrition
- metabolism and modelling
- molecular microbiology
- meat quality and animal welfare
- waste management and treatment

They regularly collaborate with colleague researchers at ten or so Agriculture and Agri-Food Canada's research centres across the country.

KEY AREAS OF RESEARCH

BEHAVIOUR AND WELFARE

Propose improvements to good husbandry guides by determining the impact of housing, management and the human-animal relationship on the well-being and behaviour of sows and piglets. To this end, tools to assess the well-being of sows and better knowledge of changes in piglet behaviour are being developed.

❖ Nicolas Devillers, PhD

LACTATION BIOLOGY

Improve suckling piglet growth by developing various strategies aimed at stimulating mammary development in gilts and milk production in sows.

❖ Chantal Farmer, PhD

IMMUNOLOGY AND INTESTINAL HEALTH

Reduce the use of antibiotics by developing feeding strategies that are beneficial to the health and well-being of piglets after weaning.

❖ Martin Lessard, PhD

GENOMICS

Extend the longevity of breeding sows by studying the impact of oxidative stress on their health and reproduction. Develop strategies for optimizing mitochondrial metabolism during gestation and lactation.

❖ Jérôme Lapointe, PhD

Study how genes and nutrients interact in growing pigs (nutrigenomics) and develop genetic improvement tools by identifying key genes associated with carcass quality, meat quality and the development of mammary glands.

❖ Marie-France Palin, PhD

METABOLISM AND NUTRITION

Propose feeding strategies and dietary recommendations for vitamins and trace elements to enhance piglet growth and reproductive performance in sows.

❖ Jacques Matte, PhD

METABOLISM AND MODELLING

Develop sustainable hog production using precision feeding and mathematical modelling techniques to improve the digestive and metabolic utilization of proteins and feed minerals and the accurate assessment of the composition of hog carcasses.

❖ Candido Pomar, PhD

MEAT QUALITY AND ANIMAL WELFARE

Improve meat quality, taste and safety by recommending alternatives to pre-slaughter management that are better suited to hog comfort and well-being, by developing genetic selection and management strategies that focus on greater resistance to stress, by identifying factors that influence the conversion of muscles into meat, and by developing reliable techniques for forecasting variations in animal well-being and meat quality.

❖ Luigi Faucitano, PhD

MOLECULAR MICROBIOLOGY

Reduce the environmental impact of swine production by reducing pathogens and ammonia, odour and greenhouse gas emissions by altering the microbial ecology of the pig digestive tract and the anaerobic degradation in manure pits.

❖ Guylaine Talbot, PhD

WASTE MANAGEMENT AND TREATMENT

Reduce the impact of livestock operations on natural resources through the development of biotechnologies for bioenergy production, the reduction of biological contaminants and the capture and reduction of greenhouse gases, ammonia and odours from farm buildings, manure pits and manure spreading activities.

❖ Daniel Massé, PhD

Promote nutrient reuse (nitrogen, phosphorus, potassium, trace elements) and minimize potable water use through the treatment of slurry and agri-food industry waste.

❖ Lucie Masse, PhD

FACILITIES

The swine complex was built in 1999 and houses a permanent herd of 100 sows.

- Gestation rooms: 4 rooms with pens and cages adapted for taking blood samples and other procedures.
- Farrowing rooms: 4 rooms with a comfort area and 6 rooms with cages spaced to allow movement between the cages.
- Nursery room: 17 rooms, some of which can accommodate up to 12 pens, and a piglet shipment room.
- Semen collection unit: room for housing boars, semen collection room and semen preparation laboratory.
- Growing and finishing rooms: 2 rooms with automated feeding systems and 2 rooms with manual feeding systems. Flexible layout: 32 individual pens or 8 group pens for 12 pigs each.
- Experimental slaughter facility to study pre-slaughter stress and meat quality.
- Meat laboratory separate from the swine complex to measure the influence of production parameters on meat.
- Surgery room for testing surgical techniques aimed at measuring intestinal absorption of micronutrients.

TECHNOLOGY PLATFORMS

The research teams have access to a wide range of equipment for conducting research in fields related to cellular biology and immunology (animal cell culture cabinets, cytometry), genomics and molecular biology (quantitative PCR, DNA sequencer, genotyping, microarray scanner, etc.) and for physical-chemical analyses (nutrient analyzer, gas chromatography, etc.).

SPECIALIZED EQUIPMENT

- X-ray equipment: analysis of the body composition of live pigs.
- Laboratory bioreactor: for the treatment of slurry, manure and other agri-food industry waste and wastewater.
- Olfactometer: objective quantification of odours.

PRACTICES

The development of technologies and best management practices (BMPs) from feasibility studies to scale-up.