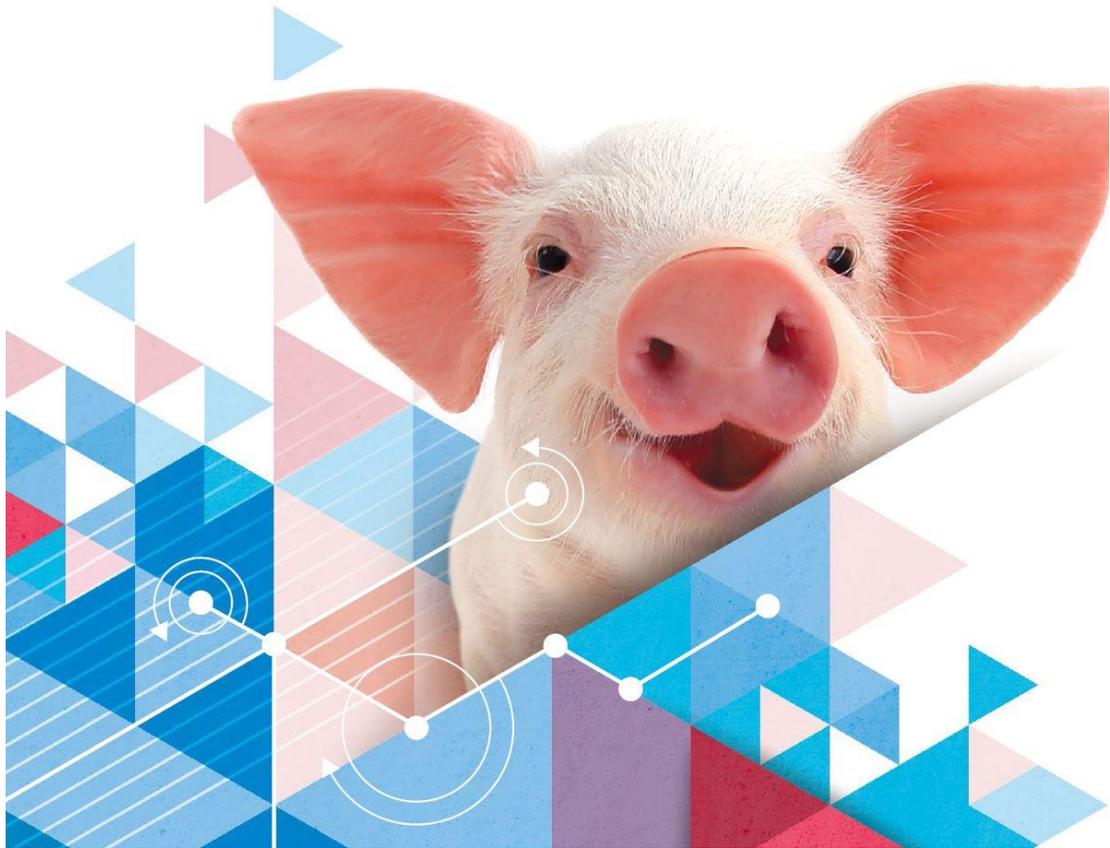


SWINE INNOVATION PORC

Research Priorities

2018-2023



Swine Innovation Porc

1. Responsible Use of Antibiotics

Key words: Immunity, microbiome (transcriptome), vaccines, biosecurity, alternative antimicrobials, causes of antibiotic resistance (AMR), monitoring patterns of antibiotic use (as in Denmark).

Optimize microbiome in baby pigs via dam and progeny
Determine the role of nutrition in optimizing the microbiome and immunity
Develop alternatives to antibiotics such as macrolides, ionophores or antimicrobial peptides
Design on-farm e-data capture to improve and demonstrate responsible antibiotic use

2. Improving Pig Health

Key words: Biosecurity, sanitizers, biofilms, easy-clean coatings, lagoon management, biofilters, feed contamination, soil reservoir, vectors, feral pigs, immunity, viral sequence library, aerosol vaccines, surveillance.

Improve biosecurity on the farm and in transit
Develop more efficient disinfectants and easy-to-clean coatings
Review genetic and nutritional opportunities to increase disease tolerance and immunity
Optimize environment to avoid depressing immunity through stress
Improve intelligence and cross-border risk assessment for emerging diseases

3. Reducing Feed Costs and Improving Feed Efficiency

Key words: Feed crops, nutrient profiles, formulation, precision feeders, toxins, micronutrients, economic systems modelling.

Invite novel approaches to control mycotoxins
Evaluate novel ingredients and alternative feed crops such as pulses, insects and algae
Further develop precision feeding systems and alternative feeding strategies
Optimize formulation of existing ingredients for nutrient profile and low cost
Review opportunities to improve performance through micronutrients

4. Pig Reproduction

Key words: Longevity, metabolic stress, gestation and nursing nutrition, piglet uniformity, mammary development, weaning age, nursery diet, heat detection, semen sexing.

Improve piglet weight, uniformity and viability in larger litters
Optimize energy and amino acid intake during late gestation and lactation, and in nursery
Investigate alternative methods for gender control including low-dose insemination
Review technology to automate heat detection

5. Environmental Sustainability

Key words: Soil microflora, water, greenhouse gases, carbon footprint, odours, dust, endocrine disrupters, biofilters, whole life cycle analysis.

Review opportunities for reduction of swine industry GHG emissions
Conduct whole life cycle analysis of energy and water use, plus undesirable emissions for pork
Review literature on presence of toxic residues in pig meat, feed and manure
Increase the use of manure to replenish soil nutrients and microflora

6. Industry Sustainability and Competitiveness

Key words: Building costs, materials, retrofit, partial outdoor housing, risk management, financing, human resources, robotics, automation.

Develop lower cost and longer-lasting building designs and materials
Invite innovative applications for robotics and emerging technologies in the barn
Encourage training of HQP to ensure succession within the swine science base
Explore opportunities for electronic vertical coordination in the farm to fork value chain

7. International Marketing of Canadian Pork (Confidence in quality)

Key words: Marbling, water-holding, lean and fat colour, pH₂₄, juiciness, texture, flavour, shelf-life, DDGS, “grading” methods, trust, traceability, consumer attitudes and messaging.

Better define meat quality for major markets
Explore new technologies for non-invasive measures of pork quality on the line
Develop separate quality standards for carcasses, primals and individual cuts
Improve the taste and cooking attributes of fresh, chilled and frozen pork
Model the impact of alternative grading systems on profitability

8. Consumer Diet and Health

Key words: Metabolic syndrome (obesity, type 2 diabetes), protein deficiency, glycaemic index, cancer risk, trust.

Determine nutrient profile and health benefits for modern pork
Determine impact of pork on whole meal plate glycaemic index (blood sugar levels)
Collaborate on development of consumer education programs

9. Animal Welfare and Behaviour

Key words: Metrics of stress, gilt training, aggression, castration, tail docking, weaning age, exercise, pen design, enrichment, flooring, ventilation, genotype, transport stress, transit time, truck design, cull sows.

Review European literature and experience on group housing systems
Determine conditions to avoid stressful truck unloading during transit
Optimize gilt training and sow behaviour under new group-housing conditions
Determine best pen designs for modern more sensitive finisher genotypes