University of Guelph / OMAFRA Partnership Pork Research Program Projects

Kees de Lange, Pork Research Co-ordinator, University of Guelph

The University of Guelph/OMAFRA Pork Research Program currently supports 23 research projects. These projects are organized by objectives, which are established based on industry wide consultation and under the direction of the Agricultural Research Institute of Ontario (ARIO). New research proposals and research progress are reviewed annually. Current projects and lead researchers for each project are listed below.
For more information on individual projects visit the OMAFRA website http://www.uoguelph.ca/research/omafra/animals/pork.shtml or contact the lead researcher.

OBJECTIVE 1: STRATEGIES TO ADDRESS ENVIRONMENTAL ISSUES

026015 - The Enviropig: from the research lab to the market place
- J. Phillips, Department of Molecular Biology and Genetics.
026317 - Quantitative representation of nutrient utilization in the growing pig
– C. de Lange, Department of Animal and Poultry Science.
026319 - Determination of dietary true digestible calcium to phosphorus ratio and requirements in weanling piglets (10-20 kg) fed corn and soybean meal-based diets – M. Fan, Department of Animal and Poultry Science.

OBJECTIVE 2: PORK QUALITY AND SAFETY

Goal 2.1. Food safety

026273 - Evaluating effectiveness of interventions against Salmonella in swine using a novel evidence-based tool – S. McEwen, Department of Population Medicine.
026282 - Effect of bacteriophage on the population dynamics of Salmonella within Ontario pig herds – K.Warriner, Department of Food Science.
026301 - Investigating public health risks associated with pork production
– B. Friendship, Department of Population Medicine.

Goal 2.2 Reducing antibiotic use

026282 - Effect of bacteriophage on the population dynamics of Salmonella within Ontario pig herds – K. Warriner, Department of Food Science.
026291 - Genetic markers of infectious disease resistance in Ontario swine
- A. Brooks, Department of Pathobiology.
026301 - Investigating public health risks associated with pork production
– B. Friendship, Department of Population Medicine.
026316 - Production of transgenic pigs that are more resistant to diseases
- J. Li. Department of Animal and Poultry Science.

Goals 2.3 and 2.4. Improving pork quality and uniformity of carcass

026278 - The effects of gender and feeding strategy on pig growth performance and feed digestibility – P. McEwen, Ridgetown College.
026314 - On-farm management strategies to improve handling, reduce stress and enhance meat quality – T. Widowski, Department of Animal and Poultry Science.

OBJECTIVE 3: TO IMPROVE PRODUCTION EFFICIENCY

Goal 3.1. Feeds, feeding and mycotoxins

025997 - Liquid feeding of swine: gut health, food safety, environmental impact and growth performance – C. de Lange, Department of Animal and Poultry Science.

026278 - The effects of gender and feeding strategy on pig growth performance and feed digestibility - P. McEwen, Ridgetown College.

026317 - Quantitative representation of nutrient utilization in the growing pig - C. de Lange, Department of Animal and Poultry Science.

026323 - Effect of Fusarium mycotoxins on performance and metabolism of gestating and lactating sows – T. Smith, Department of Animal and Poultry Science.

026488 - Testing two mycotoxin detoxifiers for ability to make highly infected corn useable for swine – P. Luimes, Ridgetown Campus.

Goal 3.2. Improving pig health

026005 - Enteric disease control in post-weaned pigs – R. Friendship, Department of Population Medicine.

026068 - Modulation of host cell responses by porcine reproductive and respiratory syndrome (PRRS) virus – D. Yoo, Department of Pathobiology.

026291 - Genetic markers of infectious disease resistance in Ontario swine - A. Brooks, Department of Pathobiolgoy.

026316 - Production of transgenic pigs that are more resistant to diseases - J. Li, Department of Animal and Poultry Science.

Goal 3.3. Improving reproductive performance

026289 - Improving swine reproductive performance through improved semen quality and better methods of insemination – R. Friendship, Department of Population Medicine.

026294 - Use of soy liposomes for cryopreservation of boar semen – M. Buhr, Department of Animal and Poultry Science.

026318 - Sexing of boar sperm using single stranded DNA aptamers – S. Golovan, Department of Animal and Poultry Science.

026323 - Effect of Fusarium mycotoxins on performance and metabolism of gestating and lactating sows – T. Smith, Department of Animal and Poultry Science.

Goal 3.4. Transgenics

026036 - Artificial Insemination Mediated Modification of Pig Genome – S. Golovan, Department of Animal and Poultry Science.

026316 - Production of transgenic pigs that are more resistant to diseases - J. Li, Department of Animal and Poultry Science.

OBJECTIVE 4: TO IMPROVE ANIMAL WELL-BEING

026069 - Meeting the needs of ill swine to improve well-being and decrease reliance on antimicrobials - S. Millman, Department of Population Medicine.

026181 - Strategies for reducing aggression in loose housed sows – T. Widowski, Department of Animal and Poultry Science.

026182 - Management practices affecting the behaviour and welfare of piglets - T. Widowski, Department of Animal and Poultry Science.

026304 - Factors associated with transport losses in market weight finisher pigs - C. Dewey, Department of Population Medicine.

026305 - How to sample pig farms to be confident the results are correct when testing for toxoplasma, salmonella, influenza and yersinia – C. Dewey, Department of Population Medicine.

026314 - On-farm management strategies to improve handling, reduce stress and enhance meat quality – T. Widowski, Department of Animal and Poultry Science.

SUSTAINABLE PRODUCTION SYSTEMS RESEARCH PROGRAM

Under the research partnership agreement between The University of Guelph and OMAFRA, pork research will in the future be managed as part of the new Sustainable Production Systems Research Program. This program will primarily support large, multi-disciplinary and integrated research projects.

Based on an extensive review process two large swine and pork related research projects have been approved. In addition, swine reproduction research will be managed as part of a larger reproductive technology research project. Over time many of the individual research projects that are listed above will be integrated into these larger research themes.

The three approved projects are:

1. **Sustainable pork production: from gene expression to nutrient utilization efficiency and pork meat quality.** leader **K. de Lange** (Department of Animal and Poultry Science); team members: **S. Barbut** (meat science), **C. Dewey** (swine health management and epidemiology), **M. Fan** (swine nutrition and ecology), **C. Forsberg** (microbiology), **J. France** (mathematical modeling), **I. Mandell** (meat science), **P. McEwen** (pork production), **P. Purslow** (meat science), **A. Robinson** (genetics), **J. Squires** (biochemistry and gene expression), **A. Weersink** (Agriculture economy), **T. Widowski** (ethology)
2. **Sustainable pork production: Healthy pigs and safe pork.** Leader: **B. Friendship (** Department of Population Medicine); team members: **C. Dewey** (swine health management and epidemiology), **P. Boerlin** (bacteriologist), **C. Gyles** (bacteriologist), **S. McEwen** (public health), **K. Warriner** (meat scientist) **T. Widowski** (ethologist), **S. Millman** (ethologist) **A. Brooks** (pathologist) **B Wilkie** (immunologist) **J. MacInnes** (microbiologist) **K. deLange** (nutritionist) **T. Hayes** (pathologist) **J. Squires** (biochemistry and gene expression).
3. **Reproductive technologies – from test tubes to animals.** Leader **W.A. King** (Department of Biomedical Sciences); team members: **P. Bartlewski** (Reproductive imaging and endocrinology, **G. Bédécarrats** (Neuroendocrine control of reproduction), **D. Betts** (Gene expression, epigenetics and cloning), **M. Buhr** (Cryobiology, sperm technology), **A. Croy** (Reproductive immunology and uterine function), **A. Hahnel** (Spermatogenesis, spermatogonial transplantation), **W. Johnson** (Reproductive health and management), **J. LaMarre** (Gene expression and message stability, **J. Leatherland** (Fish brood stock health markers), **J. Li** (Gamete and Stem cell biology), **J. Petrik** (Ovarian biology).