



OAHN FINAL REPORT

Project #: 03

Project Title: The creation of a network of sentinel pig farms to enable coordinated preparedness, early detection, and response to animal disease.

Project Lead: Dr. Robert Friendship

Collaborators: Dr. Tim Blackwell, Dr. Terri O'Sullivan, Dr. Zvonimir Poljak, Dr Vahab Farzan.

Start date: **End date:**

Executive Summary

Fifty farms participated in the study. On 15 farms participated by submitting nursery information such as mortality and treatment records and 35 farms allowed our team to visit the farm twice and complete a survey and gather blood, and fecal samples and weigh a representative subset of pigs at entry and exit. Additionally 20 producers requested diagnostic testing. The majority of testing was for monitoring of Porcine Reproductive and Respiratory Syndrome virus although other testing included *Streptococcus* culturing and serotyping, testing for porcine circovirus, influenza virus, and *Mycoplasma suis* was investigated in one herd.

Objectives

The overall objective of this project is to create a sustainable program of demonstrated value to stakeholders. The first goal will be to enroll a minimum of 50 nursery barns in Ontario to act as sentinel farms representing the Ontario industry. If additional industry support is provided, a larger number of herds will be enrolled. Husbandry practices, including antibiotic use will be recorded, and production data collected. Blood, fecal and saliva samples will be collected from these farms, some stored and some analyzed for specific diseases. Funding has been secured for testing of some diseases such as influenza and *Streptococcus suis* and further funds are being sought to enable additional testing of the samples and analysis of the information. A portion of the OAHN funds will be used for pathogen identification.

A second objective is to determine the prevalence of specific clinical signs such as coughing, lameness, diarrhea, ear necrosis, hernias etc. and important swine pathogens and to explore

whether the presence of certain pathogens is related to specific clinical signs, increased medication use, or a reduction in production performance.

Results

Preliminary analysis shows differences in performance at the pig- and batch-level. Retrospective records indicate average daily gain, measured at the batch level, ranging from 390 to 570 grams per day. Weighing pigs at the individual level will allow accurate assessment of variability within individual batches, information that is currently not widely available. Mortality rate ranges from 0.1% to 7.5%. Volatility of the health situation is demonstrated by long periods of optimal mortality (<2%) and occasional spikes (>5%). Once completed, results are expected to demonstrate to producers the importance of record-keeping and aid veterinarians in using similar data to assess the economic impact of interventions.

The most common disease problems resulting in mortality that were reported were Streptococcal meningitis and post weaning diarrhea. Porcine Reproductive and Respiratory Syndrome and Influenza were also commonly mentioned. Medication use varied from no antibiotics used to multiple antibiotics used at a treatment level to the entire nursery.

Some samples from herds on this project were used in a research project that examined the prevalence and antimicrobial susceptibility patterns of *Streptococcus suis*. Twenty-two serotypes were identified, with type 9 and 31 being the most commonly found serotypes in sick and healthy pigs, respectively. Untypable isolates were found in 61% of healthy and 40% of sick pigs. Less than 1.0% of isolates were resistant against ampicillin, ceftiofur, and florfenicol, while resistance was seen against tetracycline (84.2%), tiamulin (65.2%), and spectinomycin (40.4%), and trimethoprim/sulfa (13.2%). These findings can be used to develop a more effective vaccination and treatment strategies to prevent *S. suis* infection outbreaks in pigs.

Diagnostic testing that was pursued with support from this research project included the following two cases. Firstly, a herd with wasting pigs used funding to investigate porcine circovirus. There was widespread viremia, and the virus was found to be PCV type 2d. Although vaccine was being used, the veterinarian was unsure of how to interpret the results. It is possible that immunity was insufficient because of the new serotype but based on more recent

information it is likely there was a problem with the vaccination procedure or the particular bottle of vaccine that had been used.

A farm not using antibiotics that had some anemic pigs asked to check for *Mycoplasma suis*. The AHL used a gel PCR found positives for *Mycoplasma suis* and used sequencing to verify.

Although this proved that *M. suis* was present on the farm it is unknown whether anemia was related to the presence of *M. suis* or the finding was coincidental. *Mycoplasma suis* was present in pigs without anemia as well.

Discussion / Suggestions for next steps

As a result of this project there are sera and fecal samples that have been stored and will be tested to determine how endemic diseases cycle within the nursery. For example, one project is examining the prevalence of Salmonella. Preliminary results have revealed that 56% (132/235) of nursery pigs from 12 farms were *Salmonella* seropositive at entry and 32% (74/233) were positive at the end of the nursery stage. Of the twelve farms so far tested, it was found there was a decrease in number of seropositive pigs during the nursery phase on most farms (11/12) indicating the disappearance of passive immunity but on one farm seropositivity increased indicating active infection in the majority of pigs in this nursery. This type of analysis will provide information on the epidemiology of pig diseases that can be used by practitioners to try to eliminate endemic disease problems.

Communications