

Title: Development of standard methods to compare surveillance between regional porcine reproductive and respiratory virus control projects – **NPB #12-179**

Investigator: Derald Holtkamp¹

Co-Investigators: Robert Morrison², Leigh Rosengren³

Institution: Iowa State University¹, University of Minnesota², Rosengren Epidemiology Consulting Ltd.³

Date Submitted: December 5, 2013

SCIENTIFIC ABSTRACT

The North American Swine industry recognizes the potential value of a porcine reproductive and respiratory syndrome virus (PRRSV) control and elimination strategy. As for any disease control, methods to track changes in prevalence and detect herd status changes will be required. Surveillance is expensive. Methods are needed to ensure it is cost effective. These methods can be piloted and applied in regional PRRSV control and elimination projects that are actively engaged in PRRSV monitoring.

This project developed a data collection tool, methods of analysis, and standardized reports to help regional PRRSV control and elimination projects monitor the PRRSV status of the region and benchmark their monitoring efforts against each other. The methods are unique because no monitoring protocols are dictated. Rather, each herd sets its own monitoring strategy. This helps ensure the strategy is appropriate and cost effective for each herd. The methods quantify the information provided by each herd's monitoring activities to describe the regional status without dictating herd monitoring protocols.

This project is based on the following three principles: i) A herd or region cannot be absolutely proven to be free of disease; ii) The degree of confidence that a herd or region is disease free can be described; and iii) A disease free status can be inferred on herds or regions exceeding an agreed-upon confidence. These methods describe a region's PRRS virus circulation (VC) status by compiling the confidence about the VC-status of the herds in the region. The confidence in each herd's status is adjusted each week by discounting the prior knowledge and by adding any new knowledge generated through diagnostic testing or clinical reporting. Confidence accumulates with supporting evidence such as negative diagnostic test results or a continued absence of clinical signs. Confidence erodes over time because the chance that a change has occurred which makes the information

These research results were submitted in fulfillment of checkoff-funded research projects. This report is published directly as submitted by the project's principal investigator. This report has not been peer-reviewed.

For more information contact:

National Pork Board • PO Box 9114 • Des Moines, IA 50306 USA • 800-456-7675 • Fax: 515-223-2646 • pork.org

incorrect increases as time passes. This can be thought of as a leaky bucket; Information must be continually added to maintain the desired level of confidence.

This project designed reports to facilitate comparisons between herds within the region and between projects. As the Swine Industry expands its PRRSV control and elimination efforts PRRSV status must be measured clearly, consistently, and transparently so that discussions about regional spread are valid and interventions can be evaluated for efficacy. These reports can facilitate these conversations by ensuring regions are reporting current and comparable results. Reports are generated including the monthly trend in the prevalence of PRRS VC-negative herds in the region. For regions with no known positive herds, the probability the region is PRRS VC-negative is also reported. Regional PRRSV freedom can be claimed when the probability exceeds an industry accepted standard.

This project leveraged the prior work and expertise of a working group established by the PRRS Coordinated Agricultural Project (PRRS-CAP) project (USDA NIFA Award 2008-55620-19132). The project also built on existing programs in Canada that have been supported by the Canadian Swine Health Board (Development of a PRRS-Free Certification Project & Sustainability and Enhancements of the PRRSV Free Certification Project).

This project provides value to regional control and elimination projects. Freedom from disease modelling is a rapidly developing field that is becoming accepted in international trade. The types of outcomes provided by these methods will be required by regions that achieve and claim PRRSV freedom. Until that happens, the reports will provide useful information to regions striving to control PRRSV.