

SWINE HEALTH

Title: Evaluation of air filters as a novel surveillance method to assess spread of airborne PRRS viruses – **NPB #19-164**

Investigator: Montse Torremorell

Institution: University of Minnesota

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Scientific Abstract:

Porcine reproductive and respiratory syndrome virus (PRRSV) and influenza A virus (IAV) are two major respiratory pathogens of pigs that can be transmitted through the air. In a prospective study, we evaluated the detection of both PRRSV and IAV from air filters installed in breeding herds of farms located in medium to high pig density areas to evaluate the use of air filters as a surveillance method to monitor the regional spread of PRRSV and IAV. Filters from either PRRSV negative or stable herds were removed at approximately 6, 8, 11 and 14 months post installation and 5 samples from each filter were tested by RT-PCR for PRRSV and IAV. A filter was considered positive if at least one sample tested positive. Samples positive for PRRSV or IAV were further analyzed with whole genome sequencing. Out of the 136 filters installed, ten (1.5%) samples corresponding to seven (5%) filters from three farms tested positive for PRRSV. During the study, PRRS outbreaks were reported in four farms, however, only one PRRSV positive filter originated from farms that had PRRS outbreaks. In contrast, 65 (47.8%) filters from all seven farms tested positive for IAV, with a total of 131 samples positive (19.3%). Six IAV positive samples were sequenced and one sample was successfully subtyped as an H3N2 human-like influenza virus. In addition, multiple lineages were identified for the influenza internal genes from different samples. In conclusion, testing of used air filters in swine farms did not result in an enhanced surveillance method for airborne PRRSV. However, used filters for influenza surveillance should be further evaluated. Overall, detection of PRRSV and IAV in the air filters showed potential evidence of regional airborne transmission for these viruses, but additional investigations are needed to better understand the factors that contribute to airborne transmission of these viruses.

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 This report has not been peer-reviewed.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
