

SWINE HEALTH

Title: Evaluation of the risk of a feed mill being contaminated with PEDv or PDCov -
NPB #14-165

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Scientific Abstract:

Twenty-four feed mills from various regions (Eastern, Midwest, Western, and Northern Midwest) in the US were evaluated in this study to assess the risk of different areas within a mill to test positive for either porcine epidemic diarrhea virus (PEDv) or swine delta coronavirus (PDCov). Samples were collected at each feed mill for up to 5 days. Sample areas included: both foot pedals of feed delivery truck, bulk ingredient unloading pit, inside mixer/pellet cooler, mill office floor, inside feed compartment on feed truck, and incoming bagged ingredient truck (inside of truck near site of off-loading). Samples were collected using a technique similar to the Swiffer® technique described by Dee et al. In brief, a wet gauze pad was used as the transfer material and was placed into 25 mL of phosphate buffered saline (PBS). The gauze was then squeezed multiple times in the solution and then the supernatant was poured into a sterile, transfer tube. The samples were submitted to diagnostic facilities for PCR testing for PEDv and PDCov. The results of the feed mills for each collection site within the mill and for the mill itself were compiled. Feed mills were assigned a letter for anonymity during analysis and final report. Data were analyzed as probabilities and risk assessments for each area within the mill being tested. In addition, a break-down of the risk of contamination of the mills that already serviced positive herds was evaluated. A summary table was generated from the results above to report the risk of a feed mill being contaminated with either PEDv or PDCov. Raw data percentages demonstrated that no samples tested positive for PEDv. However, 5% of the truck foot pedals and 1% of the bulk ingredient pit tested suspect for PEDv. Porcine delta coronavirus was found on 3.4% of the foot pedals of the trucks and 2.2% of the office floors tested suspect. Of the feed mills tested, 75% of the mills were providing feed to herds infected with PEDv and 21% were feeding herds infected with PDCov. An additional 33% of the feed mills reported “unknown” of the PDCov status of the herds that they were feeding. As the number of days increase, the probability of a positive/suspect result also increases for locations such as the foot pedals, office floor, bulk ingredient pit and the inside of the feed truck compartment. Based on the results by day and the percentage of mills that were feeding positive herds, after one day of negative test results on foot pedals, there is a 74% chance that the foot pedals could test positive for PEDv with additional days of testing. When evaluating the probability of a PDCov positive/suspect result on the foot pedals, there is a 28% chance that the mill will have a positive result in the next four days after the first day of negative results regardless of the health status of the herds being fed from that mill. One feed mill that was servicing PDCov negative herds tested PCR suspect on the office floor, which indicates that the health status of the herds being serviced by the feed mill may not be the only potential cause for a positive/suspect finding. In conclusion, this study demonstrates that both PEDv and PDCov virus particles can be detected at different locations associated with a feed mill. This study does not determine if the virus particles are infectious and therefore, only demonstrates the probably of detecting virus particles at the various locations based on the number of days testing occurs and also based on the health status of the herds being fed from the mill.

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