

Infectivity of Swine Manure from Pits at Varying Lengths of Time Post Infection with Porcine Epidemic Diarrhea Virus (PEDV)

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Background: Little is known about how long PEDV will survive in deep manure pits after infected pigs have been on a site. Early data from Dr. Sagar Goyal suggests PEDV can survive in slurry at least 28 days when stored at 4 and -20 degrees Celcius, and 14 days at ~25 degrees Celcius (NPB #13-215). As the manure pumping season of 2014 approaches, there is mounting concern about the risk of transporting viable virus in manure hauling and application equipment between sites.

Objective: The objective of this study was to test 15 pits from sites that were 6 months post PEDV infection and 15 pits from sites that were 4 months post PEDV infection for the presence of viable virus through swine bio assay.

Materials and Methods: Pits were sampled from manure pump outs using a 10' section of ½" PVC pipe that was angled as far into the pit under the animal space as possible. A minimum of three pump outs were sampled at each site. 21 day old barrows were housed individually for the bio-assay, and randomly assigned to a manure inoculum from one site. 20 mL of manure was administered via gastric tube and were observed for 3.5 days before necropsy at the U of MN VDL. Negative control pigs (n = 4) received manure from a PEDV negative barn. Positive control pigs (n = 2) received feedback material from a PEDV positive sow farm.

Results: Of the 15 barns sampled at 6 months post PEDV infection, 14 tested positive by PCR. Of those, none were positive by bio assay. Of the 15 barns at 4 months post PEDV infections, 13 tested positive by PCR. Of those, two were positive by bio assay which included an intestinal PCR cycle time value lower than the inoculum used, presence of villi lesions, and positive immunohistochemistry. Negative controls were PEDV negative, and positive controls were PEDV positive at the end of the trial.

Conclusion: The results of this study indicate that PEDV is able to survive in deep manure pits for at least 4 months. Limitations of the study include; small amount of manure was tested (20 mL) and samples were drawn only from perimeter of barn through pump outs. Therefore, it is possible that some pits may have had live virus that these methods failed to detect.

The implications of these data support the continued need to be conscientious of pumping events during the fall of 2014. Work from disease free to disease challenged barns; paying particular attention to do those sites most recently infected with PEDV last. Continue to require pumping crews to adhere to other biosecurity rules including cleaning, disinfecting and down time between sites. Communication with neighboring sites is encouraged to prevent the application of potentially infective manure near disease free sites. It is hopeful that with proper planning/communication as well as attention to sequencing and biosecurity, the frequency of transmission events related to pumping will be low during 2014.

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