

**Title:** Determination of the sites of tissue localization, routes of viral shedding, duration of virus carriage, kinetics of antibody response, and potential of aerosol transmission of Porcine Deltacoronavirus (PDCoV) following inoculation of nursing pigs and their dams –  
**NPB # 14-182**

**Investigator:** Dick Hesse<sup>1</sup> and Sarah Vitosh-Sillman<sup>2</sup>

**Institution:**

1. Kansas State Veterinary Diagnostic Laboratory, Department of Diagnostic Medicine and Pathobiology, Kansas State University, Manhattan, KS, [dhesse@vet.k-state.edu](mailto:dhesse@vet.k-state.edu)
2. School of Veterinary Medicine and Biomedical Sciences, University of Nebraska-Lincoln, Lincoln, NE

### Scientific Abstract:

Porcine deltacoronavirus (PDCoV) is a newly identified virus which has been detected in swine herds of North America associated with enteric disease. The aim of this study was to demonstrate the pathogenicity, time course of infection, virus kinetics, and aerosol transmission of PDCoV using 87 conventional piglets and their 9 dams, including aerosol and contact controls to emulate field conditions. Piglets 2-4 days of age and their sows were administered an oronasal PDCoV inoculum with a quantitative real time reverse-transcription polymerase chain reaction (qRT-PCR) Ct of 22 generated from a field sample having 100% nucleotide identity to USA/Illinois121/2014 and testing negative for other enteric disease agents using standard diagnostic assays including metagenomic sequencing. Serial samples of blood, serum, oral fluids, nasal and fecal swabs, and tissues from sequential necropsy, conducted daily from days 1-8 and regular intervals thereafter, were collected throughout the 42-day study for qRT-PCR, histopathology, and immunohistochemistry (IHC). Diarrhea developed in all inoculated and contact control pigs, including sows, by 2 days post-inoculation (DPI) and aerosol control pigs and sows by 3-4 DPI, with resolution occurring by 12 DPI. Mild to severe atrophic enteritis with PDCoV antigen staining was observed in the small intestine of affected piglets from 2 to 8 DPI. Mesenteric lymph node and small intestine were the primary sites of antigen detection by IHC, and virus RNA was detected in these tissue samples to the end of the study. Virus RNA was detectable in piglet fecal and nasal swabs to 21 DPI, and sows to 14-35 DPI.

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For more information contact:

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

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