

Title: Characterization of the pathogenesis of porcine epidemic diarrhea virus (PEDv) in neonates and weaned pigs and generation of reference diagnostic specimens – **NPB #13-244**

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Scientific Abstract

Weaned pig study:

Porcine epidemic diarrhea virus (PEDV) is associated with clinical diarrhea in naïve swine of all ages. This report describes timing of antibody generation and disease progression following infection with a US PEDV isolate by assessing fecal viral shedding, morphometric analysis of intestinal lesions, and magnitude of immunohistochemical staining. Sixty-three, three-week-old pigs were randomly allocated into control ($n=27$) and challenged ($n=36$) groups. Challenged pigs were administered 1 ml of 1×10^3 PFU/ml of US/Iowa/18984/2013 PEDV isolate by oro-gastric gavage. Three control and four challenged pigs were necropsied on days post inoculation (dpi) 1, 2, 3, 4, 7, and weekly thereafter, until study termination on dpi 35. Clinical disease, fecal shedding, body weight and temperature were monitored during the study period. Diarrhea was observed in challenged pigs beginning for some on dpi 2, affecting a majority of pigs by dpi 6 and subsiding by dpi 10. Average daily gain was significantly lower ($P<0.001$) for one week post infection in challenged pigs. PEDV was detected in feces by PCR on dpi 1 and continued in a subset of pigs until dpi 24. PEDV-specific antigen was detected in villous enterocytes of challenged pigs by immunohistochemistry (IHC) on dpi 1, 2, 3, 4, 7, and 14. Microscopic lesions included severe diffuse atrophic enteritis with significantly reduced ($P<0.001$) villous length observed on dpi 3, 4, and 7. Oral fluid detection of PEDV RNA was similar to fecal swab detection, and reinfection does occur, but clinical signs can be unapparent and shedding is of short duration. Under the conditions of this study, fecal shedding of PEDV and IHC staining can precede and continue beyond the observation of clinical signs, thus increasing the risk of viral transmission.

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 This report has not been peer-reviewed.

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