

SWINE HEALTH

Title: Molecular Epidemiology of Porcine Circovirus in the US Swine Herd, **NPB #07-221**

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Abstract

To better understand the epidemiology of porcine circovirus in the U.S. swine herd, ELISA and PCR tests were developed and characterized to specifically differentiate and quantitatively assess the status of PCV1 and PCV2 infection in serum samples collected from finishing pigs in 2006 as part of the NAHMS swine health survey. A quantitative Tetra-Nucleotide Discrimination (TND) Assay was developed to measure simultaneously the amount of PCV1 and PCV2 in a test sample. Approximately 80% of serum samples were positive for PCV2 virus, whereas only 2.5% were positive for PCV1 virus. The mean titer was about 10^4 copies/ml serum. Forty-one percent of samples were only PCV2b, 31% were PCV2a and 10% were mixed infections of PCV2a and PCV2b. To establish baseline serological data for exposure to PCV, more than 6,200 serum samples from 187 farms throughout the U.S. were evaluated for serological response to PCV1 and PCV2 using amino-terminal deleted capsid proteins expressed in bacteria. About 80% of samples were positive for PCV2. More than 50% of animals sampled on nearly all farms were seropositive; on only one farm were all samples test-negative. PCV1 antibodies were detected in about 20% of serum samples. The findings to date indicate that PCV1 is only rarely present in finishing pigs. PCV2 is widespread in individual pigs, indicative of a viremic, active infection. Interestingly, in 81% of cases the serological and virological status of a sample were concordant for PCV2, either both positive and negative, and were discordant 19% of the time. While not a specific finding of this study, the data also suggest that the practice of serum inoculation might result in extensive dissemination of PCV2 within a herd.

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 This report has not been peer-reviewed.

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