RESEARCH ABSTRACT

SWINE HEALTH

Title: Evaluation of diagnostic performance characteristics of commercially-available CSFV tests – **NPB #14-087**

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Scientific Abstract:

Classical swine fever virus (CSFV) is endemic and circulates in many regions of the world; therefore, the potential re-emergence of CSFV is a continual risk. It is in the pork producers' best interests to develop an effective CSFV detection-and-response strategy, recognizing that an effective response must be based on a technology and an organization capable of quickly identifying and eliminating foci of infection. The goal of this research was to evaluate the diagnostic performance characteristics of commercially-available CSFV tests.

In this study, 602 serum and 1,411 oral fluid samples were collected from inoculated (ALD strain) or vaccinated pigs (LOM strain) from -14 to 28 days post inoculation (DPI) or vaccination (DPV). Virus detection was attempted by virus isolation (VI), 3 commercial real time, reverse-transcription polymerase chain reaction (rRT-PCR) assays, and 2 commercial antigen-capture ELISAs. Antibody detection was evaluated using serum neutralization (SN) and 3 commercial antibody ELISAs.

Following inoculation with the CSFV ALD strain, clinical signs observed in infected pigs included fever (>104°F), lethargy, anorexia, diarrhea, constipation, and skin hemorrhage. CSFV was isolated from serum as early as DPI 3 (20%) and as late as DPI 21(13%); by rRT-PCR as early as DPI 2 (10%) and as late as DPI 28 (27%); and by antigen-capture ELISAs as early as DPI 6 (60%) and as late as DPI 17 (21%). Neutralizing antibody was detected as early as DPI 7 (21%), with detection by commercial antibody ELISAs early as DPI 10 (15-22%). By DPI 17, there was no difference in the detection between SN and antibody ELISAs (95% vs. 84-90%).

CSFV-vaccinated pigs were positive by rRT-PCR as early as DPI 5 (20-50%) and as late as DPI 10 (28-31%). Only a few samples were positive by antigen ELISAs. CSFV antibody was detected in vaccinates as early as DPV 10 by SN (86%) and antibody ELISAs (3-14%). By DPV 21, antibody detection in vaccinated pigs was not statistically significantly different between the SN (100%) and antibody ELISAs (86.2-89.7%).

The results from the present study indicated that each CSFV assay had its limitation(s) in detection, in large part depending on the test target (virus, antigen, nucleic acid, or antibody). Notably, commercial CSFV rRT-PCRs were more sensitive for early detection, whereas antibody assays were more sensitive in later stages. Therefore, it is important to perform the assay(s) most appropriate to the stage of infection (acute vs. chronic) and intended purpose (screening vs. confirmatory). Overall, commercial rRT-PCR and antibody ELISAs are suitable for large scale screening whereas virus isolation and serum neutralization should be used exclusively as confirmatory assays.