

SWINE HEALTH

Title: Development of diagnostic assays for detecting PRRSV infection using oral fluid samples as an alternative to serum-based assays – **NPB #09-234**

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Scientific abstract: For effective disease surveillance, rapid and sensitive assays are needed to detect antibodies against PRRS virus (PRRSV) infection. In this study, we developed a multiplexed fluorescence microsphere immunoassay (FMIA) for detection of PRRSV specific antibodies in oral fluid and serum samples. Recombinant nucleocapsid protein (N) and nonstructural protein 7 (nsp7) from both PRRSV genotypes (Type I and Type II) were used as antigen and covalently coupled to Luminex fluorescent microspheres. Based on an evaluation of 488 oral fluid samples with known serostatus, the oral fluid-based FMIA were achieved greater than 92% sensitivity and 91% specificity. In serum samples (n = 1639), the FMIA reached greater than 98% sensitivity and 95% specificity. The assay was further employed to investigate the kinetics of antibody response in infected pigs. In oral fluid, N protein was more sensitive for the detection of early infection (7 and 14 dpi), but nsp7 detected higher and longer antibody response after 28 days post infection. In serum, the antibodies specific to nsp7 and N proteins were detected as early as 7 days post infection, and the responses lasted more than 202 days. This study provides a framework from which a more robust assay could be developed to profile the immune response to multiple PRRSV antigens in a single test. The development of oral fluid-based diagnostic tests will revolutionize the way we survey for swine herds and improve our ability to cheaply, efficiently track PRRSV infections in both population and individual animals.

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 This report has not been peer-reviewed.

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