RESEARCH ABSTRACT

SWINE HEALTH

Title: Development and Optimization of a Blocking ELISA for Type 1 and Type 2 Strains of Porcine Reproductive and Respiratory Syndrome Virus – **NPB #05-168**

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Abstract:

The PRRS virus (PRRSV) continues to be a significant economic concern for swine producers in the U.S. and throughout the world. Recently, the presence of an emerging European-like strain that is genetically and antigenically distinct from the original European Type 1 and U.S. Type 2 strains has impacted the sensitivity of current diagnostic techniques and consequently has complicated the detection of PRRSV in swine herds. The IDEXX HerdChek® PRRS assay, a commercially available enzyme-linked immunosorbant assay (ELISA) has become the industry standard for the detection of antibodies against PRRSV. The need to accurately determine the PRRSV serostatus of herds and individual animals has prompted the development of confirmatory tests that enable differentiation of true positive samples from presumed false positives. A highly specific and repeatable blocking ELISA (bELISA) was developed with the use of both U.S. Type 1 & 2 nucleocapsid (N) proteins as the antigen and two competitive monoclonal antibodies specific for highly conserved regions within the N protein. Validation of the bELISA was performed by using 537 serum samples from 42 individual animals that were experimentally infected with either U.S. Type 1 or U.S. Type 2 PRRSV. Receiver operating characteristic analysis determined a diagnostic sensitivity and specificity of 99.3% & 99.1%, respectively. Further analysis of the data enabled us to establish a definitive cutoff point of 39.7 and to identify times of seroconversion for both PRRSV genotypes. Furthermore, the bELISA was able to resolve 72% of unexpected positive IDEXX ELISA results obtained from a collection of 196 diagnostic field samples. Our results show that the bELISA may be useful as a confirmatory test to evaluate suspect results obtained with the IDEXX ELISA, due to its increased sensitivity and detection capabilities.