

SWINE HEALTH

Title: Comparison of porcine high fever disease isolates of PRRSV to US isolates for their ability to cause secondary bacterial infection in swine - **NPB #11-119**

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Scientific Abstract

The appearance of highly-pathogenic porcine reproductive and respiratory syndrome virus (PRRSV) isolates in Asia necessitates investigation into the clinical repercussions of these viruses if the strains were to appear in the US. Epidemiologic data from Asian outbreaks suggest that disease severity was associated with both the PRRSV isolates from these cases and secondary bacterial infections. Previous reports have indicated that US isolates of PRRSV predispose to secondary bacterial infections as well, but outbreaks like the ones described in Asia have not been reported in the US. The objectives of this research were to compare the pathogenesis of Asian and US PRRSV isolates of varying virulence with regard to their ability to cause disease and predispose to secondary bacterial infections in swine. The experiment consisted of 10 groups of 9-10 pigs each. At 6 weeks of age, half the groups were inoculated with a bacterial cocktail of *Streptococcus suis*, *Haemophilus parasuis*, and *Actinobacillus suis* and 1 week later 4 bacterial colonized groups and 4 non-bacterial colonized groups were inoculated with 1 of 2 Asian HP-PRRSV strains (JXwn06 or SRV07) or 1 of 2 US PRRSV strains (SDSU73 or VR2332). The pigs infected with JXwn06 were clinically the most severely affected (based on clinical signs, febrile response, and weight gain) while the pigs infected with SRV07 and SDSU73 were moderately affected, and pigs infected with VR2332 showed minimal clinical signs. One pig coinfecting with JXwn06 and bacteria became moribund and was euthanized. An increase in the levels of proinflammatory cytokines in the sera occurred, in general, around day 6-8 post viral infection with the magnitude of increase generally correlating with the severity of clinical disease. The highest viral titers were detected in pigs challenged with JXwn06. *S. suis*, *A. suis* and/or *H. parasuis* was cultured from the lungs of 1/9 pigs from group challenged with the bacteria alone, 2/9 pigs challenged with VR2332/bacteria, 3/9 pigs challenged with SDSU73/bacteria, and from 5/9 pigs challenged with SVR07/bacteria and JXwn06/bacteria. These bacteria were not isolated from the non-challenged control pigs or pigs challenged with virus alone. Lesions consistent with bacterial pneumonia, including abscesses, were seen in the groups coinfecting with PRRSV and bacteria. The levels of proinflammatory cytokines in the serum were often lower for pigs coinfecting with virus and bacteria compared to pigs infected with PRRSV alone indicating an alteration in the immune response in coinfecting pigs. There was a range of virulence among the PRRSV isolates and differences in their ability to predispose to secondary bacterial infection.

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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