

## SWINE HEALTH

**Title:** Predictors of response and genetic resistance/susceptibility in pigs to infection with Porcine Reproductive and Respiratory Syndrome virus - **NPB# 08-257**

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### Scientific Abstract

The primary objective of this study was to determine differences in growth rate and expression of specific immune function genes and levels of cytokines between pigs that are more resistant and more susceptible to PRRSV infection. The data generated in this replication were combined with data from a previous replication. At  $34 \pm 5$  days of age ( $8.2 \pm 1.8$  kg body weight), 220 weaned pigs free of PRRSV were transported from their farm of origin to the wean-to-finish barn at the Haskell Agricultural Laboratory. The pigs were randomly allotted to one of 16 pens (2.4 m x 4.3 m) that held 12 to 14 pigs per pen. After a 19-day adjustment period, all pigs were weighed and blood samples were collected. Approximately 3 to 5 mL of blood was withdrawn. The pigs were inoculated with PRRSV FL12 ( $10^{4.8}$  TCID<sub>50</sub>/2 mL) by injection in the neck muscle 2 mL of virus preparation (one-half of dose on each side of neck). Blood was drawn at 4, 7, and 14 days post-inoculation to monitor response to virus. Body weight was recorded at 4, 7, 14, and 35 days post-inoculation and every two weeks after day 35. Blood samples were analyzed for viremia and interleukin 8 (IL8). An index of serum viremia and body weight changes were used to describe response to virus. Levels of IL8 were related to viremia and body weight responses. Mean viremia for Replication 1 and 2 was similar four (5.76 and 5.59 viremia, log 10) and seven days (6.15 and 5.67 viremia, log 10) post-infection, but then dropped sharply at 14 days in Replication 2 (3.82 viremia, log 10). Correlations among weights at 0, 4, 7, 14 and 35 days after inoculation with PRRSV, viremia at 4, 7 and 14 days after inoculation, and pre-inoculation levels of IL8 were relatively low. Weight gain from 0 to 4, 4 to 7, 7 to 14, and 14 to 35 days after inoculation, viremia at 4, 7, and 14 days after inoculation, and pre-inoculation levels of IL8 were negatively correlated. The distribution of pigs with various levels of viremia at 4, 7, and 14 days post-inoculation indicate that some pigs have low replication rates, while others have very high replication rates. This variation suggests underlying variation in the pig's immune response to virus. The hypothesis is that some of the variation is due to the pig's genetic makeup and that selection for genes that inhibit viral replication may reduce the incidence and severity of disease.

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