

**Title:** Evaluating nutritional strategies to mitigate the negative impact PRRS has on grow-finisher pig performance – **NPB #15-099**

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**Scientific Abstract:** Porcine Reproductive and Respiratory Syndrome (PRRS) virus is a significant respiratory pathogen in grow-finish pigs. Our objective was to determine the growth performance and tissue accretion of pigs given nutritional supplement via water or feed additive during a PRRSV challenge. A 108 PRRSV naïve maternal line (PIC Cambro x Landrace and Landrace x PIC Cambro) barrows (BW  $69 \pm 3.1$  lbs) were weighed and evenly stratified by BW and genetics across 18 pens (6 pens/trt and 6 pigs/pen). Pigs were housed at a commercial barn during the summer months that contains 1 room of 18 pens with curtain-sided ventilation. All pigs were allowed a 5 d adaptation to their environment prior to treatment. Pens were allotted to 1 of 3 treatments: 1) PRRSV Control diet, 2) As #1 + water additive, and 3) As #1 + feed additive. Water and feed additive were produced by TechMix LLC and contained a proprietary combination of proteins, amino acids, carbohydrates and electrolytes which included betaine, soy protein isolates, monosodium glutamate, and high fructose corn syrup. The water and feed additive contained 8.53 and 35.4% CP, respectively. Water additive provided from 1 dpi to 4 dpi at 1:128 inclusion and increased to 3% inclusion from 4 dpi to 8 dpi. Treatment 3 treatment didn't receive water additive after 8 dpi. A 55% water additive (45% water) was included at 3% from 14 dpi to 18 dpi for treatment 2 only. Feed additive was included at 1.25% of ration and was hand mixed into ration from 8 dpi to 35 dpi for treatment 3 only. From dpi 35 – 42, all pigs were on the same water and diet. Water intake was measured for each treatment using water meters on the water line that went to each treatment. Feed intake, BW and G:F were calculated weekly for 42 days dpi. Two days prior to inoculation and again at dpi 42, a subset of 36 pigs (2 pigs/pen) of the same genetic line and similar to the average pig weight within pen

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were scanned via dual x-ray absorptiometry (DXA) to determine initial and then final whole body composition and tissue accretion rates then calculated. As expected, all pigs became PRRSV positive and seroconverted in a time dependent (dpi) manner ( $P < 0.05$ ). However, no treatment or treatment by time interaction was observed. No treatment differences in serum glucose, glucagon, insulin, haptoglobin, NEFA, and BUN were observed. In response to the PRRSV challenge, there was no difference ( $P < 0.05$ ) in ADG, ADFI, or G:F during weekly performance or overall performance among treatments. From 0 – 14 dpi, all treatments were on average gaining 37% less and consuming 30% less than the predicted ADG and ADFI, respectively for 25-50 kg pigs (NRC, 2012). By dpi 28-35, all pigs irrespective of treatment were on average performing similar to predicted performance for pigs 25 – 50 kg (NRC, 2012).

Total body, bone mineral content, fat, lean, and protein accretion rates were not difference ( $P > 0.05$ ) among dietary treatments over the 42 dpi challenge period. However, all treatments had protein accretion rates that were 51% less than those predicted for 25-50 kg pigs (NRC, 2012). Further, sickness behavior (eating, drinking, and sitting) differences were not observed until 6 dpi. However, the nutrient supplement treatments had minimal effect on sickness behaviors of PRRS infected pigs. In conclusion, the addition of water and feed supplementation during a PRRSV challenge did not improve (maintain) growth performance or tissue accretion compared with PRRSV control. In addition, serum metabolites were not altered by the addition of either supplementation. It is possible that composition or inclusion of this proprietary water or feed additive may not have been best suited for PRRSV challenge and further work is needed to most likely optimize the amino acid profiles of such supplements.