

Title: Evaluation of dietary soybean meal replacement on grow-finisher pig performance when challenged with PRRS and Mycoplasma – NPB #15-148

Revised

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Scientific Abstract: Porcine reproductive and respiratory syndrome virus (PRRSV) and *Mycoplasma hyopneumoniae* (MHP) are two significant respiratory pathogens in finishing pigs, often found in tandem. Recent anecdotes have implied that increasing soybean meal content of diets can be beneficial in pathogen-challenged pigs, while other reports suggest similar benefits by increasing the use of synthetic AA, specifically Trp. The objective of this study was to determine if increased synthetic Trp replacing a portion of SBM would impact performance of late finishing pigs dual-challenged with PRRSV and MHP. To test this, two experiments were conducted. In the initial experiment (Exp1), ninety-six mixed sex pigs (48 gilts and 48 barrows, PIC 359 boar x PIC sows) were randomly assigned to one of two dietary treatments. The dietary treatments included a high SBM (HSBM) or low SBM (LSBM) diet. Both diets were formulated to contain 0.70% TID Lys and were isocaloric; only crude protein was different between HSBM and LSBM diets (15.9 vs. 13.5%, respectively). These diets were also formulated so that the low SBM diet provided higher amounts of synthetic Lys, Thr and Try, while keeping the Dig Thr/lys and Dig Tryp/lys ratios similar across both diets. Pigs were penned in groups of six with eight pens per treatment. After 96 days on feed and at 120.5 ± 1.42 kg BW, all pigs were health challenged for 28 days. All pigs were inoculated intratracheally with *Mycoplasma hyopneumonia* (MHP) and intramuscularly with a field strain of PRRSV. In the second experiment (Exp2), ninety barrows (89.3 ± 0.94 kg BW, PIC 359 boar x PIC sows), naïve to PRRSV, were assigned to one of two treatments for 49 d. Dietary treatments were the same as Exp1 and pigs were penned in groups of five with nine pens per treatment. On dpi 0, all pigs

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were dual inoculated with PRRSV and MHP as in Exp1. In both experiments individual body weight and pen feed intake were recorded weekly and pen feed efficiency was calculated until market (28 and 49 dpi, respectively for Exp1 and 2). PRRS and MHP serology were assessed weekly and pig carcass performance was assessed at slaughter. During the 96 day pre-challenge period (Exp1), no performance differences were detected between the two dietary treatments. As expected for both experiments, antibody titers for PRRSV and MHP increased post inoculation. However, change in PRRSV antibody titers from 0 to 28 dpi tended ($P = 0.09$) to be increased in LSBM versus HSBM pigs. MHP antibody titers and lung lesion scores did not differ between treatments. For the 28 or 49 day post-challenge period, there was no difference in ADG, ADFI or G:F due to diet ($P > 0.10$). Additionally, no diet difference in hot carcass weight, yield percentage or muscle depth were reported in either Exp 1 or 2 ($P > 0.10$). However, compared to the HSBM pigs, the LSBM pigs tended to have an increase in carcass fat depth ($P = 0.078$, Exp1), while loin muscle depth tended to be increased in Exp2 ($P = 0.087$). Altogether, these data indicate that diets with increased synthetic AA or decreased SBM do not alter pig performance or health during a late breaking respiratory health challenge.