HUBBARD
an Alltech company

SWINE SOLUTIONS

Firsthand research and experience with PRRS 1-4-4

By Ernie Hansen, Manager Swine Nutrition and Technical Services, Hubbard Feeds

Although the LLRC-1 wean-to-finish research barn is fully filtered, the reality is that it only takes one positive case of Porcine Reproductive and Respiratory Syndrome (PRRS) in an incoming litter to infect a whole barn. This fact was demonstrated in a recent nursery trial at Hubbard Feeds: 2,334 pigs entered the nursery at 15 lbs. and seroconverted with PRRS during the first three weeks post-weaning. While the pigs started exceptionally well on feed, given their wean age and weight, once the group seroconverted, performance was severely impacted, and most mortality occurred 18–43 days post-placement. By the end of the nursery stage, the mortality rate was just under 30%.

Given that previous research suggested components of soybean meal may have antiviral properties and benefit immune response during disease challenges such as PRRS, a trial was conducted to determine the impact of soybean meal level in diets during the grow-finish stage (See Table 1). Pigs were allotted two treatments with high or low levels of soybean meal, achieved by changing the inclusion of synthetic amino acids. Both treatments were isocaloric. There were 42 replicates per treatment and 21 pigs per pen, with an average starting weight of 90.7 lbs. The experimental diets were fed for 49 days. Pigs fed the high soybean meal diet had improved F/G (2.16 vs. 2.21, P <.01) and numerically higher ADG (2.25 vs. 2.20, P = 0.12) than those fed the lower soybean meal diet. Caloric efficiency was improved on the high soybean meal diet (P < .01), suggesting that the energy level of soybean meal may have been underestimated. While not statistically significant (P = 0.26), pigs on the high soybean meal treatment ended the trial 2.46 lbs. heavier.

Overall, pigs rebounded nicely after the nursery health challenge, with only two recorded mortality events (0.1%) and 11 removals (0.6%). The previous health challenge did not seem to cause a growth lag in the grow-finish stage. Although treatments were applied post-PRRS challenge, other studies show that higher levels of soybean meal may improve the performance of health-challenged pigs, suggesting potential benefits to the immune system. For instance, Johnston et al. (2010) observed that PRRS-positive grow-finish pigs had a 10% improvement in ADG and 8% improvement in F/G when fed high levels of soybean meal. Similar findings have been observed in nursery pigs (Rocha et al., 2013; Rochell et al., 2015). One of the potential modes of action is the presence of bioactive components in soybean meal, such as isoflavones and saponins, which possess anti-inflammatory, antioxidant and antiviral properties (Smith and Dilger, 2018).

It is, without a doubt, that many sow herds in the Midwest and now across the U.S. have experienced the devastation of the PRRS 1-4-4 strain. This virus and accompanying secondary challenges not only wreak havoc at the sow farm but also downstream wean-finish production, as can be seen in our nursery performance. However, we believe this data provides not only a potential dietary strategy but a look at the high level of the performance capability of grow-finish pigs once recovered from a nursery PRRS 1-4-4 break.

21-507F: Soybean Meal Level
Location: LLRC

Treatment	High AA Low SBM	Low AA High SBM	CV	P<
Pens	42	42	-	-
No. of Pigs	861	861	-	-
Beginning wt., lb.	90.69	90.71	5.0	.98
Period 1 (18d)				
ADG	1.99	2.02	6.0	.23
ADFI	3.97	3.94	7.0	.56
FG	1.99	1.94	3.2	.0006
End wt., lb.	126.56	127.31	4.4	.54
Gain	35.89	36.47	5.9	.22
Deads & removals	1d,1r	1d,1r	-	-
Caloric Efficiency	2302.76	2246.05	3.2	.0006
Period 2 (17d)				
ADG	2.30	2.37	7.4	.09
ADFI	5.09	5.13	9.0	.71
FG	2.21	2.16	3.7	.009
End wt., lb.	165.88	167.67	4.7	.29
Gain	39.18	40.31	7.4	.08
Deads & removals	4r	2r	-	-
Caloric Efficiency	2578.17	2523.46	3.7	.009
Period 3 (14d)				
ADG	2.35	2.40	8.0	.22
ADFI	5.75	5.73	9.9	.89
FG	2.44	2.38	3.9	.005
End wt., lb.	198.86	201.32	4.9	.26
Gain	32.94	33.64	8.0	.23
Deads & removals	3r	0	-	-
Caloric Efficiency	2861.67	2791.82	3.9	.005
Cumulative (49d)				
ADG	2.20	2.25	6.5	.12
ADFI	4.86	4.86	8.5	.97
FG	2.21	2.16	2.9	.0004
Gain	108.47	110.50	6.7	.21
Deads & removals	1d,8r	1d,3r	-	-
Caloric Efficiency	2570.48	2510.95	2.9	.0004