approximately 18 to 20 d of age and allotted to pens blocked by BW within sex. Pens were randomly assigned to 1 of 4 dietary treatments with 10 pigs/pen and 9 replications/treatment. Dietary treatments were arranged in a 2 × 2 factorial with main effects of added EFS (0 vs. 8% replacing soybean meal) and LP1 (0 vs. 0.1%). Experimental diets were fed in 2 phases (Phase 1: d 0-14 and Phase 2: d 14-24) with a common diet fed to all pigs from d 24-45 post-weaning. From d 0-24, pigs fed the diet containing EFS tended to have decreased (P = 0.088) ADFI compared to pigs fed diets without EFS; however, no evidence for differences were observed for ADG and G:F. Also, pigs fed diets containing LP1 tended to have improved (P = 0.053) G:F compared to pigs fed diets without LP1, with no evidence of differences observed for ADG or ADFI. Overall (d 0-45), a LP1×EFS interaction was detected for G:F (P = 0.021) where LP1 and EFS individually improved G:F, but the effects were not additive when combined. In conclusion, the addition of LP1 and EFS in nursery diets had variable responses when fed independently, but when combined, no benefit was evident.

Key Words: enzymatically fermented soybean meal, *Lactobacillus plantarum*, nursery pig,
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210 Effect of diet complexity and specialty protein source on nursery pig performance. A. M. Jones[1,*], J. C. Woodworth[1], J. M. DeRouchey[1], G. E. Fitzner[2], M. D. Tokach[1], S. S. Dritz[1], R. D. Goodband[1], *[1]Kansas State University, Manhattan, [2]Hamlet Protein, Findlay, OH.*

Seven hundred twenty nursery pigs (PIC C-29 × 359, initial BW 5.83 kg and 18-20 d of age) with 10 pigs/pen and 12 replications/treatment were used in a 42-d growth study evaluating diet type (DT; complex vs. simple) and protein source (PS; fish meal, HP300, or HP800) on growth performance. Complex diets contained 20 and 10% lactose, while simple diets contained 12 and 5% lactose in Phases 1 and 2, respectively. Complex diets contained 10% oat meal in both phases, while all diets contained 2% plasma in Phase 1 only. Soybean meal and SID Lys levels were equal within phase by adjusting fish meal, HP300, and HP800. Pens were allotted to 6 treatments in a 2 × 3 factorial arrangement with main effects of DT and PS. Dietary treatments were the fixed effect and block and room served as the random effect. Phase 1 was budgeted at 2.27 kg/pig and Phase 2 was fed thereafter until d-21. A common diet was fed from d 21-42. For the overall treatment period (d 0-21), pigs fed complex had improved G:F (P = 0.040) compared to pigs fed simple diets, but ADG and ADFI were not affected. Overall (d 0–42), no differences in growth were observed among treatments. In summary, the 3 specialty protein sources used resulted in similar growth. The complex diet had small positive benefits on growth during the first 21d; however, the benefits were not evident at the end of the common diet period. The general lack of responses to DT or PS could be related to health, a common ingredient quality issue or lower than expected performance from this facility.

Key Words: diet complexity, nursery pig, protein sources
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211 Evaluation of berberine as an alternative to antibiotics in nursery pig diets. E. E. Scholtz*, *South Dakota State University, Brookings.*

A study was conducted to determine the effects of berberine (plant extract) on growth performance, electrophysiological properties of small intestine mounted in Ussing chambers, and small intestinal histomorphology of weaned pigs. Twenty-four 3 wk-old weaned pigs (average initial BW = 6.35 kg) were obtained in 2 batches of 12 pigs each, and assigned to 3 experimental diets within batch (4 pigs/diet/batch). The diets included a basal diet without or with antibiotics or 3% berberine. The experiment lasted for 7 d, and at the end, body weight gain and feed consumption were determined. The pigs were then euthanized to determine duodenal, jejunal, and ileal trans-epithelial resistance (TER) and small intestinal histomorphology. Data were analyzed using Mixed procedure of SAS with batch as block and pig as experimental unit. There was no effect of

Table 209.

						Probability, P <		
BW, kg	CTRL	LP1	EFS	LP1 + EFS	SEM	LP1 × EFS	LP1	EFS
d 0	5.52	5.51	5.52	5.53	0.012	0.301	0.892	0.392
d 24	10.86	11.04	10.84	10.98	0.136	0.890	0.247	0.751
d 45	22.78	23.42	23.07	23.29	0.276	0.459	0.130	0.782
d 0 to 24								
ADG, g	222	231	222	226	5.8	0.709	0.294	0.662
ADFI, g	303	298	290	292	5.4	0.544	0.789	0.088
G:F	0.734	0.774	0.765	0.773	0.0122	0.210	0.053	0.244
d 0 to 45								
ADG, g	383	398	390	393	6.2	0.332	0.142	0.832
ADFI, g	539	549	534	547	8.5	0.881	0.178	0.658
G:F	0.710[a]	0.723[b]	0.732[b]	0.721[ab]	0.0050	0.021	0.826	0.055