

133 Effects of commercially available soybean cultivars and extrusion temperature on growth performance and nutrient digestibility in nursery pigs. H. Cao*, J. D. Hancock, T. L. Gugle, W. T. Schapaugh, J. M. Jiang, J. S. Park, and J. M. DeRouche, *Kansas State University, Manhattan, KS*.

A total of 288 weanling pigs (average initial BW of 5.0 kg) were used to determine the effects of soybean cultivar and extrusion temperature on growth performance and nutrient digestibility. All pigs were fed the same adjustment diet (1.7% lysine, 5% lactose, and 20% spray-dried whey) to d 7 post-weaning. Then, the pigs were switched to experimental diets with a soybean meal (SBM, control) or dry-extruded (Insta-Pro) whole soybeans (DEWS) from Stein 3973, Stressland, and Flyer soybean cultivars. The extrusion temperature was 125C (under-processed) in Exp. 1 and 145C (adequately processed) in Exp.2. The diets were formulated to 90% of the NRC standard for lysine to accentuate difference in growth performance. In Exp. 1, urease activity of the soybeans (extruded at 125C) ranged from .8 to 1.9. Thus, the soybeans were severely under-processed and supported lower ADG and gain/feed than the SBM + oil control diet (P < .05). There were no differences in growth performance among pigs fed the full-fat soy products (P > .15), but pigs fed the Stressland DEWS had lower digestibilities of DM and N (P < .05) than pigs fed the other DEWS treatments. When extruded at 145C (Exp. 2), urease indexes were .02 to .2. Growth performance was not different for pigs fed SBM + oil vs the DEWS treatments (P > .15), but digestibilities of DM and N were greater in pigs fed DEWS (P < .05). Among the soybean genotypes, pigs fed Stein 3973 soybeans had the greatest gain/feed and digestibility of nutrients (P < .01). In conclusion, our results indicated extrusion temperature is critical to nutritional value of DEWS, and even with adequate heat treatment, differences exist in nutritional value of DEWS from different soybean cultivars.

Key Words: Extrusion, Soybeans, Nursery pig

134 Effects of exotic soybean genotypes on growth performance and nutrient digestibility in nursery pigs. Hong Cao*, J.D. Hancock, R. H. Hines, W. T. Schapaugh, T. L. Gugle, J. M. DeRouche, C. A. Maloney, J. M. Jiang, and D. H. Lee, *Kansas State University, Mahattan, KS*.

A total of 180 weanling pigs (average initial BW of 7.5 kg) were used in a 28-d growth assay to determine the effects of exotic soybean genotypes on growth performance and nutrient digestibility in nursery pigs. All pigs were fed the same adjustment diet (1.7% lysine, 5% lactose, and 20% spray-dried whey) to d 7 post-weaning. Then, the pigs were switched to experimental diets with a soybean meal (SBM) control or dry-extruded (150C, Insta-Pro) whole soybeans (DEWS). The treatments were: 1) SBM + oil; 2) mill run DEWS; 3) low trypsin inhibitor (19 mg/g) DEWS; 4) high protein (53% CP) DEWS; 5) low oligosaccharide (.12% raffinose, and .11% stachyose) DEWS; and 6) high oleic acid (85% of oil as oleic acid) DEWS. The diets were formulated to 1.05% lysine for d 0 to d 11 and .86% for d 11 to 21 (i.e., deficient) to accentuate difference in growth performance. Urease activity of the soybeans ranged from .02 to .16. The SBM + oil control supported similar ADG and gain/feed (P > .15) compared to diets with DEWS. For d 0 to 14, pigs fed modified soybeans had greater gain/feed (P < .04) compared to pigs fed mill run soybeans. However, this advantage was not apparent for d 21 to 35 and overall (P > .15). There were no differences (P > .15) in growth performance or serum urea N among pigs fed the various modified soybean genotypes, although pigs fed low oligosaccharide soybeans had lower digestibilities of DM and N than pigs fed the other soybean genotypes (P < .01). In conclusion, our results indicated that DEWS from genetically modified soybeans were somewhat better in nutritional value than mill-run DEWS, but similar to one another. Thus, the choice of which soybean source to use should depend on price and availability.

Key Words: Extrusion, Soybean, Pig

135 Effects of different fat sources on growth performance of early weaned pigs. M. De La LLata*¹, R.D. Goodband¹, M.D. Tokach¹, J.L. Nelssen¹, S.S. Dritz¹, G.S. Grinstead¹, and J.S. Herbert², ¹*Kansas State University, Manhattan*, ²*Omega Proteins, Hammond LA*.

One hundred and eighty early-weaned pigs (initially 6.6 kg and 21 ± 2 d of age) were used in a 35 d growth trial to evaluate the effects of different fat sources on growth performance. Treatments consisted of a control diet (no added fat) or the control diet with 5% added fish oil, soybean oil, choice white grease, or a combination of 2.5% fish oil and 2.5% choice white grease. The diets were fed in two phases (d 0 to 14 and d 14 to 35 after weaning). Diets were fed in a meal form and formulated to a similar lysine:calorie ratio. From d 0 to 14, pigs fed either soybean oil or fish oil had improved (P < .05) ADG compared to pigs fed the control diet (.385, .381, vs .336g, respectively), with those fed choice white grease or the blend of choice white grease and fish oil having intermediate performance (.349 and .354g, respectively). From d 14 to 35 and from d 0 to 35, neither added fat nor source affected (P > .05) ADG; however, feed efficiency (G:F) was improved (P < .05) approximately 8% for pigs fed any of the fat sources compared with those fed the control diet. Feed efficiency was not affected (P > .05) among pigs fed the diets containing the different fat sources. These results indicate that 5% fish oil, soybean oil or choice white grease can be added to diets for early weaned pigs to improve feed efficiency from weaning to d 35. However, relatively few differences were found between fat sources.

Key Words: Fat source, Early-weaned pigs, Growth

136 Effects of dietary tryptophan on the growth performance of entire male, female, and castrated male pigs between 6 and 16 kg live weight. D. J. Cadogan*¹, R. G. Campbell¹, and J. Less², ¹*Bunge Meat Industries, Corowa, Australia*, ²*ADM, Deacatur, IL*.

One Hundred and fifty pigs (Bunge genotype), comprising equal numbers of entire males, females, and castrated males were blocked by weight and allocated to 5 treatments. Pigs were housed in individual pens and offered ad libitum feed and water throughout the 21 d study. Experimental wheat based diets were formulated to contain 15.0 MJ DE/kg (3,600 kcal DE/kg), 1.55% total lysine (0.92 g/MJ DE available lysine) and crystalline amino acids were used to ensure all other essential amino acids were 115% of requirement. Tryptosine was used to provide five total tryptophan levels (0.22, 0.25, 0.28, 0.31 and 0.34%). Castrates exhibited lower ADG and ADFI when compared to males and females during the 21 d period. ADG and voluntary feed intake were improved by increasing dietary tryptophan, with 0.28% total tryptophan (0.25% available tryptophan) supporting optimum growth for the combined sexes. ADFI was increased to the highest level of tryptophan (linear, P< 0.001: quadratic, P< 0.001), although this effect was more pronounced in entire males and castrates. The results suggest that between 6 and 16 kg, entire male, female and castrated male pigs of improved genotype, have a similar tryptophan requirement of approximately 0.28% or 18% of lysine requirement to support most efficient growth. However tryptophan tended to exert an appetite stimulus on males and castrates, maximising ADG and ADFI at 0.34% or 22% of lysine requirement.

	Tryptophan content of diet					Effects ¹		
	0.22%	0.25%	0.28%	0.31%	0.34%	SEM	L	Q
Wt in (kg)	6.11	6.03	6.14	6.25	6.13	0.289	NS	NS
ADG (kg)	0.407	0.445	0.491	0.486	0.509	0.002	***	***
F:G	1.18	1.13	1.06	1.08	1.07	0.071	NS	*
ADI (kg)	0.473	0.494	0.522	0.529	0.543	0.002	***	***
Tryptophan intake (g/d)	1.05	1.25	1.48	1.66	1.88	0.092	***	***
Wt out (kg)	14.65	15.37	16.44	16.47	16.82	1.464	***	***

¹Linear and Quadratic effect: NS, non significant, P>0.05, *P< 0.05, **P<0.01, ***P< 0.001.

Key Words: Pigs, Threonine, Amino Acids

137 Ascorbic acid synthesis in the fetal, nursing, and weaned pig. S. Ching* and D.C. Mahan, *The Ohio State University, Columbus*.

Ascorbic acid synthesis by the pig has been reported to be absent until 1 wk of age. This study was conducted to determine if ascorbic acid