

124 Effect of soy protein source and plasma protein in phase I diets on nursery pig performance. H. Liu*, I. B. Kim, K. J. Touchette, G. L. Allee, and M. D. Newcomb, *University of Missouri, Columbia.*

A total of 384 weaned pigs were used in two experiments to evaluate the effects of plasma protein and soy protein sources in phase I starter diets on nursery performance. In Exp. 1, 240 pigs (16 ± 2 d and 4.70 kg initial weight) were co-mingled from three sources and housed in an off-site nursery. In Exp. 2, 144 pigs (17 ± 3 d and 5.5 kg initial weight) were weaned to an on-site nursery. Pigs were allotted by weight in a RCB design to a 3 × 2 factorial arrangement of treatments with three soy protein sources: soybean meal (SBM), extruded soy protein concentrate (ESPC), or soy protein concentrate (SPC) and two levels of plasma (0 and 3.5%). Phase I diets were fed 14 days and were formulated to contain 1.56% lysine and 0.86% sulfur amino acids. All diets contained 15.0% lactose and 1.75% spray dried blood meal. Phase II diets were fed from d 14 to 28 and phase III diets from d 28 to 42. In both experiments plasma increased (P < .05) ADFI and ADG. In Exp. 1, pigs fed SBM during phase I had greater (P < .01) ADFI and ADG than pigs fed SPC. Pigs fed ESPC had greater ADFI than pigs fed SPC (P < .05). There were no differences between pigs fed ESPC or SBM. In Exp. 2, pigs fed SBM in phase I diets had higher (P < .01) ADG, ADFI (P < .01) and G/F (P < .05) than pigs fed SPC and higher ADG (P < .05) and ADFI (P < .01) than pigs fed ESPC. Dietary treatments in phase I had no effect on phase II and phase III pig performance. These results suggest that SBM can be used as the major amino acid source in phase I nursery diets, thereby reducing feed cost with no detrimental effects on pig performance 42 d post weaning.

Key Words: Weaned pigs, Soy protein, Plasma protein, Soybean meal

125 Apparent Ileal Digestibility of Weanling Pigs Fed Diets Supplemented with Fishmeal as a Protein Source. S. W. Kim*, H. H. Stein, and R. A. Easter, *University of Illinois, Urbana.*

Eight female weanling pigs fitted with simple T cannulas were used to measure the apparent ileal amino acid digestibility values for four fish meal products: select Menhaden and IPC700*, IPC775*, and IPC790* (*International Proteins Inc., St. Paul, MN). A 4×4 Latin square design (four pigs, four treatments and four sampling periods) was replicated twice. Plastic cannulas, 10 mm id, were surgically installed in the terminal ileum 14d postpartum and pigs were allowed to suckle their dams until weaned at 3 wks-of-age. Each diet was fed for 7d. Apparent amino acid digestibility calculations were based on the use of chromic oxide as an external marker. The experimental diets were each formulated to contain 16% fish meal for each of the products. Synthetic amino acids were added to bring the diet total to 90% of the NRC (1988) requirements. Starch, lactose and glucose were used as the energy sources. Diets were offered ad libitum. The apparent ileal amino acid digestibility values for weanling pigs were consistently better (p<.05) for the three test fish meals compared to control, select Menhaden fish meal, except (p>.10) for isoleucine and tryptophan. Among the three test fish meal products, the digestibility values for IPC790 and IPC775 were higher (p<.05) than those of IPC700 for lysine, leucine and arginine. The IPC790 had higher digestibility values for proline, isoleucine and tryptophan than IPC775. As the pigs grew there was a tendency for digestibility to increase with the highest digestibility values during the third week post-weaning.

(%)	select Menhaden	IPC700	IPC700	IPC790
THR	48.6±3.15 ^b	49.8±2.33 ^{ab}	56.0±3.28 ^{ab}	56.7±3.29 ^a
CYS	47.3±3.75 ^{bc}	43.9±3.45 ^c	53.7±3.92 ^{ab}	57.2±3.66 ^a
MET	71.5±3.18 ^c	75.2±2.40 ^{bc}	84.7±1.71 ^a	76.7±2.26 ^b
LYS	67.0±3.14 ^b	68.1±3.41 ^b	75.0±2.41 ^a	75.5±2.17 ^a
TRP	63.4±2.94 ^{ab}	64.2±2.21 ^{ab}	59.9±3.56 ^b	68.3±3.26 ^a
Avg	51.4±3.11 ^b	54.3±2.93 ^{ab}	58.9±2.88 ^a	60.3±3.07 ^a

P < 0.05.

Key Words: Fish Meal, Weanling Pigs, Apparent Amino Acid Ileal Digestibility

126 The effect of increasing putrescine or spermidine on growth performance of the segregated early-weaned pig. J. R. Bergstrom*, J. L. Neissen, M. D. Tokach, R. D. Goodband, and C. J. Samland, *Kansas State University, Manhattan.*

Three hundred and sixty pigs (Newsham Hybrids) were weaned at 14 ± 2 d of age (initially 4.7 ± .9 kg) and used in a 28-d growth assay to determine the influence of dietary polyamines on pig performance. Pigs were blocked by weight and allotted to each of twelve dietary treatments. The control diet was corn-soybean meal based, and contained 20% dried whey, 5% spray-dried animal plasma, 3% select menhaden fish meal, and 1.75% spray-dried blood meal, and formulated to 1.6% lysine, .49% methionine, .9% Ca, and .8% P. Putrescine and spermidine were solubilized in water and sprayed on the diets during a wet-mixing cycle, and provided dietary inclusion levels of 0, .01, .02, .03, .04, and .05% dietary putrescine or spermidine in a 2 × 6 factorial arrangement. These diets were then pelleted with a steam temperature of 43°C. The diets were later analyzed, and found to contain 0, .01, .02, .03, .04, or .05% putrescine or spermidine. The experimental diets were fed from d 0 to 14 postweaning. All pigs were fed a common diet from d 14 to 28 postweaning. No differences in growth performance were observed during the study. Under the conditions used in this experiment, added putrescine or spermidine did not influence growth performance of high-health, SEW-reared pigs fed a complex diet.

Item	Putrescine, %					Spermidine, %						
	0	.01	.02	.03	.04	.05	0	.01	.02	.03	.04	.05
d 0 to 14												
ADG, g	266	272	295	290	263	299	286	295	281	299	306	277
ADFI, g	297	290	295	304	277	303	297	304	295	304	306	266
G/F	.96	.94	1.0	.95	.95	.96	.96	.97	.96	.96	1.0	.95

Key Words: Pigs, Putrescine, Spermidine

127 Effect of spray dried plasma (SDP) on fecal shedding of hemolytic *Escherischia coli* (HEC) and rotavirus by pigs in a segregated early-weaned (SEW) environment. C. M. Cain*, and D. R. Zimmerman, *Iowa State University, Ames.*

The objectives were to determine: 1) the extent of HEC and rotavirus shedding by SEW pigs and 2) the effect of dietary inclusion of 6% SDP on this shedding. Sixteen 11- to 14-day-old crossbred pigs averaging 5 kg BW were randomly allotted from litter and BW outcome groups to control and SDP treatments. The diets were based on corn, soybean meal, and dried whey (20%). The SDP was substituted for casein. Diets were formulated to contain 1.4% lysine and .84% methionine plus cystine, and they did not contain an antibiotic. Pigs were individually penned in .3 x .9 m crates on woven-wire flooring. Room temperature was 29°C and 26.5°C for wk 1 and 2, respectively. Pigs weaned at 11 to 14 days of age and raised in a SEW environment shed both HEC and rotavirus. The SDP did not affect growth performance, but pigs fed SDP had a lower diarrhea score (1=firm, 4=severe) and fewer days of rotavirus shedding, but more days of HEC shedding than the pigs fed the control diet. The concentration of the acute phase protein, α1 acid glycoprotein (AGP) in serum was greatest in pigs fed SDP. These responses suggest that a primary effect of SDP is to interfere with rotavirus infection, but not with HEC infection. This mechanism of response fits the previous observation that weanling pigs demonstrate additive performance responses to SDP and antimicrobials.

Item	Treatments			CV
	Control	SDP	P<	
ADG, g	175	164	.772	44.5
ADFI, g	330	360	.314	33.1
G/F, g/kg	664	617	.470	19.2
AGP, µg/mL	552	709	.002	10.8
Diarrhea score	1.20	1.07	.03	8.7
HEC, d	1.88	3.75	.03	51.1
Rotavirus, d	5.75	3.62	.05	38.2

Key Words: Spray-dried plasma, Rotavirus, Hemolytic E. coli