

straw high in IS fiber (HIS; 1.41% S, 15.63% IS); and corn-soybean meal-21% soybean hulls HS+HIS fiber (2.99% S, 20.80% IS). Gilts were housed in group pens (6 gilts/pen) by dietary treatment to facilitate twice daily estrus detection by a mature boar. On the first day of the second detected estrus, gilts were fitted with an auricular venous catheter to draw blood samples from estrus until 14 d after mating. At estrus, gilts were moved to individual crates and artificially inseminated three times using pooled semen. Daily feed was offered to gilts based on their initial body weight to meet their daily nutrient requirements (NRC, 1998) for ME (avg. = 5910 kcal), protein (avg. = 255 g), and lysine (avg. = 12.5 g). Reproductive tracts of gilts were harvested 32 d post-mating (range = 28 to 35 d). Statistical analysis of data included effects of diet and day of gestation as a covariate. Pregnancy rates were not affected ($P > 0.20$) by diet (9/12 C; 9/10 HS; 10/10, HIS; 9/11 HS+HIS). Number of corpora lutea was not affected by diet (avg. = 14.1; $P > 0.50$). Fertilization rate for gilts fed HS+HIS was lower than for gilts fed C, HS, and HIS (65.1 vs 84.3, 80.3, 76.4%; $P < 0.05$). Number of live embryos was lower for HIS and HS+HIS gilts compared to C and HS gilts (9.9 and 9.1 vs 11.9 and 10.6; $P < 0.05$). Survival rate of embryos was not influenced by dietary treatments (avg. = 97.3%; $P > 0.50$). High levels of dietary S combined with high levels of dietary IS fiber may decrease fertilization rate. However, under the conditions of this experiment, elevated dietary levels of S and(or) IS fiber did not affect ovulation rate or embryo survival rate.

Key Words: Gilts, Embryo Survival, Fiber

167 The optimal true ileal digestible threonine requirement for nursery pigs between 11 to 22 kg body weight. B. W. James^{*1}, M. D. Tokach¹, R. D. Goodband¹, S. S. Dritz¹, J. L. Nelssen¹, and J. L. Usry², ¹Kansas State University, Manhattan, ²Ajinomoto-Heartland Lysine, Chicago, IL.

The objective of this 22-d growth assay was to determine the optimal true ileal digestible Thr:Lys ratio in nursery pig diets to maximize growth performance. A total of 380 pigs were randomly allotted to pens (5 pigs/pen and 7 pens/treatment) within blocks based on initial BW (approximately 11 kg). In a previous experiment, the true ileal digestible Lys requirement for these pigs was determined to be 1.2% and 1.3% for ADG and gain/feed (G:F), respectively. In this experiment, diets were formulated at and below the Lys requirement. The ten dietary treatments consisted of two basal diets (1.1 and 1.2% true ileal digestible Lys; 16.1 and 17.4% CP) with increasing levels of Thr (50, 55, 60, 65, and 70% of Lys). Pigs fed 1.2% true ileal digestible Lys had increased ($P < 0.01$) ADG and G:F compared to pigs fed 1.1% Lys, suggesting that the Lys requirement was greater than 1.1%. Increasing Thr had no effect ($P > 0.07$) on ADG. A Thr \times Lys interaction ($P < 0.04$) was observed for G:F as pigs fed 1.1% Lys had a greater response to increasing Thr than pigs fed 1.2% Lys. Feed efficiency improved (quadratic, $P < 0.01$) for pigs fed increasing true ileal digestible Thr with the greatest improvement observed as the ratio increased to 60 and 65% of Lys for pigs fed 1.1 and 1.2% true ileal digestible Lys, respectively. These results suggest that the optimal true ileal digestible threonine requirement for 11 to 22 kg pigs is 60 to 65% of lysine.

Item	Threonine: Lysine, %				
	50	55	60	65	70
1.1% Lysine					
ADG, g	490	540	494	481	503
G:F	.55	.61	.64	.63	.65
1.2% Lysine					
ADG, g	540	553	540	531	544
G:F	.63	.65	.66	.68	.68

Key Words: Threonine, Lysine, Weanling Pigs

168 The use of soldier fly prepupae as a replacement for blood plasma in phase 1 and 2 nursery diets. C. R. Dove^{*}, G. L. Newton, and D. C. Sheppard, *University of Georgia, Tifton.*

Two studies were conducted to determine if dried soldier fly prepupae (SF) could be used to replace blood plasma (BP) in nursery diets. In study 1, 84 pigs, weaned at 21 d of age, were randomly allotted to dietary treatment. Pigs were housed in an environmentally controlled nursery with ad libitum access to feed and water over the 35 d study. Experimental treatments were: 1) 5% BP during phase 1, 2.5% BP during

phase 2 (PLA); 2) 2.5% BP, 2.5% SF during phase 1, 1.25% BP, 1.25% SF during phase 2 (COMBO); 3) 5% SF during phase 1, 2.5% SFL during phase 2 (SFP). All pigs were fed a common phase 3 diet with no BP or SF. The SF were produced on swine and poultry manure, resulting in over a 50% reduction of manure DM. In study 2, 105 pigs were weaned, housed and managed as in study 1. Dietary treatments were the same, except that dietary Lys, Thr, Trp and Met concentrations were equalized across diets. In both studies, data was analyzed using SAS Mixed Models procedures, with the pen as the experimental unit. In study 1, pigs fed SFP tended to have decreased ADG during phase 1 and had decreased ($P < 0.05$) ADG during phase 2. During phases 1 and 2 of study 1, pigs fed SFP had decreased ($P < 0.05$) ADFI. Pigs fed COMBO had ADG and ADFI similar ($P > 0.1$) to pigs fed PLA during phases 1 and 2. Over the 35 d study, ADG was decreased ($P < 0.05$) in pigs fed SFP compared to those fed PLA, with the COMBO diet being intermediate. ADG for the 35 d study 1 was 383, 369, and 331 g/d for the PLA, COMBO and SFP diets, respectively. Feed efficiency was not affected ($P > 0.1$) by the COMBO or SFP treatments compared to pigs fed PLA in study 1. In study 2, pigs fed SFL had decreased ($P < 0.05$) ADG compared to the PLA or COMBO fed pigs during phase 1. During phase 2 and 3 of study 2, both the SFP and COMBO fed pigs had decreased ($P < 0.05$) ADG compared to the PLA fed pigs. Daily feed intake was decreased ($P < 0.05$) in pigs fed SFP during phases 1 and 2 in study 2 compared to the PLA or COMBO fed pigs. Gain:feed ratio was decreased ($P < 0.01$) in pigs fed the COMBO diet during phase 3 and over the entire 35 d study. The data from these studies indicate that SFP can be used to replace 50% of the BP in phase 1 nursery diets and that supplementation of SF diets with amino acids did not improve pig performance.

Key Words: Pigs, Soldier Fly Prepupae, Growth

169 Efficacy of mannan oligosaccharide supplementation through late gestation and lactation on sow and litter performance. C. V. Maxwell^{*1}, K. Ferrell², R. A. Dvorak³, Z. B. Johnson¹, and M. E. Davis¹, ¹University of Arkansas, Fayetteville, ²MFA, Inc., Columbia, MO, ³Alltech, Nicholasville, KY.

A previous experiment evaluating mannan oligosaccharide (MOS) supplementation to sows in a commercial facility reported improvements in milk immunoglobulin (Ig) levels, d to estrus, birth weight, and weaning weight. This study was conducted to confirm the efficacy of MOS supplemented in a commercial facility during late gestation and throughout lactation on sow and litter performance. The experiment was conducted on a 600-sow farrow-to-wean commercial facility. A total of 318 sows were administered treatments during the last 21 d of gestation and through lactation. Treatments included control sows and MOS-supplemented (5 g of MOS/d) sows. Sows were fed standard diets and treatments were top-dressed by providing a placebo or treatment bolus immediately at feeding. On d 10 after farrowing, litters were scored for scours using a 1 to 5 scale, such that 1 = watery stool and 5 = firm stool. Additionally, a 5-mL milk sample was obtained from 15 sows/treatment prior to the time that pigs nursed and was analyzed for IgA, IgG, and IgM. Sow records from 3 wk after the study was completed were used to determine d to estrus. There was no difference ($P \geq 0.10$) in number of pigs born alive, birth weight, Ig levels, or number of pigs weaned between sows supplemented with MOS and control sows. The percentage of litters with a scour score of 5 was similar between treatments. However, of the litters with scour scores of 1, 2, 3, or 4, 38.7% of these were in the MOS-supplemented group compared to 61.3% in the control group (Chi-square, $P = 0.10$). Although not statistically significant ($P \geq 0.10$), litter weaning weight (55.6 vs 57.5 kg), and d to estrus (6.4 vs 5.9) were improved when sows were supplemented with MOS compared to control sows. Results of this study suggest that MOS supplemented to sows during gestation and lactation may benefit sow and litter performance and warrants further investigation.

Key Words: Pigs, Sows, Mannan Oligosaccharides

170 Effect of increasing corn oil on apparent amino acid digestibility of soybean meal. J. W. Frank^{*} and G. L. Allee, *University of Missouri, Columbia.*

A study was conducted to evaluate the effect of corn oil on apparent digestibility (AD) of amino acids in soybean meal (SBM). This experiment was designed as two - 6 \times 6 Latin Squares using ileal-cannulated pigs (average BW = 74.2 kg). The first diet contained 34.1% SBM (48%