

soybean products were soybean meal (SBM), soy protein concentrate (SPC), soy protein isolate (SPI), and fermented soybean meal (FSBM). Seven weanling barrows (initial BW: 10.9 kg) were fitted with a T-cannula in the distal ileum and allotted to a 7 × 7 Latin square design. Each of the protein sources was included in one diet and a N-Free diet was used to determine endogenous losses. Each period lasted 7 d and digesta were collected from the cannulas on d 6 and 7 of each period. Casein had the greatest ($P \leq 0.05$) SID for most AA, but the SID for Arg, Lys, Thr, and Trp in SPC and SPI were similar to casein. The SID of Arg, Lys, Thr, and Trp in FM were also similar to casein, but the SID for all other indispensable AA and for the mean of the indispensable AA in FM were lower than in casein ($P \leq 0.05$). There were no differences in SID for any AA among FM, SPC, and SPI. Except for Lys, the SID for all indispensable AA in FSBM were not different from FM, SPC, and SPI, and there were no differences in SID between FSBM and SBM. However, the SID for all indispensable AA except His, Lys, Thr, and Trp in SBM were lower ($P \leq 0.05$) than in SPC. The SID for CP and all indispensable AA in SBM except Thr and Trp were also lower ($P \leq 0.05$) than in SPI, but except for Leu and Thr, no differences between SBM and FM were observed. Results from this experiment showed that the SID for most AA in SPC and SPI are comparable to casein and greater than in FSBM and SBM. The SID for most AA in FSBM are also comparable to the SID for AA in FM.

Table 1. Standardized ileal digestibility (%) of AA by weanling pigs

Item	Soybean meal	Soy protein concentrate	Soy protein isolate	Pep Soygen	Fish meal	Casein
Ile	82.9 x	89.8 y	89.6 y	85.8 xy	87.5 xy	95.7 z
Lys	79.2 xy	88.3 yz	90.8 z	77.2 x	87.7 yz	97.3 z
Met	97.3 z	92.2 y	91.7 y	88.3 xy	89.5 xy	98.5 z
Cys	73.4	85.2	82.0	69.7	76.0	84.6
Phe	84.1 x	91.9 y	91.7 y	87.2 xy	87.7 xy	97.4 z
Thr	77.4 x	85.8 xyz	85.0 xyz	78.5 xy	86.9 yz	90.9 z
Trp	84.8 x	87.5 xy	87.9 xy	83.5 xy	88.7 xy	92.0 y
Val	81.9 x	89.5 y	89.3 y	84.3 xy	89.0 y	96.8 z

^{xyz}Means within a row without a common superscript differ ($P < 0.05$).

Key Words: amino acids, digestibility, fermented soybeans

198 Nutritional value of processed fish byproducts for young pigs. A. Rojo*¹, M. Ellis¹, P. J. Bechtel², Y. Bin¹, and E. Castaneda¹, ¹University of Illinois, Urbana, ²USDA/ARS/SARU, Fairbanks, AK.

Two studies were conducted to evaluate the nutritional value of three fishmeals as protein sources in weanling pig diets. Study 1 was conducted as a Latin square design with four treatments: hydrolyzed pollock fish meal (HPF), hydrolyzed salmon fishmeal (HSF), hydrolyzed commercial fishmeal (HCF), and spray dried animal plasma (SDPP). Sixteen 3-wk old pigs were surgically fitted with ileal cannulas and used to measure the apparent digestibility of the four diets, which were switched among the pigs weekly. Compared to SDPP, Lys (86 vs. 86, 82 and 88%, SEM = 4.87) Trp (84 vs. 82, 78, and 80%, SEM=3.70), and Thr (74 vs. 78, 75 and 80%, SEM=3.54) digestibilities were the same ($P > 0.05$) for all fish meals tested (HCF, HPF and HSF, respectively). HPF and HSF had the lowest and highest

digestibilities respectively ($P < 0.05$), for Iso (67 and 92%), Leu (73 and 93%) and Arg (71 and 93%). Study 2 was conducted for 28 d as a RCBD with eight replicates. A total of 96 weaned pigs (7.1 kg BW, 3 wk old) housed in groups of four animals, were used to investigate the effects on growth performance of diets based on 2 of the fishmeals (HCF, HPF) plus a control diet (SDPP). The feeding period was divided into two phases; Phase I, d 0-7, and Phase II, d 8-28. The diets in each phase were corn-soybean meal based, had the same nutrient content (NRC, 1998) and used the digestibility coefficients obtained from Study 1 (3.47 and 3.44 Mcal/kg, 19.0 and 17.0% crude protein, 1.21 and 1.01% apparent digestible lysine, Phase I and II respectively). ADFI during the first week was higher ($P < 0.05$) in pigs fed the SDPP compared to HCF and HPF (0.17, 0.07 and 0.10 kg/d, respectively, SEM=0.009), however, at the end of the experiment, overall ADFI was not different ($P > 0.05$) among the treatments (0.63, 0.56 and 0.58 kg/d, respectively, SEM=0.019). Overall, pigs fed the diet containing SDPP compared to pigs fed HCF and HPF grew faster (0.42 vs. 0.32 and 0.35 kg/d, respectively, SEM=0.012, $P < 0.05$) and had higher G:F ratio (0.66 vs. 0.57 and 0.59 kg/kg, respectively, SEM=0.018, $P < 0.05$). The results of these studies suggest that the fishmeals evaluated were inferior to SDPP in terms of their effect on early post-weaning performance of piglets.

Key Words: fishmeal, growth, weaned pigs

199 The effect of isoleucine in segregated early weaning and transition diets. S. K. Linneen*, S. S. Dritz, M. D. Tokach, J. M. DeRouchey, R. D. Goodband, and J. L. Nelssen, Kansas State University, Manhattan.

Two experiments were conducted to evaluate the effects of isoleucine (Ile) level and source on nursery pig performance. Experiment 1 was arranged as a 2 × 2 factorial with low or high TID lysine (**Lys; 1.30 or 1.56%**) and low or high TID isoleucine (**Ile; 49 or 60% of Lys**). A total of 194 pigs (5.8 kg) were used in a 10-d trial. From d 0 to 10, there were no Lys × Ile interactions ($P > 0.23$). Pigs fed diets containing high Lys had greater ($P < 0.01$) ADG and G:F compared to pigs fed diets containing low Lys. Increasing the Ile:Lys ratio tended ($P = 0.16$) to increase ADG and ADFI from d 0 to 5 with entire response due to increasing Ile for pigs fed the low Lys diets. In Exp. 2, a total of 1,540 pigs (5.6 kg) were used to test the effects of increased dietary Ile using different Ile sources. Treatments included: control (SEW and transition diets with 49 and 52% TID Ile:Lys ratios, respectively), the control with increased Ile from added L-isoleucine, or the control diet with 1.25% blood meal replaced on a lysine basis with poultry meal, soybean meal, or wheat gluten to increase the Ile:Lys ratio to at least 54%. During the SEW period (d 0 to 5), pigs fed the control diets or diets containing added L-isoleucine had improved ($P < 0.05$) ADG and G:F compared with pigs fed the control or diet containing added soybean meal with pigs fed other diets being intermediate. During the transition period (d 5 to 10), pigs fed diets containing added soybean meal had improved ADG (201 vs 179 g/d; $P < 0.05$) compared to pigs fed diets containing poultry meal. From d 0 to 10, there were no differences ($P > 0.05$) in ADG or ADFI; however, pigs fed the diet with added soybean meal had improved ($P < 0.05$) G:F compared to pigs fed the control diet. In conclusion, maintaining an adequate isoleucine level is critical in diets immediately after weaning. L-isoleucine and wheat gluten are possible ingredient alternatives to increase Ile in the SEW diet; however, these ingredients made no difference on growth performance after the SEW period.

Key Words: nursery pig, amino acid, isoleucine