257 Menhaden fish meal replaces animal plasma in Phase 1 diet for weaning pigs. T. L. Veum*, D. W. Bollinger, Liu, and H. Shi, *University of Missouri, Columbia.*

ıssbred pigs (n=144) weaned about 2.5 wk of age (avg 5.4 kg /) were used to evaluate Menhaden fish meal (FM) as a partial :omplete replacement on a total lysine basis for the spray dried mal plasma (AP) in the Phase (P) 1 (d 0 to 14) diet. The four treatments were: (T1) 6% AP (control), (T2) 4% AP + 2.94% l, (T3) 2% AP + 5.88% FM, and T4) 0% AP + 8.82% FM. Other :redients were 30% dried whey (DW), about 41% corn and 5% soybean meal (SM), mineral and vitamin supplements, d, L-lysine-HCl and DL methionine to provide 1.45% total ine, .43% methionine, 3.36 Mcal/kg and 20% CP. All pigs were l the same P2 (d 14 to 28) diet that contained 0% AP, 2.5% FM, ı spray dried blood cells, 20% DW, 51.5% corn, 18.4% SM and pplements as in P1 to provide 1.3% total lysine, .42% ıthionine, 3.40 Mcal/kg and 18.6% CP. For P1, there were linear clines ($P < .01$) in ADFI and ADG with increasing replacement AP with FM. Also, ADG and gain:feed (G:F) in P1 were lower < .05) for T4 compared to the other treatments. For P2, there :re no differences ($P > .2$) in ADFI, ADG or G:F. Overall (d 0 to ·), ADFI, ADG, and BW on d 28, were lower ($P < .01$) for T4 mpared to the other treatments that were not different from ch other ($P > .3$ to .9). In conclusion, when AP is replaced by M, AP can be reduced below 6%, but not less than 2% of the P1 et when no AP is used in the P2 diet, based on l-d growth performance.

	T1	T2	T3	T4
DFI				
d 0-14, g	358[a]	336[a]	320[a]	268[b]
d 0-28, g	538[a]	520[a]	523[a]	476[b]
DG				
d 0-14, g	194[a]	175[a]	166[a]	109[b]
d 0-28, g	310[a]	305[a]	308[a]	256[b]
:F				
d 0-14, g/kg	533[a]	509[a]	512[a]	395[b]
d 0-28, g/kg	574[ab]	583[ab]	588[a]	552[b]

[b]Means differ ($P<.01$).

Key Words: Protein Sources, Weaning Pigs, Performance

258 Spray-dried bovine globulin for early weaned pigs. J. L. Pierce[1]*, G. L. Cromwell[1], M. D. Lindemann[1], H. J. Monegue[1], E. M. Weaver[2], and L. E. Russell[2], [1]*University of Kentucky, Lexington and* [2]*American Protein Corporation, Ames, IA.*

Two experiments involving 247 pigs weaned at 21 ± 2 d of age were conducted to evaluate spray-dried porcine plasma (SDPP), spray-dried bovine plasma (SDBP), and a globulin-rich fraction of bovine plasma on postweaning performance. There were four replicates of four or five pigs/pen (5.6 kg BW, 19.7 d of age) in Exp. 1 and five replicates of six or seven pigs/pen (6.4 kg BW, 22.5 d of age) in Exp. 2. The basal diet (Diet 1) consisted primarily of corn, dehulled soybean meal, soy protein concentrate and dried whey, and was fortified with minerals, vitamins, antibiotics, and $CuSO_4$ (250 ppm Cu). Diets 2 and 3 contained bovine globulin at approximately 50 and 100% of the globulin provided in Diet 4. Diets 4 and 5 contained 8% SDBP or SDPP, respectively. These diets (1.40% lysine, .42% methionine, .49% Na, and 3.24 Mcal of ME/kg) were fed for 14 d and a common, Phase 2 diet (1.2% lysine) was fed thereafter. In Exp. 1, pigs fed bovine globulin or SDPP during the 14-d postweaning period gained faster (174, 223, 254, 194, 266 g/d for Diets 1-5, respectively, $P<.01$) and consumed more feed (286, 352, 391, 336, 451 g/d, $P<.01$) than the controls. Gain and feed intake were increased in pigs fed SDBP, but to a lesser extent than in those fed bovine globulin or SDPP. Feed/gain was not affected by treatment (1.65, 1.60, 1.54, 1.75, 1.69). In Exp. 2, bovine globulin, SDBP, and SDPP all improved growth rate (228, 287, 271, 268, 265 g/d, $P<.05$) and feed intake (333, 389, 380, 404, 425 g/d, $P<.01$), but not feed/gain (1.61, 1.57, 1.62, 1.63, 1.68). These data indicate that proteins in the globulin-rich fraction are effective in improving postweaning performance in young pigs. A level of bovine globulin that is equivalent to that provided by 4% SDBP appears to be as effective as the level of bovine globulin supplied by 8% SDBP.

Key Words: Pig, Plasma Protein, Globulins

meal diets

259 Evaluation of the total sulfur amino acid requirement of finishing pigs. J. A. Loughmiller*, R. D. Goodband, M. D. Tokach, J. L. Nelssen, J. W. Smith II, and J. R. Bergstrom, *Kansas State University, Manhattan.*

A total of 64 gilts (PIC Line 326 x C15; initially 54 kg) were used in a 64 d growth trial to determine the total sulfur amino acid (TSAA) requirement of finishing pigs. Treatments were arranged in a 2 x 3 factorial with main effects of dietary lysine (.70 and .55% total, .55 and .44% apparent digestible) and TSAA (60, 65 and 70% of total lysine). The control diets were cystine-deficient, grain sorghum-soybean meal based with added synthetic lysine, methionine, and threonine. All amino acids except cystine were formulated to meet or exceed current requirement estimates. DL-methionine was added to achieve the TSAA:lysine ratios. Lysine intake was 21.1 and 17.0 g/d for the respective lysine levels, ($P< .0001$). A lysine x TSAA interaction ($P < .10$) was observed for ADG. The TSAA:lysine ratio had no affect on other response criteria. A positive lysine main effect was detected for all response criteria. Plasma urea N levels on d 21 and 64 were not influenced by TSAA levels. In this trial, increasing the TSAA:lysine ratio above 60% had no influence on finishing pig performance or carcass traits

Lysine, %	70			55				TSAA (P <)	
TSAA, % of Lysine	60%	65%	70%	60%	65%	70%	CV	Linear	Quadratic
Item									
ADG, kg	.84	.89	.90	.83	.80	.76	7.8	.65	.54
ADFI, kg	2.88	3.05	3.11	3.15	3.15	2.96	7.0	.81	.34
G/F	.27	.27	.27	.24	.22	.24	13.5	.94	.18
10th rib BF, mm	24.9	26.4	26.7	29.2	28.4	29.7	12.3	.47	.87
LMA, cm^2	38.5	37.2	37.7	37.2	35.1	35.5	11.1	.49	.47

Key Words: Pigs, Cystine, Methionine

260 Effect of dietary spray-dried plasma protein on postweaning pig growth performance -the optimal inclusion level and feed allowance. H. H. Stein, R. A. Easter, W. Guan, D. Li, F. Chi*, E. M. Weaver, and L. E. Russell. *Univ. of IL, Urbana, Beijing Agri. Univ., China and Amer. Prot. Co., Ames, Iowa.*

Two studies have been conducted to evaluate the effects of spray-dried plasma protein (SDPP) inclusion level and feed allowance on postweaning pig growth performance. In the first experiment, 180 pigs weaned at 21 d were allotted to 6 treatments (2 x 3 factorial). Treatments were low (3.75%) or high (7.5%) dietary SDPP and three levels of feed allowance (0.68, 1.36, or 2.72 kg per pig) of the Phase I diet. Phase II diets were offered to a total feed intake (Phase I + Phase II) of 5.45 kg. Thereafter, a common phase III diet were fed until 42 d postweaning. On average it took 4 d for pigs to consume 0.68 kg, 7 d to consume 1.36 kg, and 14 d to consume 2.72 kg of the Phase I feeds. There was no difference ($P > .5$) between two levels of SDPP (3.75% vs. 7.5%) on daily gain, daily feed intake, or feed efficiency. However, an improvement ($P < .01$) was observed in average daily gain and feed intake when feed allowance was increased over the initial 0 to 14 d period. At d-42, daily gain, feed intake, gain to feed ratio, and final body weight were the lowest ($P < .01$) when pigs were fed the low SDPP diet for the shortest period (3.75% SDPP and 0.68 kg). In the second experiment, 324 pigs weaned at 30 d were allotted to nine treatments (3 x 3 factorial). The experimental procedure was similar to Exp. I including three feeding allowance (0.7, 1.4, or 2.8 kg per pig) and three levels of SDPP (0, 3.75, or 7.5%) in Phase I diet. Pigs were fed experimental diet for 35 d and feed cost per kg of gain calculated. Over all, daily gain and feed intake were increased ($P < .01$) as SDPP inclusion rate increased. Feed efficiency was improved by dietary SDPP ($P < .05$). Feed cost per gain was the lowest in pigs fed 7.5% SDPP and 2.8 kg allowance as compared to the rest of the treatments. This data indicates that both the level of SDPP and the duration of feeding are important in determining the response to SDPP. If SDPP containing feed is removed too soon much of the plasma advantage is lost. Finally, increasing the exposure to SDPP beyond the typical Phase I period of 7 d may be warranted.

Key Words: Pig, Spray-Dried Plasma Protein, Inclusion Rate, Feeding Allowance