58 **Spray dried porcine plasma protein enhances feed intake, growth rate and efficiency of gain in mice.** J. E. Thomson*, E. E. Jones and E. J. Eison. North Carolina State University, Raleigh.

total of 108 mice were weaned at 21±1d and allotted to one of ur dietary treatments: 1) control (modification of AIN-76 ni-purified diet, dried skim milk replacing casein), 2)control 4% spray dried porcine plasma protein (SDPP), 3) control + 8% PP, and 4) control + 12% SDPP. Lysine, methionine, threonine, d sodium were held constant across treatments. ADG for males creased with level of SDPP up to 8% from d 0-7, 7-14 and for o entire 21d. ADG was greater for females receiving 12% SDPP ran control females from d 0-7. ADG for males d 14-21 was not fected by treatment. ADFI was similar for males and females d increased linearly (p<.0002) with level of SDPP in all riods. G/F increased with increasing levels of SDPP from d 0-7 <.0002) and d 0-14 (p<.05). From d 14-21, however, G/F creased with increasing SDPP level (p<.005). Female G/F sponded only to the 12% level of SDPP from d 0-7 (quadratic sponse, p<.05), while male G/F increased linearly with SDPP vel. G/F for the entire trial was unaffected by treatment ong females, but, male G/F increased linearly with SDPP vels. Total wet livor weight increased quadratically with creasing SDPP levels for males (891, 1446, 1664, 1674 mg; .03) and females (969, 946, 1023, 1201 mg; p<.02). Livor ight·g body weight^{-1} was not affected by treatment in females =.24). The effect of treatment on liver weight·g body weight$^{-.75}$ proached significance (p<.07) in females. Male livor weight·g dy weight^{-1} and liver weight·g body weight$^{-.75}$ responded adratically to increasing SDPP levels (p<.03, p<.03). ididymal and ovarian fat pads were unaffected by treatment. ese results indicate that mice respond to dietary inclusion SDPP with increases in ADFI, ADG and G/F during the period mediately post weaning and may, therefore, serve as propriate models for pig response to SDPP. Reductions in G/F en d 14-21 may have been the result of greater hepatic energy mand.

Key Words: Mice, Porcine plasma, Livor weight

339 **Optimal dietary sequence in a phase feeding program for early weaned (9±1 d) pigs.** S.S. Dritz*, J.L. Nelssen, M.D. Tokach, R.D. Goodband, K.Q. Owen, L.J. Kats, and B.T. Richert. Kansas State University, Manhattan.

Two hundred forty weanling pigs (initially 3.27±.68 kg BW and 9±1 d) were used in a 21 d growth trial to evaluate the influence of four dietary sequences on growth performance. The trial was designed as a randomized complete block with five replicates of four dietary sequences (12 pigs/pen). Three diets were used to form the four dietary sequences. Diet A was formulated to contain 1.7% lysine, 7.5% spray-dried porcine plasma (SDPP), 1.75% spray-dried blood meal (SDBM), 3% spray-dried egg protein, 20% dried whey, and 10% dried skim milk. Diet B was formulated to contain 1.4% lysine, 2.5% SDPP, 2.5% SDBM, and 20% dried whey. Diet C was formulated to contain 1.25% lysine, 2.5% SDBM, and 10% dried whey. The four dietary sequences were as follows AAB, AAC, ABB, and ABC with each letter indicating diet fed d 0 to 7, d 7 to 14, and d 14 to 21 postweaning, respectively. Data were analyzed using a repeated measures analysis of variance. From d 0 to 7 postweaning, ADG, ADFI, and feed efficiency (G/F) were 112 g, 134 g, and .836, respectively. Pigs fed diet B from d 7 to 14 had numerically lower ADG than pigs that remained on diet A. Pigs fed diet B from d 14 to 21 had higher ADG (P<.05) compared to pigs fed diet C. Pigs fed dietary sequences AAB or ABB were 11% heavier on d 21 (P<.05) than pigs fed dietary sequences AAC or ABC. In conclusion, dietary sequences AAB and ABB provided identical performance d 0 to 21 postweaning; however, utilization of a transition diet (B) from d 7 to 14 postweaning substantially reduced feed cost/kg of gain for pigs weaned at 9 d of age.

		Dietary Sequence				
Item		AAB	AAC	ABB	ABC	CV
d 7 to 14	ADG, g[a]	275	279	252	221	14.0
	ADFI, g	298	295	302	284	7.7
	G/F	.923	.946	.834	.778	18.9
d 14 to 21	ADG, g[b]	342	266	363	292	14.0
	ADFI, g[c]	372	335	436	378	7.7
	G/F	.919	.794	.832	.772	18.9
d 21	Wt, kg[b]	8.39	7.83	8.39	7.79	9.4
d 0 to 21	Cost/kg gain, $[d]	.730	.695	.615	.509	

[a]AAB or AAC vs ABC (P<.05). [b]AAB or ABB vs AAC or ABC. (P<.05).
[c]ABB vs AAB, AAC, or ABC (P<.05) ABC vs AAC (P<.09).
[d]Diet costs: A, $.88/kg; B, $.44/kg; C, $.22/kg.
Key words: Pigs, Dietary Sequence

340 **The effect of increasing level of lactose in a porcine plasma-based diet for the early weaned pig.** K.Q. Owen, J.L. Nelssen, M.D. Tokach, R.D. Goodband, S.S. Dritz, and L.J. Kats*. Kansas State University, Manhattan.

A total of 367 weanling pigs (initially 5.3 kg and 21 d of age) was used in a 28 d growth assay to determine the appropriate level of lactose needed in a phase I diet containing spray-dried porcine plasma (SDPP). Pigs were blocked by weight and randomly assigned to one of six experimental diets: a positive control, or five diets calculated to contain 7, 11, 15, 19, or 23% lactose. The positive control diet was a high nutrient density diet (HNDD) containing 7.5% SDPP, 1.75% spray-dried blood meal (SDBM), and 20% dried whey. The five experimental diets were achieved by adding lactose to a basal diet containing 10% dried whey, 7.5% SDPP, and 1.75% SDBM. Total lactose levels of 7, 11, 15, 19, or 23% were achieved by adding 0, 4, 8, 12, or 16% lactose, respectively, to the basal diet. Dried whey was assumed to contain 72% lactose. All diets contained 1.5% lysine, .9% calcium, and .8% phosphorus. Pigs were fed these diets in a pelleted form from d 0 to 14 postweaning. On d 14, all pigs were switched to a common phase II diet formulated to 1.25% lysine and containing 10% dried whey and 2.5% SDBM. Pigs were fed this diet in a meal form for the remainder of the trial (d 14 to 28 postweaning). During phase I, a linear increase (P<.01) in ADG, ADFI, and G/F was observed. Pigs receiving the diet containing 23% lactose had higher ADG (P<.01) and ADFI (P<.10) than pigs receiving the HNDD. However, there were no differences in G/F between pigs fed these two treatments. During phase II, there were no differences in ADG and G/F, but a linear improvement (P<.05) was observed for daily feed intake with increasing lactose fed in phase I. During the entire trial, a linear improvement (P<.01) was observed in ADG, ADFI, and G/F with increasing lactose level. Furthermore, pigs consuming the diet containing 23% lactose had higher ADG (P<.05) and consumed more feed per day (P<.05) when compared to pigs offered the HNDD. In conclusion, starter pig performance was improved linearly as lactose level increased from 7 to 23% in a nursery diet containing spray-dried porcine plasma.

			Dietary Lactose, %					
Item		HNDD	7	11	15	19	23	CV
d 0 - 7	ADG, g[a,b]	159	133	151	165	172	192	20.4
	G/F[a]	.83	.67	.85	.85	.86	.90	14.5
d 0 - 14	ADG, g[a,b]	231	200	209	245	236	263	12.5
	G/F[a]	.88	.80	.81	.90	.87	.91	13.6
d 14 - 28	ADG, g	458	440	472	458	449	485	9.3
	G/F	.66	.64	.67	.65	.64	.66	5.0
d 0 - 28	ADG, g[a,b]	349	322	340	354	345	376	7.3
	G/F[a]	.72	.68	.71	.72	.70	.72	3.6

[a]Linear effect of lactose (P<.01). [b]HNDD vs 23% lactose (P<.05).

Key Words: Lactose, Pigs, Growth performance.

341 **The effect of increasing dietary methionine in a plasma-based diet on performance of the early weaned pig.** K.Q. Owen*, J. L. Nelssen, R. D. Goodband, M. D. Tokach, L. J. Kats, and K. G. Friesen. Kansas State University, Manhattan.

A total of 216 pigs (initially 4.9 kg and 21 d of age) was used in a 35 d growth trial to determine the effect of dietary methionine on growth performance for the early weaned pig when fed a porcine plasma-based diet. Pigs were blocked by weight, ancestry, and sex in a randomized complete block design resulting in six pigs per pen and a total of six pens per treatment. Experimental diets were fed from d 0 to 21 postweaning (phase I). The control diet was corn-soybean meal based, included 10% spray-dried porcine plasma (SDPP), 20% dried whey, 3% lactose, and 1.75% spray-dried blood meal (SDBM), and formulated to contain 1.6% lysine and .28% methionine. DL-methionine replaced sucrose in the control diet to achieve the experimental dietary methionine levels of .28, .32, .36, .40, .44, and .48%. Corresponding digestible methionine levels were .225, .265, .305, .345, .385, and .425%. Each diet contained .52% cystine and .07% added choline. On d 21, all pigs were switched to a common phase II (d 21 to 35 postweaning) diet containing 10% dried whey and 2.5% SDBM and formulated to contain 1.25% lysine and .30% methionine. Blood samples were collected on d 7, 14, and 21 to determine plasma urea N (PUN). During phase I, ADG, ADFI, and feed efficiency (G/F) were improved quadratically (P<.01) when dietary methionine increased with maximum performance being obtained between .40 and .44% dietary methionine. Average daily gain was not affected during phase II. However, during phase II, a quadratic (P<.10) response was observed for ADFI and G/F due to methionine level fed during phase I. On d 7 and 14, PUN was reduced quadratically (P<.01) as dietary methionine increased. Pigs fed .40% dietary methionine had the lowest numeric PUN concentration on d 14 compared to the other treatments. Cumulative (d 0 to 35) ADG and ADFI were improved quadratically (P<.01) and maximized between .40 and .44% dietary methionine. In conclusion, a porcine plasma-based diet must contain .40 to .44% dietary methionine to maximize growth performance from d 0 to 14 postweaning.

		Dietary Methionine, %						
Item		.28	.32	.36	.40	.44	.48	CV
d 0 - 14	ADG, g[a,c]	180	263	309	318	346	313	9.2
	G/F[a,c]	.80	.90	.97	.99	.98	.97	5.4
d 0 - 21	ADG, g[a,c]	244	336	358	372	395	363	7.7
	G/F[a,c]	.76	.85	.86	.91	.89	.87	4.8
d 21 - 35	ADG, g	467	508	485	499	477	489	11.9
	G/F[b,d]	.63	.61	.54	.57	.57	.57	8.3
d 0 - 35	ADG, g[a,c]	336	404	408	422	427	413	8.2
	G/F	.68	.71	.68	.71	.71	.70	4.3
d 7	PUN, mg/dL[a,c]	13.16	7.68	5.87	5.45	5.48	5.34	39.6
d 14	PUN, mg/dL[a,c]	8.79	7.42	5.67	4.45	4.95	4.48	20.1
d 21	PUN, mg/dL[a]	10.25	8.72	8.61	7.28	9.33	6.60	22.1

[a,b]Linear effect of dietary methionine (P<.01) and (P<.10), respectively.
[c,d]Quadratic effect of dietary methionine (P<.01) and (P<.10), respectively.
Key Words: Methionine, Pigs, Growth performance.