

PSIV-12 Effects of Digestible Lysine Level on Growth Performance of Nursery Pigs.

Henrique S. Cemin¹, Luke A. Swalla¹,
Jamie L. Pietig¹, Sharlie A. Hansen¹,
Ernie L. Hansen¹, ¹Hubbard Feeds

Abstract: An experiment was conducted to determine the optimal standardized ileal digestible (SID) Lys level for growth performance of nursery pigs. A total of 980 pigs (PIC 337 × Camborough; initial BW = 5.4 kg), placed in pens with 28 pigs each, were used in a 42-d trial. There were 5 treatments consisting of 1.15, 1.25, 1.35, 1.45, or 1.55% SID Lys. Experimental diets were fed from d 0 to 21 followed by a common corn-soybean meal-based diet (1.30% SID Lys) from d 21 to 42. Pigs were weighed weekly to calculate ADG, ADFI, and G:F. Data was analyzed with SAS MIXED procedure. From d 0 to 21, increasing the SID Lys level resulted in a linear ($P < 0.01$) ADG, G:F, and BW improvement. Because of the linear nature of the response, the break-point could not be determined. From d 21 to 42, when pigs were fed a common diet, linear ($P < 0.05$) ADG and G:F responses were observed; pigs previously fed the lower SID Lys levels had improved performance. This compensatory response resulted in no evidence for differences ($P > 0.10$) in overall (d 0 to 42) ADG and final BW, although there was a linear ($P = 0.004$) G:F improvement. In conclusion, increasing SID Lys level linearly improved performance; however, pigs fed low SID Lys levels presented compensatory growth and obtained similar performance in the overall nursery period.

Table 1. Effects of standardized ileal digestible (SID) Lys on growth performance of nursery pigs¹

Item ²	SID Lys, %					SEM	Probability, $P <$	
	1.15	1.25	1.35	1.45	1.55		Linear	Quadratic
BW, kg								
d 0	5.5	5.4	5.4	5.4	5.4	0.02	0.162	0.954
d 21	11.8	12.0	12.4	12.6	12.8	0.14	0.001	0.858
d 42	24.4	24.4	24.9	24.5	24.8	0.29	0.269	0.691
d 0 to 21								
ADG, g	298	307	326	333	340	6.68	0.001	0.537
ADFI, g	338	337	342	338	344	6.23	0.547	0.882
G:F, g/kg	883	910	953	986	987	10.32	0.001	0.127
d 21 to 42								
ADG, g	589	582	586	566	565	9.50	0.048	0.725
ADFI, g	774	777	787	764	763	12.04	0.397	0.391
G:F, g/kg	762	749	746	741	741	6.17	0.016	0.330
d 0 to 42								
ADG, g	441	441	454	446	449	6.41	0.290	0.517
ADFI, g	552	551	561	547	547	7.11	0.513	0.428
G:F, g/kg	800	800	810	818	821	5.94	0.004	0.899

¹ A total of 980 pigs were used with 28 pigs per pen and 7 replicates per treatment. Experimental diets were fed from d 0 to 21 and a common diet was fed from d 21 to 42.

² BW = body weight; ADG = average daily gain; ADFI = average daily feed intake; G:F = gain-to-feed ratio.

Keywords: amino acid; compensatory; nursery

PSIV-9 Effect of Increasing the Level of a Modified Corn Protein on Nursery Pig Growth Performance, Feed Efficiency, and Fecal

Dry Matter. Alan J. Warner¹, Keith Mertz²,
Jason C. Woodworth¹, Joel M. DeRouchey¹,
Mike D. Tokach¹, Robert D. Goodband¹,
Jordan T. Gebhardt¹, ¹Kansas State University,
²Cargill Starches, Sweeteners & Texturizers

Abstract: A total of 360 barrows (DNA Line 200×400; initially 6.1±0.05 kg) were used in a 38-d study to evaluate the effects of increasing levels of a modified corn protein product on nursery pig growth performance and fecal dry matter. Upon arrival to the nursery research facility, pigs were randomly assigned to pens (5 pigs/pen) and pens were randomly allotted to 6 dietary treatments (12 pens/treatment). Experimental diets were fed in 2 phases. Phase 1 (d 0-10) diets were formulated to contain 3, 6, 9, 12, or 15% of a modified corn protein or 6% enzymatically treated soybean meal (ESBM). Additions of the modified protein product and ESBM were reduced by 50% for phase 2 (d 10 to 25) diets and were: 1.5, 3.0, 4.5, 6.0, 7.5, and 3.0%, respectively. Nutrient loading values were provided by the supplier and diets were formulated to maximize L-Lysine HCl while keeping SID Lys:CP and SID AA:Lys similar across treatments. A common phase 3 diet was fed from d 25-38. During the experimental period (d 0-25), ADG (quadratic, $P = 0.030$) and ADFI (quadratic, $P = 0.036$) increased, and G:F worsened (linear, $P = 0.006$) as the amount of modified corn protein increased. For the overall experiment (d 0-38), ADG (quadratic, $P = 0.028$) and ADFI (quadratic, $P = 0.032$) increased then decreased and G:F tended to decrease (linear, $P = 0.066$) with increasing modified corn protein. There was a marginally significant treatment×day interaction (quadratic, $P = 0.064$) where fecal DM tended to increase ($P = 0.051$) on d 25 as the level of the modified corn protein was increased, but no evidence for change on d 10 ($P > 0.10$). These data suggest that the modified corn protein tested in this trial may be an alternative protein source to consider for nursery pig diets, when fed up to 12% in phase 1 and 6% in phase 2.

Table 1. Effects of increasing a modified corn protein on nursery pig growth performance¹

	ESBM		Modified corn protein, % ²					<i>P</i> = ³	
	6.0	3.0	6.0	9.0	12.0	15.0		Linear	Quadratic
d 0 to 10:	3.0	1.5	3.0	4.5	6.0	7.5			
d 10 to 25:									
d 0 to 25 (Experimental period)									
ADG, g	283	281	302	286	296	270	0.293	0.030	
ADFI, g	363	358	383	375	389	361	0.703	0.036	
G:F, g/kg	781	786	791	763	761	748	0.006	0.784	
Fecal DM, %									
d 10	19.5	23.1	21.8	21.0	23.3	21.8	0.715	0.488	
d 25	23.7	23.0	24.0	24.2	24.4	21.7	0.493	0.051	

¹SEM for d 0 to 25 ADG, ADFI, and G:F was 10.5, 11.1, and 14.7, respectively; for d 0 to 38 was 9.3, 12.7, and 7.7, respectively and for d 10 and 25 Fecal DM was 1.13 and 1.13, respectively.

²Cargill, Inc., Blaire, NE.

³Linear and quadratic effects of modified corn protein level. All pairwise comparisons between treatments within response ($P > 0.05$).

Keywords: corn, growth, feed efficiency, protein source, nursery pig

PSIV-15 Impact of Wean Age and SID Lysine Level on Performance in Lactation. Grant I. Petersen¹,

Katherine McCormick¹, Mike E. Johnston¹,

¹United Animal Health

Abstract: With genetic improvement, sows are having larger litters and nursing more pigs. The wean age of these piglets can impact sow feed intake and piglet wean weight. Additionally, Lys level can impact sow and piglet growth. This study was performed to assess whether the addition of greater standardized ileal digestible (SID) Lys improves sow and litter performance for 2 wean ages. Four hundred thirty-two DNA F1 females (average parity 2.4) were randomly allotted within group and entry weight at farrowing to 1 of 4 dietary treatments. Treatments were arranged in a 2 x 4 factorial with wean age (15.5 and 24.5 d) and lactation diet SID Lys (0.87, 0.94, 1.02 and 1.10%). Sows were weighed entering and exiting the farrowing room. Feed disappearance was calculated as the total amount of feed provided to the sow during lactation. A post-farrow weight model was utilized to assess true weight loss in lactation. Litters were standardized within 24 h of birth. Data were analyzed as a randomized complete block design with fixed effects of SID Lys and wean age, and random effect of replicate. Average daily feed intake was increased ($P < 0.05$) in the sows weaning older age compared with younger age piglets (6.52 vs. 5.87 kg respectively). There was a tendency ($P < 0.10$) for an interaction between wean age and maternal Lys level on piglet wean weight as higher Lys increased wean weight (0.29 kg) in the older wean age but had no improvement in the younger wean age. Sow weight loss was decreased ($P < 0.05$) in sows weaning younger piglets compared with sows weaning older piglets (4.26 vs. 11.02 kg weight loss, respectively). These data show that greater levels of SID Lys to target 65 g/d in lactation can improve wean weight for later weaning sows.

Keywords: lysine, sow, wean age