the apparent ileal digestibility coefficient (AID) for CP and all indispensable AA except Lys, Met, and Val were higher ($P < 0.05$) for pigs fed at M2 as compared to M1. Higher AID for M2 compared to M1 were also calculated for Cys, Gly, Ser, and Tyr ($P < 0.05$) while there were no differences ($P > 0.05$) between the two feeding levels for the remaining dispensable AA. Likewise, there were no differences in AID for CP or any of the AA between M2 and M3 ($P > 0.05$). The endogenous flow to the distal ileum calculated as g/kg DM intake decreased linearly ($P < 0.01$) for CP and all AA except Pro as feed intake increased from M1 to M3. Likewise, the standardized ileal digestibility coefficients (SID) for diet 1 decreased linearly ($P < 0.05$) for CP and all AA except Arg, Trp, Asp, Pro, and Tyr as feed intake increased from M1 to M3. In addition, the SID for CP and all indispensable AA except Arg, His, and Trp were lower ($P < 0.05$) at M3 than at M2. The current results demonstrate that the level of feed intake significantly influences the calculated values for AID, SID, and endogenous losses. Therefore, pigs used to measure AA digestibility coefficients and endogenous losses should be fed at a level that is close to what is used under practical conditions.

Key Words: Amino Acid Digestibility, Feed Intake, Endogenous Losses

183 Effects of lysine level fed from 10 to 20 kg on growth performance of barrows and gilts. N. A. Lenehan*[1], S. S. Dritz[1], M. D. Tokach[1], R. D. Goodband[1], J. L. Nelssen[1], and J. L. Usry[2], [1]*Kansas State University, Manhattan.*, [2]*Ajinomoto-Heartland Lysine, Chicago*.

A total of 1,440 pigs (initially 10.2 kg and 21 d after weaning) were used in a 21-d growth assay to determine the optimal lysine level to maximize growth performance of 10 to 20 kg pigs. Pigs (PIC) were blocked by gender in a completely randomized block design with 24 pigs per pen and 2 pens per experimental unit. Five levels of true ileal digestible lysine (1.1, 1.2, 1.3, 1.4 and 1.5%) were fed from d 21 to 42 after weaning. Total lysine levels were 1.24, 1.34, 1.44, 1.54, and 1.64%. All diets had the same soybean meal level with crystalline amino acids added to achieve the lysine levels while maintaining a minimum ratio of all other amino acids. Pigs were weighed and feed intake determined weekly. Both ADG and gain/feed improved linearly ($P < 0.01$) with increasing dietary lysine. The greatest response in growth performance was obtained as true digestible lysine increased to 1.4%. The results of this trial indicate that pigs weighing between 10 and 20 kg require approximately 1.4% true digestible lysine.

	True digestible lysine, %						P<	
Item	1.1	1.2	1.3	1.4	1.5	SEM	Lin.	Quad.
ADG, g	468	476	494	518	515	14	0.01	0.76
ADFI, g	706	697	704	710	710	17	0.71	0.78
Gain/feed	0.66	0.68	0.70	0.73	0.73	0.01	0.001	0.24

Key Words: Pigs, Lysine, Growth

184 Effects of feeding commercially grown gilts below or above the lysine requirement in early and late finishing on overall performance. R. G. Main, S. S. Dritz, M. D. Tokach, R. D. Goodband, and J. L. Nelssen, *Kansas State University, Manhattan*.

Our objective was to determine the effects of feeding gilts (PIC 337 × C22) below (d 0 to 27 = 2.75 g, d 27 to 55 = 2.25 g total lysine/Mcal ME) or at (d 0 to 27 = 3.30, d 27 to 55 = 2.75 g lysine/Mcal ME) the estimated lysine:calorie ratio required for optimal performance in early finishing (32 to 77 kg). Additionally, we observed the effects of feeding gilts within each early finishing treatment below, at, or above (1.75, 2.25, 2.75 g lysine/Mcal ME, respectively) the estimated lysine requirement in late finishing (77 to 115 kg). Forty-two pens (1,154 gilts; initially 32.8 ± .8 kg) were used in a split-plot design. Diets were corn-soybean meal based with 6% choice white grease. Lysine:calorie ratios were attained by adjusting corn and soybean meal. No crystalline lysine was used. In early finishing, gilts fed at the lysine requirement had improved ($P < 0.01$) ADG (791 vs. 827 ± 7 g/d), feed efficiency (0.447 vs. 0.467 ± 0.002) and income over marginal feed cost (IOMFC; $25.65 vs. 26.55 ± 0.26/gilt). In late finishing, increasing lysine:calorie ratio improved (quadratic, $P < 0.02$) ADG (768, 834, 843 ± 9 g/day), feed efficiency (0.342, 0.370, 0.376 ± 0.003), and lean percentage (54.7, 55.7, 55.9 ± 0.12%). Gilts fed below the lysine requirement in early finishing had improved ($P < .01$) feed efficiency (0.368 vs. 0.357 ± 0.002) and feed cost per kg of gain ($0.355 vs. 0.365 ± .002) in late finishing, as compared to gilts fed adequate lysine in early finishing. Overall, gilts fed diets below requirements in early finishing, and subsequently at the estimated lysine requirement in late finishing had lower ($P < 0.03$) feed cost per kg of gain ($0.319 vs. 0.325 ± 0.002) and similar ($P > 0.70$) IOMFC ($83.46 vs. 82.97 ± 1.33), as compared to gilts fed at the estimated lysine requirement in both early and late finishing. These results suggest that as long as lysine requirements are met in late finishing for gilts, feeding slightly below the lysine requirement in early finishing decreases input cost without sacrificing overall IOMFC.

Key Words: Lysine, Finishing, Economics

185 Free and peptide-bound amino acids in small intestinal mucosa of growing pigs fed low-protein diets supplemented with amino acids. F. Guay* and N. L. Trottier, *Michigan State University, East Lansing*.

The objective of this study was to determine if reduced-protein amino acid (AA) supplemented diets alter peptide-bound (PB) and free (F) AA profiles in small intestinal mucosa of growing pigs. Twenty-four Yorkshire-Landrace growing pigs (37.0 ± 1.5 kg) were assigned to one of 4 diets in a randomized block design: 15% CP (15CP), 12CP+synthetic amino acid (SAA), 9CP+SAA and 6CP+SAA. Levels of SAA added were calculated to meet true digestible AA requirements for the growing pig. Diets were offered twice daily for 24 d. At slaughter, mucosal samples from duodenum, jejunum and ileum were collected two h post-meal. In the duodenum, free alanine was the only dispensable (D) AA to increase with reduction in dietary CP ($P < 0.05$). Reducing CP increased free lysine, methionine and threonine concentration ($P < 0.05$) but had no effect on other free indispensable (I) AA concentration. For PBAA, only lysine increased with decreased dietary CP, especially for 12 and 9CP+SAA diets ($P < 0.05$). In the jejunum, reducing CP had no effect on free DAA and IAA, except for cystine and glycine ($P < 0.05$). Lowering CP led to lower peptide-bound histidine, isoleucine, leucine, phenylalanine and valine concentration ($P < 0.05$). In the ileum, free asparagine, serine and tyrosine decreased with lowering CP ($P < 0.05$). For free IAA, reducing dietary CP decreased arginine, histidine, leucine, phenylalanine, isoleucine, tryptophan and valine concentration ($P < 0.05$). For PBAA, glycine, serine, isoleucine, leucine, lysine, phenylalanine and valine tended to decrease with decreased dietary CP ($P < 0.10$). These results show that decreasing dietary CP affected FAA and PBAA profiles in small intestinal mucosa of growing pigs. Results indicate that specific adaptation may be involved to maintain mucosal function.

Key Words: Amino Acids, Small Intestinal Mucosa, Growing Pigs

186 Influence of crystalline or protein-bound lysine on lysine utilization for growth in pigs. J. J. Colina*, P. S. Miller, A. J. Lewis, and R. L. Fischer, *University of Nebraska, Lincoln*.

Two 4-wk experiments were conducted to determine lysine utilization for growth in barrows and gilts fed individually or in groups. One hundred twelve growing pigs (56 barrows and 56 gilts; average initial BW of 18.6 kg) were used in each experiment. Pigs were fed individually or in groups of three. There were 28 pigs individually penned and 84 pigs in 28 pens (three pigs/pen). There were two replications per treatment in each experiment for a total of four replications. Dietary treatments consisted of a basal diet (0.55% lysine) and diets containing 0.65, 0.75, and 0.85% lysine that were achieved by adding lysine to the basal diet from either soybean meal (SBM) or L-lysine·HCl (crystalline). Average daily gain and ADFI were recorded. At the end of the experiments, all pigs were scanned using real-time ultrasound to determine tenth-rib backfat depth and longissimus muscle area (LMA) to calculate fat-free lean gain. Average daily gain was affected by dietary lysine concentration ($P < 0.01$), but was similar for both sources of lysine (SBM vs crystalline, respectively) at the same concentration (0.65% lysine: 524.5 vs 516.2; 0.75% lysine: 603.2 vs 616.3; 0.85% lysine: 635.2 vs 623.7 g/d). Pigs fed individually had a greater ($P < 0.05$) ADG than pigs fed in groups (586.7 vs 556.6 g). No differences among dietary treatments were observed for ADFI. However, pigs fed individually had a greater ADFI ($P < 0.05$) than pigs fed in groups (1,362 vs 1,290 g). Feed efficiency improved as the lysine concentration increased ($P < 0.01$). Backfat depth was similar among treatments. Pigs fed crystalline diets had a greater ($P < 0.05$) LMA than pigs fed SBM (15.7 vs 14.7 cm^2) at 0.85% total lysine. Gilts had a greater LMA ($P < 0.01$) than barrows (14.3 vs