

652 Defining lysine requirements for pigs based on otein deposition rate: 75 to 120 kg bodyweight. M. L. rschy, J. F. Patience*, D. A. Gillis, and S. Neis, *Prairie Swine Centre ., Saskatoon, Canada.*

rapidly evolving pork industry is seeking greater sophistication—and effectiveness—in diet formulation. A factorial approach based on otein deposition rate (PD) will aid in applying estimated requirements ross diverse genetic and environmental circumstances. Our objective us to define the apparent ileal digestible lysine (dLYS) requirement : PD in barrows (B) and gilts (G) grown from 75 to 120 ± 2 kg dyweight (BW). Four pigs per gender per treatment were individu- y housed. They were given ad libitum access to water and one of ten ets containing 13.6 MJ DE/kg and differing in dLYS: .25, .30, .35, .40, .50, .55, .60, .65 and .70%. B and G were fed diets 1 to 9, and 2 10, respectively. Other essential amino acids and non-essential amino id nitrogen were calculated to be non-limiting. Four pigs per gender he beginning of the test period and one pig per gender per treatment he end were slaughtered to estimate PD. Increasing dLYS lowered DFI (P<.001) and improved ADG (P<.001), PD (P<.001) and gain eed ratio (G/F; P<.05). ADFI and G/F were superior (P<.06) in urrows; ADG and PD were similar (P>.8) between genders. ADG in B d G at the breakpoint was 1026 and 1022 g/d, respectively, while PD as 123 and 132 g/d, respectively. Calculated using the first slope of e two-slope linear model, the maintenance dLYS requirement was 204 d 75 mg/kg^{.75} BW, for B and G, respectively, the marginal efficiency utilisation of lysine for PD was 76 and 78%, for B and G, respectively, d the requirement for dLYS per unit PD was 90.0 and 91.6 mg/g for and G, respectively. These data, in concert with other information e literature, allow for increasing the use of factorial estimates of amino acid requirements under commercial conditions.

Response criteria	dLYS/DE, g/MJ DE		dLYS intake, g/d		dLYS content, %	
Gender	B	G	B	G	B	G
ADG, g/d	.282	.355	13.77	13.82	.38	.48
G/F, g/g	.282	.346	12.97	14.50	.38	.47
D ₀ , g/d	.294	.358	14.01	14.20	.40	.48

Key Words: Pig, Lysine, Protein deposition

653 Effect of lysine supplementation on N metabolism of finishing barrows fed diets containing cane molasses. L. Loeza*, D. H. Beermann, K. Roneker, X. G. Lei, and R. W. Blake, *Cornell University, Ithaca, NY.*

Feeding diets containing 10 or 20% cane molasses (CM) reduces apparent N digestibility and efficiency of N retention in growing and finishing pigs. The objective of this study was to evaluate the effects on N metabolism of fortifying diets containing 20% CM with synthetic lysine at two levels of protein intake. Ground corn diets supplemented with soybean meal were formulated to contain 0 or 20% CM and 10 or 14% crude protein (CP) with a fixed lysine concentration of 6.3 ± .04% of the CP. Two groups of six crossbred barrows weighing 49.3 ± 1.4 kg were used in replicate N balance trials. Pigs were housed in metabolic crates in a temperature-controlled environment and were randomly assigned to receive either 0 or 20% CM diets containing 10 or 14% CP. Each diet was fed three times per day for a 14-d treatment period. Daily ad libitum intake was recorded for the initial 7-d adaptation period and feed intake for the following 7-d collection period was restricted to 95% of ad libitum intake. Blood samples were obtained on the last day of each collection period. Feed intake was not affected by level of CM (2.72 and 2.91 kg/d for 0 and 20% CM, respectively, at 10% crude protein; 2.56 and 2.87 kg/d for 0 and 20% CM, respectively, at 14% CP). Daily fecal N excretion was 14% greater (P < .01) when CM was fed, independent of CP level. Apparent N digestibility was not affected by CM (P < .10), but was higher at 14% CP (84.4 vs. 79.7) with no interaction. Urinary N excretion was not affected by CM, and was higher at 14% CP (117.9 vs. 114 g/d). Addition of CM had no effect on the rates of N absorption and retention, but both were 36% higher with the 14% CP diets (no interaction). Plasma urea N concentrations were similarly affected. Neither CM or percentage of CP had any effect on efficiency or biological value for N retained. Results suggest that fortification of diets containing 20% CM with lysine to recommended levels based on the ideal protein concept prevents negative effects on N metabolism.

Key Words: Cane Molasses, Swine, Lysine

654 Body composition and tissue accretion rates of barrows fed corn-soybean meal or crystalline amino acid supplemented diets at two feeding levels. S. Gomez, P. S. Miller, A. J. Lewis*, and H.-Y. Chen, *University of Nebraska, Lincoln.*

An experiment was conducted using 39 barrows with high lean gain potential (initial and final BW = 32.7 and 57.1 kg, respectively) to evaluate the body chemical composition and the tissue accretion rates of pigs fed a corn-soybean meal diet (CONTROL) and diets supplemented with crystalline Lys, Thr, Trp, and Met either on an ideal protein basis (IDEAL) or to a pattern similar to the CONTROL diet (AACON). Patterns were based on true ileal digestibility values. Diets were offered on an ad libitum basis or by feeding 80% of the ad libitum intake (a 3 × 2 factorial arrangement of treatments). There were six pigs per treatment (penned individually), and pigs were fed three times daily for 27 d. The protein concentration was approximately 4% lower in the IDEAL and AACON diets than in the CONTROL diet (11.7 and 12.3 vs 15.9%, respectively). Three pigs were killed at the start of the experiment and three from each treatment were killed at the end to determine body chemical composition. On a whole body basis, protein content (173 vs 167 vs 167 g/kg) and protein accretion rate (145 vs 125 vs 126 g/d) tended to be greater (P < .10) for pigs fed the CONTROL diet than for pigs fed the IDEAL or the AACON diets. Protein accretion rate (144 vs 118 g/d, P < .01), moisture accretion rate (520 vs 416 g/d, P < .01), and ash accretion rate (30 vs 21 g/d, P < .05) were greater for pigs that had ad libitum access to their diet than for pigs consuming 80% of ad libitum intake. In summary, pigs fed the IDEAL and the AACON diets tended to have less protein in the body and a lower protein accretion rate than pigs fed the CONTROL diet. The data suggest that a deficiency of a nutrient other than Lys, Thr, Trp, and Met was limiting in the IDEAL and AACON diets or that the bioavailability of crystalline amino acids was < 100%.

Key Words: Barrows, Amino Acids, Body Composition

655 Effects of increasing total sulfur amino acid:lysine ratio on growth performance of 10 to 25 kilogram pigs. M. De La Llata*, M. D. Tokach, R. D. Goodband, J. L. Nelssen, and S. S. Dritz, *Kansas State University, Manhattan.*

A 25 d growth study was conducted to determine the appropriate total sulfur amino acid:lysine ratio for 10 to 25 kg pigs. Three hundred and fifty pigs were blocked by weight (initially 10.2 kg) and allotted to one of 10 treatments arranged in a 2 × 5 factorial with two levels of dietary lysine (0.95% and 1.25 total) and five total sulfur amino acid levels (.45, .50, .55, .60 and .65% of total lysine). The diets were sorghum-soybean meal based and contained within the same lysine level equal amounts of all the ingredients except DL-methionine. Crystalline amino acids were added to maintain identical ratios of all amino acids relative to lysine except for methionine. Increasing total lysine from .95 to 1.25% increased (P < .01) ADG and feed efficiency (G:F). Increasing the total sulfur amino acid:lysine ratio increased G:F (quadratic, P < .10) from d 0 to 10. For the overall trial, ADG was not affected (P > .24) and G:F was increased (quadratic, P < .03) by increasing total sulfur amino acid:lysine ratio. Under these experimental conditions, the total sulfur amino acid:lysine ratio for the 10 to 25 kg pig is not greater than 55%.

Item	TSAA, % of lysine					SEM
	45	50	55	60	65	
ADG, g	530	555	542	552	553	8.9
G:F	.541	.568	.583	.572	.575	.01

Key Words: Methionine, Lysine, Pigs