

830 Ileal digestibility of protein and amino acids in low protein, amino acid fortified diets for growing pigs. M. Cervantes*, Universidad Autonoma de Baja California, Mexicali, G.L. Cromwell, University of Kentucky, Lexington, and D.A. Knabe, Texas A&M University, College Station.

An ileal digestibility trial with growing pigs (Hampshire-Yorkshire) was conducted to evaluate the effects of amino acid supplementation of low protein, grain sorghum-soybean meal diets on the apparent digestibility of dietary protein and amino acids. The sorghum was a low tannin, yellow endosperm cultivar that analyzed 8.9% CP, .21% lysine (lys), .33% threonine (thr), .38% methionine + cystine (met+cys), .35% isoleucine (ile), .11% tryptophan (trp), .46% valine (val), and .22% histidine (his). Five pigs (25 kg initial BW) were fitted with a T-cannula approximately 10 cm from the ileo-caecal junction. The pigs were fed four times daily at 0730, 1030, 1630, and 2130, during three 10-d feeding periods. Pigs were allowed 7 d of adaptation to the diets before collections were made. Intestinal contents were collected after the second meal, from d 7 to d 10, into bags containing 10% trichloroacetic acid. Dietary treatments were: (1) basal (91% grain sorghum, 5% soybean meal, vitamins, minerals; 10.5% CP), (2) basal + .45% lys + .15% thr + .08% met + .08% valine (val), and (3) grain sorghum-soybean meal positive control (16.5% CP). Each treatment was replicated five times. The apparent digestibilities (%) of protein and amino acids were: CP, 62.9, 67.5, 78.3; arginine (arg), 73.6, 77.0, 87.5; his, 58.8, 70.0, 77.3; ile, 68.9, 74.8, 82.1; leucine (leu), 72.8, 74.9, 80.5; lys, 50.9, 83.0, 83.8; met, 73.3, 83.0, 82.8; phenylalanine (phe), 70.4, 73.8, 80.7; thr, 58.7, 72.9, 76.2; and val, 70.0, 72.4, 81.0, respectively. The higher dietary protein level resulted in greater digestibilities of CP (P<.05) as well as arg, his, ile, lys, met, thr (P<.01), and valine (P<.10), when compared with the basal diet. Supplementing the basal diet with amino acids increased his (P<.10), thr (P<.05), lys (P<.01), and met (P<.01) digestibilities. These results indicate that both dietary protein level and amino acid supplementation influence the availability of dietary amino acids to growing pigs.

Key Words: Pig, Grain Sorghum, Digestibility

832 Lean growth response of pigs fed diets balanced on a lysine to digestible energy basis from 80 to 110 kg. B. V. Lawrence*, O. Adeola, and T. R. Cline, Purdue University, West Lafayette, IN.

Ninety six crossbred pigs, (barrows:gilts, 1:1), were fed diets formulated to contain 2.5, 3.0, 3.5, or 4.0 grams of lysine per Megacalorie (Mcal) of digestible energy (DE) at 3.25 or 3.5 Mcal DE · kg⁻¹ of diet in a 2 X 4 X 2 factorial experiment. Pigs, weighing 50.9 kg, were individually housed and allowed feed and water ad libitum. Body composition at 80 and 110 kg was determined from real-time ultrasound and bioelectrical impedance data. Direct carcass measurements were taken 24 h after slaughter at 112.9 kg. Weight gain increased as the DE level increased (P<.05) with barrows gaining faster than gilts (P<.001). The lysine:DE ratio also influenced the rate of weight gain (P<.05) with the optimum ratio dependent upon gender and DE concentration. Barrows fed 3.0 g/Mcal DE at the 3.5 Mcal DE level had the highest rate of weight, lean, and protein deposition. The increased rate of fat deposition (P<.05) associated with the 3.5 Mcal DE diets resulted in a reduced lean:fat ratio (P<.05) with the difference being gender dependent (P<.01). Daily feed intakes were similar across dietary treatments. Lean content at 80 and 110 kg was unaffected by dietary treatment. Differences did exist for total fat, tenth and last nb fat as measured by real-time ultrasound and direct carcass measurement with barrows being fatter than gilts (P<.05) and fat depth increasing as DE concentration increased (P<.05). Carcass measurement indicated gilts had a 4.3 cm² larger loin eye (P<.05) than barrows. Although carcass total fat content differed between gender and DE level, lean percent measured by total body electrical conductivity was similar across gender and dietary treatments. These results indicate the optimum lysine:DE ratio for rate of weight and lean gain lies between 3.0 and 3.5 g/Mcal DE for pigs fed 3.5 Mcal DE diets while pigs fed diets containing 3.25 Mcal DE may have a lower lysine:DE ratio requirement.

g lysine/Mcal	3.25 Mcal				3.5 Mcal				SD
	2.5	3.0	3.5	4.0	2.5	3.0	3.5	4.0	
Gain, g/d									
Body ^{ab}	872	798	864	806	905	887	902	835	95.5
Lean	282	256	255	262	271	274	280	266	43.4
Protein	114	108	111	108	114	115	118	110	16.3
Fat ^a	358	244	349	343	382	391	367	390	49.3
Intake, kg/d	3.39	3.02	3.29	3.05	3.21	3.11	3.15	2.98	.46
G/F ^a	.26	.27	.27	.27	.29	.29	.29	.28	.04

^aEnergy (P<.05) ^bLysine:DE (P<.05)

Key Words: Pigs, Lysine, Energy

831 The effect of dietary methionine on growth performance and carcass characteristics in high-lean growth gilts fed from 45 to 110 kg. K.G. Friesen, J.L. Nelissen, R.D. Goodband, M.D. Tokach, K.O. Owen, and B.T. Richert, Kansas State University, Manhattan.

One hundred-eight high-lean growth gilts (45 kg BW) were used to determine the dietary methionine requirement to optimize growth performance and carcass characteristics from 45 to 110 kg. The experiment was designed as a randomized complete block (three pigs/pen, six pens/treatment) with total methionine ranging from .25 to .425% (.21 to .36% digestible methionine). Dietary methionine was increased by replacing corn starch with DL-methionine. The period I diet (45 to 75 kg) was formulated to contain 1.17% total lysine (.94% digestible), .52% cystine, and 34 mg/kg choline, while the period II diet contained 1.01% total lysine (.83% digestible), .49% cystine, and 34 mg/kg choline. The diets were formulated on an ideal amino acid ratio to assure that methionine was the first limiting amino acid. When the pen mean weight for pigs in a pen reached 75 and 110 kg, one pig/pen was randomly chosen for slaughter to determine carcass characteristics. Average daily gain and ADFI were not influenced (P > .10) by dietary methionine during phase I, phase II, or for the entire experiment (45 to 110 kg). Feed intakes averaged 2.18, 2.98, and 2.56 kg/d for period I, period II, and the overall experiment, respectively. Thus, G/F was not influenced by dietary methionine (P > .10) for the entire experiment. Average backfat thickness (Ave. BF) and longissimus muscle area were not influenced (P > .10) at either 75 or 110 kg. The data from this experiment suggest that the dietary methionine requirement for high-lean growth gilts

Item	Total dietary methionine, % ^a						CV
	.250	.285	.320	.355	.390	.425	
45 to 75 kg							
ADG, kg	.89	.86	.89	.86	.87	.87	10.4
G/F	.40	.44	.40	.42	.38	.40	11.3
Ave. BF, cm	1.7	1.4	1.9	1.8	1.9	1.9	17.4
LMA, cm ²	30.1	30.5	31.4	31.7	31.1	33.0	13.5
75 to 110 kg							
ADG, kg	.85	.88	.93	.82	.84	.85	9.1
G/F	.29	.31	.31	.28	.27	.30	12.8
45 to 110 kg							
ADG, kg	.87	.87	.90	.86	.86	.87	8.1
G/F	.34	.38	.34	.34	.33	.35	12.8
Ave. BF, cm	2.6	2.5	2.6	2.4	2.4	2.7	11.0
LMA, cm ²	36.5	36.9	38.3	40.9	37.7	37.9	9.7

^aNo differences (P > .10).

KEY WORDS: Pigs, Methionine, Growth