

192 Effects of porcine somatotropin on the protein requirement of pigs from 22 to 60 kg. W. A. Dozier III¹, G. L. Cromwell, and M. D. Lindemann, *University of Kentucky, Lexington.*

The effects of PST on the dietary requirement for a near-ideal blend of amino acids (AA) of growing pigs were assessed. Forty pigs (22.5 kg BW) were individually penned and assigned to a 4 × 2 factorial (4 diets ± PST). A fortified corn-soy basal diet (1.50% lys) that included .33% lys, .22% thr, .30% met, and .03% trp was used. In three additional diets, lys was reduced to 1.25, 1.00, and .75% by diluting the basal with starch, cellulose, and sand (85:7.5:7.5)(ME = 3,435 kcal/kg). The ratios to lys (true ileal digestible basis) for thr, S-AA, trp, ile, and val were 67, 62, 19, 60 and 72% in all diets. PST was given at 2 mg/d (im). At 60 kg BW, carcasses were ground and analyzed for protein, fat, water, and ash. Six additional pigs were processed for initial composition. PST improved (P<.01) ADG (870 vs 830 g/d), feed/gain (2.40 vs 2.66), 10th rib backfat (12.0 vs 17.6 mm) loin eye area (27.8 vs 25.9 cm²), estimated carcass lean (65.4 vs 60.9%), and lean gain (423 vs 364 g/d). Increasing dietary lys improved (P<.01) backfat, carcass lean, and lean gain, but the responses were greater in PST-treated pigs (15.2, 13.9, 10.7, 8.4 mm; 61.2, 63.5, 67.5, 69.5%; 336, 427, 463, 468 g/d) than in controls (18.8, 16.0, 19.3, 16.3 mm; 59.7, 61.7, 59.9, 62.3%; 350, 381, 354, 372 g/d)(PST × lys, P<.02). PST affected (P<.01) accretion rates of carcass protein (109 vs 89 g/d), fat (134 vs 180 g/d), water (363 vs 311 g/d) and ash (18.4 vs 16.7 g/d). Increasing dietary lys increased % protein in the carcass and protein accretion rate (P<.01), but the responses were greater in the PST-treated pigs (16.2, 16.9, 18.1, 18.0%; 88, 112, 120, 117 g/d) than in the controls (15.5, 15.5, 15.3, 15.8%; 89, 92, 88, 89 g/d)(PST × lys, P<.01). These data along with previous results [JAS 74(Suppl.1):171] indicate that PST improves performance, leanness, and protein accretion rates in pigs from 22 to 60 kg and that the dietary requirement for a near-ideal blend of AA is increased by PST administration.

Key Words: Pig, Somatotropin, Amino Acids.

193 The effects of added carnitine and/or chromium nicotinate on growth and carcass characteristics. J. W. Smith, II, J. L. Nelssen, R. D. Goodband, M. D. Tokach, B. T. Richert, K. Q. Owen, J. R. Bergstrom, W. B. Nessmith, Jr, and S. A. Blum¹. *Kansas State University, Manhattan and ¹Lonza, Inc. Fair Lawn, NJ.*

Eighty crossbred gilts (PIC L326 × C-15; initially 37.6 kg BW) were used to examine the effects of carnitine and/or chromium nicotinate on growth performance and carcass characteristics of growing-finishing swine. Pigs were blocked by BW in ten randomized complete blocks in a 2 × 2 factorial arrangement with main effects including carnitine (0 or 50 ppm) and chromium nicotinate (0 or 200 ppb). Corn-soybean meal-based diets were fed in two phases: growing (38 to 66 kg) and finishing (66 to 109 kg). The growing diets were formulated to contain 1.0% lysine, .75% Ca, and .65% P, and finishing diets were formulated to contain .8% lysine, .65% Ca, and .55% P. All diets contained .1% L-lysine HCl. When mean pen weight reached 109 kg, pigs were slaughtered to collect standard carcass and quality measurements. Color also was analyzed by color spectrometry. Carnitine and/or chromium did not affect growth performance. No differences were observed for tenth rib backfat depth, last rib fat thickness, or average backfat thickness. In addition, longissimus muscle area, percentage lean and muscle were not affected by the addition of carnitine and/or chromium. An interaction between carnitine and chromium was observed for color and marbling (P < .10). Added chromium improved loin firmness, Hunter L* and a* values, and hue angle of the loin muscle (P < .05). Adding carnitine or chromium nicotinate did not affect color of the loin muscle; However, when added in together, the loin was darker and firmer. In conclusion, feeding carnitine and/or chromium did not influence growth, leanness, or muscling of the gilts used in this trial. However, adding both carnitine and chromium improved the color characteristics of the loin compared to adding either alone.

Item	Control	Carnitine	Chromium	Car+Cr	CV
10th Rib BF, cm	2.03	1.93	1.98	2.08	25.7
LMA, cm ²	44.26	45.61	44.90	44.00	10.6
Loin color (1-5)	2.39	2.29	2.22	2.66	20.6
Loin firmness (1-5)	2.44	2.26	2.35	2.62	21.6

Key Words: Pigs, Carnitine, Chromium Nicotinate, Carcass

194 Development of protein and lipid deposition curves for barrows and gilts of a commercial pig genotype. M. L. Lorsch¹, J. F. Patience¹, C.F.M. de Lange² and D. A. Gillis¹. *¹Prairie Swine Centre, Inc., Saskatoon, SK, Canada; ²University of Guelph, Guelph, ON, Canada.*

Whole body protein deposition rate (PD) is a major determinate of amino acid requirements in the growing pig and is closely related to lean growth. Knowledge of PD throughout growth is needed to optimize feeding programs for pigs under commercial conditions. Our objective was to characterize PD and lipid deposition rate (LD) for barrows and gilts of a defined genotype grown from 24 to 120 kg BW. Fifty-six pigs were fed *ad libitum* diets calculated to be non-limiting to PD, which contained digestible lysine and DE of 1.10% and 3.42 Mcal/kg, respectively (24- 65 kg) and .87% and 3.35 Mcal/kg, respectively (65-120 kg). Gross lysine utilization was calculated to be less than 55% indicating lysine was unlikely to limit PD. ADFI was similar (P=.135) for barrows and gilts grown from 24 and 120 kg, and averaged 92% of that predicted by NRC (1988). Carcass protein and lipid contents were determined in whole ground carcasses from pigs of each gender slaughtered (± 2 kg) at 24, 56, 72, 88, 104 and 120 kg. Protein and lipid content were related to time using a gompertz function. The R² for protein were 99.8 and 99.9%, and for lipid were 99.5 and 99.8%, for gilts and barrows, respectively. The RSD for protein were 2.4 and 1.8 kg, and for lipid were 18.6 and 11.5 kg for gilts and barrows, respectively. There was no difference (P=.416) in PD for gilts and barrows grown between 24 and 120 kg. Maximum PD was 142 g/d at 49 kg and 138 g/d at 64 kg, for barrows and gilts, respectively. Between 104 and 120 kg, PD for gilts was higher (P<.005)(109 g/d) than barrows (98 g/d). The greater decline in PD for barrows grown towards 120 kg was associated with a greater (P<.0001) LD. The Gompertz function was successfully used to describe protein and lipid content for barrows and gilts grown between 24 and 120 kg. The study also showed in the partitioning of energy for barrows and gilts grown between 24 and 120 kg.

Key Words: Protein deposition, Modelling, Gender

195 Effect of low levels of chlortetracycline (CTC) in grower and finisher rations on gain variability and performance in lean genotype, high health swine. G. Gourley¹* and T. Wolf². *¹Swine Graphics Enterprises, Webster City, IA, ²Hoffmann-La Roche, St. Charles, MO.*

The objective of this study was to evaluate the effect of CTC at 0, 55 or 110 mg/kg of complete feed administered continually in grower-finisher rations to high health, lean genotype swine on gain variation and pig performance. Single-sourced pigs (n = 576), averaging 28 kg each, were randomized by weight and sex to 24 pens (24 pigs/pen). Animals were separate sex fed corn-soy meal diets in a 5-phase feeding program, with gilts receiving lysine ranging from 1% to 0.64% and barrows from 1% to 0.55%. Dead and cull pig gain and feed were included in the statistical analysis. CTC at 110 mg/kg reduced (P < .1) the standard deviation of liveweight distribution at the end of the grower period. Increases in ADG in the grower were greatest with CTC at 110 mg/kg (P < .01) and in the finisher with CTC at 55 mg/kg (P < .1). Morbidity and mortality were decreased (P < .05) by both CTC treatments. Neither level of CTC impacted carcass characteristics nor meat quality. In summary, CTC fed at low levels in grower-finisher rations positively impacted performance and reduced gain variation in high health, lean genotype swine.

CTC (mg/kg)	0	55	110	CV
Grower (Day 0-55, 28-76 kg BW)				
ADG (kg)	0.83 ^{abc}	0.86 ^{abdf}	0.90 ^{bdg}	3.2
ADFI (kg)	2.10 ^{ac}	2.21 ^{abd}	2.25 ^{bd}	4.0
F/G (kg feed/kg gain)	2.53	2.56	2.51	2.2
Finisher (Day 55-110, 76-122 kg BW)				
ADG (kg)	0.81 ^e	0.86 ^f	0.84 ^{ef}	5.6
ADFI (kg)	2.72 ^e	2.83 ^{ef}	2.88 ^f	5.3
F/G (kg feed/kg gain)	3.35 ^{cd}	3.30 ^c	3.42 ^d	2.4

ab(P < .01); cd(P < .05); ef(P < .10).

Key Words: Swine, Chlortetracycline, CTC.