

Fat-O-Meter fat depth (16.4 vs 17.8 mm;  $P < .05$ ) and increased Fat-O-Meter loin depth (6.09 vs 5.57 cm;  $P < .05$ ) compared to the control trt. In addition, 20 ppm RAC had increased Fat-O-Meter loin depth (6.09 vs 5.77 cm;  $P < .05$ ) compared to the 5 ppm RAC. A difference in dressing percentage was also observed between all three genotypes (73.0, L3; 74.1, L2; 74.7%, L1;  $P < .05$ ). Pigs fed RAC had increased predicted % lean (55.7 vs 54.7 %;  $P < .05$ ) compared to the control trt. As the level of RAC was increased in the diet, growth performance and carcass traits were improved. However, 85% of the increase in ADG and 90% of the carcass improvements in all 3 genotypes was observed at the 5 ppm RAC level.

**Key Words:** Genetics, Finishing, Ractopamine

**191 Effect of ractopamine and lysine levels on growth and carcass responses in finishing gilts.** D.R. Cook\*, E.A. Newton, W.H. Turlington, K.R. Cera, and K.L. Adams, *Akey, Inc., Lewisburg, OH.*

The objective of this 6 wk trial was to determine the effects of dietary ractopamine (RAC) and lysine levels on growth performance and carcass characteristics of 80 PIC terminal cross gilts. At approximately 70 kg BW, gilts were penned individually (1.9 m<sup>2</sup>/gilt) and fed a corn-soy diet (0.81% lysine) containing tylosin (40 g/ton) for 7 d. Gilts were then randomly allotted, based on BW, to diets containing 10, 15, or 20 ppm RAC and 0.97, 1.12, or 1.27% dietary lysine (3×3 factorial). After 4 wk the lysine levels were adjusted to 0.85, 0.97, and 1.08%, respectively. Eight control (C) gilts remained on the 0.81% lysine diet for wk 1-4 and 0.74% lysine for wk 5-6. All gilts were given ad libitum access to feed and water. At termination of the trial, all gilts were slaughtered at Hatfield Quality Meats, Hatfield, PA. During wk 1-4, the main effect of RAC level indicated similar ADG (1266, 1238, 1270 g/d,  $P = .68$ ) and gain:feed ratios (474, 487, 494 g/kg,  $P = .22$ ) but lower ADFI (2685, 2540, 2572 g/d,  $P = .11$ ) as dietary RAC level increased. Main effects of lysine indicated higher ADG (1229, 1243, 1302 g/d,  $P = .13$ ) and improved gain:feed ratios (467, 486, 500 g/kg,  $P = .03$ ) but similar ADFI (2626, 2540, 2663 g/d  $P = .47$ ) as dietary lysine increased. No RAC × lysine interactions were observed ( $P > .15$ ). ADG, ADFI, and gain:feed ratios of C gilts in wk 1-4 were 1125 g/d, 2708 g/d, and 416 g/kg, respectively. During wk 5-6, no growth response to RAC was apparent. Increasing RAC level decreased 10<sup>th</sup> rib backfat (16.0, 14.5, 12.4 mm,  $P = .04$ ), and increased LEA (53.3, 55.1, 58.6 cm<sup>2</sup>;  $P = .11$ ). Control gilts had 22.6 mm 10<sup>th</sup> rib backfat and 47.7 cm<sup>2</sup> LEA. Increasing lysine resulted in a linear decrease in 10<sup>th</sup> rib backfat for 20 ppm RAC pigs, but not for 10 and 15 ppm RAC pigs (RAC × Lysine,  $P = .08$ ). Based on these data, muscle growth and fat deposition are responsive up to 20 ppm RAC, and growth performance is responsive to lysine levels as high as 1.27% in gilts fed RAC-supplemented diets.

**Key Words:** Ractopamine, Pigs, Growth

**192 Effects of feeding graded levels of ractopamine on pig performance in a commercial finishing facility.** R. G. Main\*, S. S. Dritz, M. D. Tokach, R. D. Goodband, and J.L. Nelssen, *Kansas State University, Manhattan.*

Our objective was to evaluate the impact of ractopamine HCl (Paylean<sup>®</sup>, Elanco Animal Health) supplementation during the final 21 days of the finishing period. Forty pens (880 pigs; initially 106.7 ± 0.5 kg) were used in a randomized complete block design in a 4 × 2 factorial arrangement. Main effects were added ractopamine (0, 5, 7.5, and 10 ppm) and gender (barrows and gilts). There were 20 to 23 pigs/pen and 5 pens/treatment. Diets were corn-soybean meal based and formulated to contain 0.7% and 0.9% total dietary lysine for the control and ractopamine supplemented diets, respectively. At slaughter, fat and loin depth were measured with an optical probe to calculate lean percentage. Fat and loin depth, and lean percentage were adjusted to a common carcass weight. Differences were observed ( $P < .01$ ) between pigs fed 0 ppm and 5, 7.5, or 10 ppm, respectively for daily gain (.77, .90, .91, .94 ± .03 kg/day) and feed efficiency (G:F; .28, .32, .34, .35 ± .01). However, no differences in gain were noted among pigs fed 5, 7.5, or 10 ppm of ractopamine. Pigs fed 10 ppm had greater G:F ( $P < .02$ ) compared with pigs fed 5 ppm, with pigs fed 7.5 ppm having intermediate G:F. No differences in ADFI were observed among treatments. Gender differences were not observed for ADG, ADFI, or G:F in this 21 day evaluation. Ractopamine supplementation did not affect lean percentage ( $P > 0.49$ ; 54.9, 55.2, 55.5, 55.6 ± 0.39%), backfat ( $P > 0.75$ ; 18.2, 18.0, 17.9, 17.5 ± 0.46 mm), loin depth

( $P > 0.67$ ; 60.5, 61.5, 62.4, 61.7 ± 1.1 mm), or yield ( $P > 0.12$ ; 75.7, 76.2, 76.3, 76.6 ± 0.23%). Gender differences in lean percentage (54.5 vs 56.2 ± 0.2% for barrow vs. gilt, respectively;  $P < .01$ ) and backfat (19.2 vs 16.5 ± 0.3 mm;  $P < .01$ ) were observed. Feeding 5 to 10 ppm ractopamine for 21 days prior to market improved growth rate and feed conversion in this study. Increasing ractopamine dosages from 5 to 10 ppm resulted in similar growth rate but improved feed efficiency.

**Key Words:** Ractopamine, Growth, Beta-agonist

**193 Response of barrows to phytase in lysine deficient diets.** M.C. Brumm\*, *University of Nebraska, Northeast Research & Extension Center, Concord.*

Crossbred barrows (n=780, 25.5 kg BW) were used to evaluate nutrient release formulation matrix values of phytase in corn-soy diets (13 pigs/pen and 12 reps/treatment). Phytase at 500 FTU/kg inclusion was assumed to release .01% lysine, .12% Ca and P and 10 kcal ME/kg. Diets were a positive control diet (UNL), diets formulated at 85% of the positive diet lysine level using corn and soybean meal (85), 85 diets formulated using phytase with nutrient release credits (PHY), PHY without phytase addition (NEG), and NEG with added Ca and P (MIN). Diets were switched on the week individual pens weighed 36, 59 and 86 kg. UNL diets were formulated to contain 1.00%, .88%, .73% and .60% lysine, and .34%, .30%, .25% and .21% available P for the respective weight ranges. ADG (kg/d) for the overall grow-finish period (110 kg final BW) was .80, .74, .73, .74, and .74 for the UNL, 85, PHY, NEG and MIN treatments, respectively. Corresponding daily lean gain containing 5% fat (kg/d) was .30, .27, .27, .27, and .27, respectively. Gain:feed for each treatment, respectively, was .340, .319, .306, .316, and .311. Comparing UNL to 85 resulted in improved ( $P < .005$ ) ADG, gain:feed and lean gain. There were no differences ( $P > .10$ ) in ADG or lean gain for 85, PHY, NEG and MIN. PHY had a lower gain:feed than 85 ( $P < .001$ ) and NEG ( $P < .01$ ) and was not different ( $P > .1$ ) from MIN. Metacarpal bone strength at slaughter (2 pigs/pen in replicates 5-8) was 199, 208, 204, 195 and 197 kg/cm<sup>2</sup> for UNL, 85, PHY, NEG and MIN, respectively. The claim for a .01% increase in lysine availability due to phytase addition was not supported as evidenced by the lack of improvement in performance for the MIN vs PHY treatments or the 85 vs PHY treatments. The lysine limitation in the PHY treatment appears to have been severe enough to prevent any response of phytase in improving Ca and P availability as evidenced by the PHY vs NEG and MIN vs NEG lack of differences in response and the bone breaking strength evaluation.

**Key Words:** Pigs, Phytase, Lysine

**194 Effects of a 28-day pre-slaughter withdrawal of supplemental dietary vitamins and minerals on vitamin content of pork, bone quality, and carcass bone fractures.** D. T. Shaw\*, D. W. Rozeboom, G. M. Hill, A. M. Booren, M. W. Orth, D. S. Rosenstein, and J. E. Link, *Michigan State University, East Lansing.*

The objectives of this study were to determine if supplement withdrawal (omission of dietary vitamin and trace mineral premixes and 2/3 reduction of inorganic P) 28-d pre-slaughter affects longissimus dorsi muscle (LDM) nutrient content, bone quality, and incidence of bone fractures at slaughter. The effects of adding 30% wheat middlings to corn-soybean meal based (CSBM) growing and finishing diets on LDM nutrient content and bone quality were also evaluated. Crossbred pigs (n = 32) were blocked by weight and randomly assigned to treatments using a 2 × 2 factorial design (with or without supplement withdrawal; CSBM or CSBM plus wheat middlings). Serum was collected during the withdrawal period to determine changes in concentrations of osteocalcin, an indicator of bone formation, and pyridinoline, an indicator of bone degradation. At slaughter, radiographs of lumbar vertebrae and femurs were taken to determine incidence of bone fractures, and LDM samples were collected. Third metacarpi were obtained to evaluate bone mineral density, ultimate shear strength, and percent ash. Supplement withdrawal did not affect Ca, P, Zn, Fe, Cu or thiamin content of the LDM; however, concentrations of riboflavin and niacin were decreased ( $P < .01$ ). Supplement withdrawal increased concentrations of serum osteocalcin and pyridinoline ( $P < .05$ ); the increases in bone turnover resulted in decreased bone mineral density, ultimate shear strength, and bone ash ( $P < .01$ ) of the metacarpi. Dietary wheat middlings increased LDM thiamin and niacin concentrations ( $P < .01$ ), but did not alter bone quality.