

Diets were prepared at one site and were formulated to contain equal levels of CP, LYS, MET+CYS, THR and TRP within each dietary phase. WS contained 47.49% green and yellow foxtail, 32.82% wheat, 8.72% straw and chaff, 7.84% wild oats, and 3.13% wild buckwheat seeds. Pigs at Site 1 were housed in a modified open front facility while pigs at Site 2 were in confinement. There were three replications of 7 pigs per pen at Site 1 and four replications of 8 pigs per pen at Site 2. ADG (g), ADFI (kg), and F:G values at Site 1 were: 931, 2.43, and 2.61; 905, 2.73, and 3.01; 864, 2.80, and 3.24; 836, 2.85, and 3.41; and 864, 3.15, and 3.64 for the C-S, 0% WS, 20% WS, 40% WS, and 60% WS diets, respectively. Performance values at Site 2 were: 900, 2.22, and 2.48; 850, 2.19, and 2.58; 836, 2.17, and 2.60; 855, 2.28, and 2.67; and 827, 2.35, and 2.84 for the C-S, 0% WS, 20% WS, 40% WS, and 60% WS diets, respectively. Substituting WS for C-S in diets containing 20% FP did not alter ADG ($P > .05$) but increased F:G ($P < .001$ at Site 1; $P < .01$ at Site 2). Most carcass measurements were not altered by the substitution of WS into the diets. However, yield and loin depth were reduced by WS at Site 1 and Minolta color scores of L. dorsi were darker at Site 2. DE (kcal/kg dm) values obtained with six pigs at Site 2 were: Corn, 3.701; WS, 3.410; FP, 3.585; and WCS, 3.987. Wheat screenings can represent an effective source of nutrients for growing-finishing pigs in diets containing field peas to provide a portion of the supplemental protein and amino acids. Ground canola seed can provide supplemental protein, amino acids, and energy to diets containing ingredients having DE energy values lower than corn.

Key Words: Growing-Finishing Swine, Wheat Screenings, Field Peas

155 The efficacy of feather meal in improving performance and carcass composition of growing-finishing swine. D. C. Brown^{*1}, J. K. Apple¹, C. V. Maxwell¹, K. G. Friesen², B. Z. deRoda¹, and Z. B. Johnson¹, ¹University of Arkansas, Fayetteville, AR, ²The Pork Group, Division of Tyson Foods, Rogers, AR.

Crossbred barrows and gilts ($n = 132$; BW = 25.43±6 kg) were used to test the effects of dietary incorporation of hydrolyzed feather meal (FM) on ADG, ADFI, and gain-to-feed ratio (G:F), as well as carcass composition, of growing-finishing swine. Pigs were blocked by weight, segregated within blocks into subgroups based on sex and litter, and assigned randomly to 24 pens (5-6 pigs/pen). Pigs were fed a 3-phase dietary program with transitions from starter to grower and grower to finisher when mean block weight reached 36 and 90 kg, respectively. A total of 24 pens were allotted randomly to 1 of 3 dietary treatments: 1) control corn-soybean meal (SBM) starter, grower, and finisher diets devoid of FM; 2) control diets supplemented with 3% FM; or 3) control diets supplemented with 6% FM. Within the FM-treated diets, FM was substituted for SBM on an equal lysine basis at the expense of corn. When the lightest block of pigs averaged 109 kg, all pigs were transported to a commercial pork processing plant and harvested according to industry-accepted procedures. After a 24-h chilling period, carcass fatness measures were recorded, and fabricated into primal cuts. Hams from the left sides were weighed, boxed, shipped to Louisiana State University, and analyzed in a TOBEC unit. Equations for ham and carcass composition included weight, fat measurements, and TOBEC data. During the starter phase, there was a quadratic decrease in ADG ($P \leq .06$) and G:F ($P \leq .05$). However, during the grower phase, there was a trend for G:F to increase linearly ($P = .12$) as FM increased in the diet. Inclusion of FM had no effects ($P \geq .10$) on performance during the finisher phase, or in the overall trial. Although carcasses from pigs fed 3% FM had greater average backfat measurements (quadratic; $P \leq .02$) than carcasses from pigs fed the control diets or diets containing 6% FM, dietary FM had no effect ($P \geq .10$) on ham or carcass composition. These data suggest that substitution of FM for SBM in the diets of growing-finishing swine may improve feed efficiency, especially during the grower phase, without dramatically affecting carcass composition.

Key Words: Growing-finishing Swine, Feather Meal, Carcass Composition

156 Effects of modified tall oil and creatine monohydrate on growth performance, carcass characteristics, and meat quality of growing-finishing barrows. P. R. O'Quinn^{*}, B. S. Andrews, R. D. Goodband, J. A. Unruh, J. L. Nelssen, J. C. Woodworth, and M. D. Tokach, Kansas State University, Manhattan.

Eighty crossbred barrows (initially 45.4 kg) were allotted randomly to one of four dietary treatments by weight and ancestry. The experiment was arranged as a 2 × 2 factorial with two levels of modified tall oil

(MTO; 0 or .50%), which were fed throughout the growing-finishing period, and two levels of creatine monohydrate (CMH; 0 or 25 g/d), which were fed for the final 10 d preslaughter. The corn-soybean meal diets were fed in two phases (45.4 to 78.9 kg and 78.9 to 117.5 kg BW). When CMH was added to the diet in place of corn, average BW was 107.5 kg. Feeding MTO increased ($P < .05$) ADG and gain to feed ratio (G:F) from 45.4 to 78.9 kg and tended to improve ($P = .10$) G:F from 45.4 to 107.5 kg. Dietary treatment did not affect ($P > .15$) growth performance from 78.9 to 107.5 kg. Modified tall oil increased ($P = .02$) G:F during the 10 d CMH supplementation period, and CMH numerically ($P = .11$) increased ADG and G:F. Supplementation of CMH did not affect ($P > .20$) any measured carcass characteristic or measures of meat quality at 24 h or 14 d postmortem. Feeding MTO reduced average backfat (2.70 compared to 2.93 cm, $P = .05$) and 10th rib backfat (2.10 compared to 2.45 cm, $P = .01$) but did not affect ($P > .10$) other measured carcass characteristics or measures of meat quality at 24 h postmortem. Modified tall oil increased ($P = .02$) L* values and tended to increase ($P \leq .10$) thawing and cooking losses of longissimus muscle chops at 14 d postmortem. These data demonstrate that MTO improves growth performance and reduces backfat in growing-finishing pigs, but supplementation of CMH, under the conditions of this experiment, was not beneficial for growing-finishing pigs.

Key Words: Pigs, Modified Tall Oil, Creatine Monohydrate

157 Effects of feeding modified tall oil and supplemental magnesium on growth performance, carcass characteristics, and meat quality of growing-finishing gilts. P. R. O'Quinn^{*}, J. L. Nelssen, J. A. Unruh, R. D. Goodband, J. C. Woodworth, and M. D. Tokach, Kansas State University, Manhattan.

Eighty crossbred gilts (initially 45.8 kg) were allotted randomly to one of four dietary treatments by weight and ancestry. The trial was arranged as a 2 × 2 factorial with two levels of modified tall oil (MTO; 0 or .50%) and two levels of added Mg from potassium magnesium sulfate (K₂SO₄-2MgSO₄; 0 or 2%). This level of supplemental Mg equated to a daily Mg intake of 7.75 g. The corn-soybean meal diets with and without MTO were fed in two phases (45.8 to 76.2 kg and 76.2 to 118.1 kg BW), and supplemental Mg was added to the diet in place of corn for the final 7 d preslaughter (starting at 114.1 kg BW). Dietary treatment did not affect ($P > .10$) ADG, ADFI, or gain to feed ratio (G:F). Feeding MTO decreased ($P = .05$) average backfat thickness (2.44 compared to 2.62 cm) and increased ($P = .04$) intramuscular marbling. Modified tall oil increased ($P = .02$) calculated percentage lean, (55.19 compared to 53.47%), and Mg supplementation lowered ($P = .04$) longissimus glycogen content. Dietary treatment did not affect ($P > .10$) other carcass characteristics or measures of meat quality such as drip loss, color, or lactic acid content of the longissimus muscle. Feeding MTO tended to increase plasma glucose ($P = .05$) and decrease ($P = .10$) base excess in the extracellular fluid. Feeding Mg tended to decrease ($P < .10$) plasma pH, blood urea nitrogen (BUN), and base excess in the whole blood and extracellular fluid and to increase ($P < .10$) K⁺, ionized Mg⁺⁺, and lactate. These results support earlier research identifying MTO as a potential carcass modifier and contributor to meat composition and quality. Magnesium supplementation altered whole blood profiles and longissimus glycogen content in a manner that should elicit improvements in pork quality, although they were not observed.

Key Words: Pigs, Modified Tall Oil, Magnesium

158 The introduction of conjugated linoleic acid enriched beef tallow into the diet of laying hens. R. Aydin^{*1}, M.W. Pariza², and M.E. Cook^{1,2}, ¹Animal Sciences Department, ²Department of Food Microbiology and Toxicology, University of Wisconsin, Madison.

Conjugated linoleic acid (CLA) is a mixture of positional and geometrical isomers of linoleic acid which has been shown to have many health attributes in humans and animals. However, studies conducted in our laboratory have shown that maternal dietary CLA increased the level of saturated fatty acids in egg yolk, altered interior egg quality, and induced embryonic mortality in various avian species. Since CLA may soon be used as an animal feed supplement, the objective of this study was to determine if feeding laying hens beef tallow from cows fed a CLA-supplemented diet would induce chick embryonic mortality and cause changes in egg quality. Single Comb White Leghorn laying hens (10 per treatment) were fed a diet supplemented with 0.5% canola oil (CO), 0.5% CLA (CLA), 10% regular beef tallow (BT), 0.5% CLA plus 10% regular beef tallow (CLA+BT), 10% beef tallow from cows fed 1%