

replacing normal corn on a lb-for-lb basis. In the grower phase, pigs fed HOC tended to gain faster ($P < .07$) and were more efficient ($P < .04$) than pigs fed the C diet. There were no differences in performance in the finisher 1, finisher 2, or overall periods, nor were there differences in BF. However, there was a tendency ($P < .075$) for pigs fed HOC diets to have smaller LMA. The mean dust concentrations in the HOC room was 40% less than the levels in the C room. In trial 2, the treatments were the same as in trial 1 plus a third treatment in which HOC replaced corn on a constant lysine:calorie ratio (L:C). The ratios for the 3 phases were 3.05, 2.60, and 2.27 g lysine/mcal ME, respectively. In the grower phase, L:C pigs gained faster ($P < .05$) than pigs consuming LB diets, and were more efficient ($P < .01$) than pigs fed the other 2 diets. No differences were observed in the finisher 1 or 2 phases. In the overall period, pigs fed L:C ate less feed ($P < .08$) than C pigs, and pigs fed wither of the HOC diets were more efficient ($P < .05$) than pigs were C diets. No differences were observed in BF, but feeding L:C diets tended to result in larger LMA when compared to LB diets ($P < .16$). Mean dust levels were reduced 37% in the HOC room. Thus, HOC results in a 40% reduction in dust levels, and needs to be incorporated into diets on a constant lysine:calorie basis.

Key Words: Pigs, High Oil Corn, Dust

823 Nutrient digestibilities of intact and insect damaged high oil corn and commercial corn fed to growing pigs. R. F. Gilliam*, C. S. Darroch, and K. R. Robbins, *University of Tennessee, Knoxville.*

The objective of the trial was to determine the nutritive values of damaged high oil corn (DHOC), undamaged high oil corn (UHO) and commercial corn (NC). Two groups of 12 crossbred barrows, average BW of 32.1 kg, were placed in metabolism crates in a RCBD to determine energy and protein digestibilities. In each 10-d feeding period (5 d adaptation, 5 d total collection), pigs were fed the test grain as the only source of protein and energy in the diet. Vitamins and minerals were supplied to meet NRC (1998) requirements. Insect damaged HOC had lower ($P < .0001$) 1000 kernel weights, 238.1 g (± 3.32 ; $n=5$) when compared to UHO (355.4 g) and NC (272.0 g). Compared to UHO, insect damaged HOC had fewer intact kernels (50.8% vs 77.0%, $P < .0001$), more insect damaged whole kernels (15.9% vs 5.0%, $P < .0001$), more fragmented kernels (32.3% vs 17.6%, $P < .0001$) and more chaff (0.9% vs 0.4%, $P = .0028$). NC had the greatest percentage of intact kernels (87.9%), and the lowest percentages of damaged whole kernels (1.5%) and fragmented kernels (10.2%). Despite differences in quality, UHO and DHOC had higher GE values (3866 kcal/kg and 4081 kcal/kg, respectively) than NC which averaged 3562 kcal/kg. UHO had the highest level of crude protein (9.1%), DHOC was intermediate (8.9%) and NC had the lowest crude protein level (7.6%). Final pig live BW, adjusted for initial BW were not different among treatments ($P = .8692$) but pigs in the second replication were heavier ($P = .0168$) than those in the first replication. The coefficient for apparent fecal protein digestibility was highest (85.2%) for UHO. DHOC had a lower ($P = .0464$) coefficient for protein digestibility (81.3%, ± 1.10). The apparent fecal protein digestibility of NC was intermediate to those of UHO and DHOC. Digestible energy differed among treatments ($P = .0001$) and averaged 3658.42 kcal DE/kg, 3788.72 kcal DE/kg and 3314.21 kcal DE/kg for UHO, DHOC and NC respectively. The results of this experiment suggest that insect damage to HOC lowers protein quality and availability, but has little impact on digestible energy levels. HOC even when damaged may be used as a replacement for commercial corn in diets for growing pigs.

Key Words: High oil corn, Nutrient digestibility, Growing pigs

824 Effect of creatine monohydrate on finishing pig growth performance, carcass characteristics, and meat quality. B. W. James*, R. D. Goodband, J. A. Unruh, M. D. Tokach, J. L. Nelssen, P. R. O'Quinn, and B. S. Andrews, *Kansas State University, Manhattan.*

Growth performance, carcass characteristics, and meat quality were evaluated from 320 pigs (PIC C22 \times L326) fed either a control diet (.75% lysine) or diets containing added creatine monohydrate (CMH). Pigs (initially 53.5 kg) were sorted by weight, gender, and ancestry in a randomized complete block design and allotted to one of four dietary treatments with eight replicates. Pigs were fed a sorghum-soybean meal

diet until 30-d preharvest (87.2 kg) when dietary treatments were initiated. Experimental treatments consisted of: 1) a control diet; 2) control diet with 3 g CMH/pig/d for 30-d (maintenance); 3) 25 g CMH/pig/d for 5-d followed by 3 g CMH/pig/d for the next 25-d (early load); 4) or 25 g CMH/pig/d 5-d before slaughter (late load). Average market weight was 112.4 kg. Feeding CMH did not affect ($P > .10$) ADG, ADFI, or gain:feed ratio (G:F) during the 30-d supplementation period. Average back fat, tenth rib fat depth, longissimus muscle area, and percentage lean were not affected ($P > .25$) by feeding CMH. Visual color and marbling scores were not affected ($P > .20$) at 24-h or 14-d postmortem; however, the mean firmness score of all pigs fed CMH was greater ($P < .05$) at 24-h and 14-d postmortem than pigs fed the control diet. Longissimus muscle percentage moisture, protein, and lipid and 14-d postmortem loin purge loss and Warner-Bratzler shear force values were not affected ($P > .21$) by treatment. Longissimus muscle drip loss percentage at 24-h postmortem was less ($P < .05$) for pigs fed maintenance and late load CMH compared to pigs fed early load CMH (4.06, 4.15, vs 5.76%). Maintenance CMH pigs also tended to have less ($P < .09$) drip loss than control pigs (4.06 vs 5.31%). At 14-d postmortem, the mean of pigs fed CMH had less ($P < .06$) drip loss compared to control pigs. These results suggest that added CMH does not affect finishing pig growth performance but may increase longissimus muscle firmness and decrease drip loss at 14-d postmortem.

Key Words: Pigs, Creatine, Meat Quality

825 Effects of feeding supra-nutritional levels of vitamin E on pork quality in two different genotypes. J. L. Hasty*, E. van Heugten, and M. T. See, *North Carolina State University, Raleigh.*

The objective of this study was to examine the effects of feeding supra-nutritional levels of vitamin E on pork quality of different genotypes. Pigs ($n=240$) with an average initial BW of 87 kg, were blocked by weight and randomly assigned to one of ten treatments (8 pens/trt, 3 pigs per pen) in a 2 \times 5 factorial arrangement. Factors included: 1) genotype, (Berkshire \times PIC as superior meat quality breed and Hampshire \times PIC as poor meat quality breed) and 2) supplemental levels of vitamin E (0, 75, 150, 300 and 600 mg/kg). Animals were fed standard corn and SBM based diets containing 2.5% fat, 0.83% lysine and 15 mg/kg vitamin E for 6 weeks. Biopsies of the longissimus dorsi (LD) were obtained at the initiation of the experiment, d 21, and d 42 of supplementation. Fluid loss and pH of the fluid from biopsy samples were used as indicators of pork quality and were not affected by vitamin E supplementation ($P > .10$). However, fluid loss was greater ($P < .07$) in Hampshire pigs (51.9 vs. 47.7%) and pH of the fluid was greater ($P < .10$) in these pigs compared to Berkshire pigs (6.40 vs. 6.35). Pigs were slaughtered at a commercial facility after the 6 week experimental period and loin samples were obtained 24 hr post-mortem. Drip loss was greater ($P < .001$) in Hampshire pigs compared to Berkshire pigs (92.9 vs. 66.3 mg fluid accumulated on filter paper). Muscle vitamin E concentration increased linearly ($P < .001$) from 2.02 to 5.92 mg/kg for pigs fed 0 to 600 mg/kg of vitamin E. Concentration of vitamin E in muscle was greater in Berkshire pigs compared to Hampshire pigs when 75 mg/kg of vitamin E was fed (4.72 vs. 3.76 mg/kg). In summary, pre-slaughter muscle biopsy fluid loss appeared to be an accurate indicator of post-slaughter drip loss. Results of the study further demonstrate that differences in fresh pork quality exist between genotypes (as measured by drip loss), but did not appear to be improved by vitamin E supplementation.

Key Words: Vitamin E, Genotype, Pork Quality

826 Effects of increasing L-lysine HCl on growth performance and carcass characteristics of gilts from 27 to 120 kg. M. De La Lata*, S.S. Dritz, M.D. Tokach, R.D. Goodband, and J.L. Nelssen, *Kansas State University, Manhattan.*

A total of 1,200 gilts (PIC C22 \times 337) with an initial weight of 29 kg were used in a 116-d growth trial to determine the effect of increasing L-lysine HCl in corn-soybean meal based diets on growth performance and carcass characteristics. Pigs were housed in a fully slatted commercial research facility and allotted to one of 8 dietary treatments in a randomized complete block design with 25 pigs/pen and 6 pens/treatment. The dietary treatments were fed in four phases and consisted of a positive control diet with no added L-lysine HCl and 6 increasing levels of L-lysine HCl (.05, .10, .15, .20, .25, and .30%) replacing the lysine