205 Effect of added fat, carnitine, and lysine to calorie ratio on grower pig performance. R. B. Hinson[1], L. M. Wilson*[1], S. A. Trapp[1], J. S. Radcliffe[1], K. Q. Owen[2], J. C. Woodworth[2], and B. T. Richert[1], [1]*Purdue University,* [2]*Lonza Inc.*

The effects of increased dietary energy, carnitine, and lysine:calorie (Lys:Cal) were evaluated using 427 terminally crossed pigs blocked by BW (avg. 23.6 kg) and randomly assigned to dietary treatments. Ten dietary treatments were used containing: 0, 3.5, or 7% added fat; 0 or 50 ppm supplemental L-carnitine; with or without maintaining the Lys:Cal in the 3.5 and 7.0% fat diets. Pigs were housed in 60 pens (6 pens/trt) in two barns. The trial consisted of two 21 d phases, with treatments maintained in all phases. Individual BW and pen feed intake were recorded on d 0, 21, and 42. Ultrasonic estimates (4 pigs/pen) of 10th (TRBF) and last rib backfats (LRBF) and loin eye area (LEA) were determined on d 0, 20, and 41. No main effects of carnitine on any growth response criteria were observed (P>.10). ADG during Phase 1 (d 0-21) was unaffected by increasing dietary fat, but ADFI decreased linearly (P<.001) and G:F improved linearly (P<.001). During Phase 2 (d 21-42) and overall (d 0-42) ADG (P<.05) and G:F (P<.001) were linearly increased, ADFI (P<.001) was linearly decreased as dietary fat increased. Both LRBF (P<.01) and TRBF (P<.05) increased linearly as fat increased in the diet. Increasing Lys:Cal improved Phase 1 ADG (780 vs. 804 g/d; P<0.03) and G:F (.563 vs .573; P<.05). An interaction (P<.04) was observed between carnitine and Lys:Cal on ADG, with ADG increasing when the Lys:Cal was increased in carnitine supplemented diets, but decreasing when Lys:Cal was increased in non-carnitine supplemented diets. A 3-way interaction (P<.02) between fat level, carnitine, and Lys:Cal on Phase 2 and overall ADG was observed. Increasing the Lys:Cal increased Phase 2 and overall ADG at all fat and carnitine levels, with the exception of 7% added fat and no added carnitine where an increase in Lys:Cal caused a decrease in ADG. Increasing dietary energy during the grower phase improved pig growth performance and maintaining the Lys:Cal further enhanced the growth response to increased fat.

Key Words: Pigs, Carnitine, Energy

206 Impact of high dietary oleic acid on growth performance and pork quality. E. O. Castaneda*[1,2], M. Ellis[1], F. K. McKeith[1], and D. Brana[1,3], [1]*University of Illinois,* [2]*CONACYT, Mexico,* [3]*INIFAP, Mexico.*

The objective of the study was to compare the effects of dietary inclusion of high oleic sunflower oil (HOSO) or soybean oil (SO) on growth and meat quality. The study was carried out for 35 days from 75 to 120 kg BW, using a completely randomized design with six dietary treatments: 1) Control (corn and soybean meal); 2) SO (5% of the diet); 3) HOSO (5%); 4) SO (10%); 5) HOSO (10%); and 6) 50:50 mixture of SO and HOSO (10%). A total of 144 pigs were housed in single-sex pens (barrows or gilts; 4 pigs/pen). At the end of the study two pigs per pen were randomly selected for slaughter. Treatment means were compared using preplanned contrasts. Compared to controls, pigs fed 5 or 10% added fat ate less (P < 0.05; 3.27, 2.97, and 2.91 kg/d; SEM= 0.075), had better gain:feed ratio (P < 0.05; 0.36, 0.39, and 0.43; SEM= 0.008) and greater (P < 0.05) 10th rib BF thickness (2.07, 2.43, and 2.60 cm; SEM= 0.106). Ultimate pH was higher (P < 0.05; 5.54 vs. 5.49; SEM= 0.015), whereas L#42# value (53.70 vs. 55.90, SEM= 0.768), drip loss (4.40 vs. 5.35 %, SEM= 0.419), and shear force (4.16 vs. 4.56 kg, SEM= 0.178), were lower (P < 0.05) for the SO treatments when compared with the control. Intramuscular fat content was increased (P < 0.05; 2.07, 2.73, and 2.67%; SEM= 0.201) with 5 or 10% of fat inclusion in the diet when compared to control. Pork flavor (15 point scale) in the longissimuss muscle was enhanced (P < 0.05; 7.88 vs. 7.34; SEM= 0.134) for the HOSO compared to the SO treatments. The percentage of oleic acid in backfat (51.8 vs. 34.7, SEM= 0.97) and in intramuscular fat (48.2 vs. 42.3, SEM= 1.23) was higher (P > 0.05) for HOSO compared to SO treatments, while SO increased (P < 0.05) the percentage of linoleic acid in the same tissues (25.2 vs. 10.7, SEM= 0.86; and 10.7 vs. 8.9, SEM= 0.79). In conclusion, fat sources with high oleic fatty acid content can be used in the finishing diet to increase pork flavor with no detrimental effect on growth performance, carcass characteristics, or meat quality.

Key Words: Pigs, Fat, Meat Quality

207 Effect of corn distiller's dried grains with solubles (DDGS) on growth, carcass characteristics and fecal volume in growing-finishing pigs. S. X. Fu*[1], M. Johnston[2], R. W. Fent[1], D. C. Kendall[1], J. L. Usry[3], R. D. Boyd[2], and G. L. Allee[1], [1]*University of Missouri,* [2]*The Hanor Company,* [3]*Ajinimoto Heartland LLC.*

Two trials were conducted to determine the effect of dietary corn distiller's dried grains with solubles (Dakota Gold®;DDGS) on growth, carcass characteristics and fecal excretion in growing-finishing pigs. In Trial 1, 256 barrows with an initial BW of 28.5 kg were fed experimental diets in a 5-phase feeding program. Dietary treatments involved 0, 10, 20 and 30% DDGS, with 8 replicate pens of 8 pigs per pen. Experimental diets were formulated to contain equivalent apparent ileal digestible lysine (1.06, 0.89, 0.77, 0.70 and 0.63% respectively). Diets were isocaloric (1 to 2% added fat) and formulated using 0.15% (Phase 1 to 4) or 0.10% (Phase 5) L-Lysine HCl so that digestible threonine, tryptophan and sulfur amino acids were held equal or above the control. The addition of DDGS resulted in a linear decrease in feed intake (2.56, 2.53, 2.44 and 2.41 kg/d; P<0.001), ADG (1.03, 1.01, 0.99 and 0.98 kg/d; P<0.001) and body weight (123.8, 121.7, 121.2 and 118.9 kg; P<0.01) after 92d on test. No difference was observed in G:F (0.405, 0.400, 0.407 and 0.405; P>0.45) for the 92-d test period. However, gain:feed was improved in a linear (P<0.01) manner for the first 42 d on test with increasing DDGS. Carcass weight was reduced linearly (P<0.002) as dietary DDGS level increased. No differences in backfat, loin depth, percentage carcass lean and yield were observed among treatments. In Trial 2, 12 pigs (97.4 kg) were placed in metabolism crates allowing for separate and total collection of urine and feces in an environmentally controlled room. Pigs were allotted to treatments of 0, 10 or 20% DDGS in two periods of a 7d adaptation and 3d collection of urine and feces. Fecal mass increased linearly (P<0.06) with increasing DDGS addition. Fecal volume increased 5.7% and 13.2% in pigs fed 10% and 20% DDGS diets, respectively. These results suggest that feeding DDGS for a fixed time period will reduce pig slaughter and carcass weight while increasing fecal volume.

Key Words: Distiller's Dried Grains with Solubles, Pigs, Fecal Volume

208 Energy value of dried distillers grains with solubles in swine diets. C. W. Hastad*, M. D. Tokach, J. L. Nelssen, R. D. Goodband, S. S. Dritz, J. M. DeRouchey, C. N. Groesbeck, K. R. Lawrence, N. A. Lenehan, and T. P. Keegan, *Kansas State University.*

Two experiments were conducted to determine the energy value of dried distillers grains with solubles (DDGS). In Exp.1, 360 pigs (initially 17.5 kg) were used in a 22 d growth assay. Treatments consisted of five corn-soybean meal-based diets with added wheat bran or soy oil to provide five ME levels ranging from 3,064 to 3,536 kcal/kg. Two sources of DDGS were used, one from a relatively new plant (MN), and a second from an older plant (NB). Pigs were fed four additional diets including either 15 or 30% DDGS from each source. For the 22 d growth trial, increasing energy increased (linear; P<0.01) ADG and feed efficiency (G/F) and reduced (linear; P<0.01) ADFI. The linear improvement in G/F allowed estimation of the kcal of ME/kg of DDGS for the MN (3,494) and NB (3,128) sources. In Exp. 2, eight barrows (initially 44.6 kg) were used in a metabolism study with treatments arranged in a Latin square design to determine the ME of the two DDGS sources used in Exp. 1. Diets were 97% DDGS with added amino acids, vitamins, and minerals to meet or exceed the pigs nutrient requirements. Estimated DE (3,871 vs. 3,728; P<0.02) and ME (3,697 vs. 3,587; P<0.05) were higher for the MN compared to the NB DDGS. These ME values were 6% higher for the MN DDGS and 15% higher for the NB DDGS than were calculated in our growth trial. Estimating net energy from chemical composition suggests that DDGS have a lower energy value relative to corn (96% and 90% for MN and NB, respectively). These studies suggest possible variation in the energy value of DDGS based on how it is measured. Measurement of ME through nutrient balance studies where pigs are individually fed a limited amount of feed appears to over estimate utilizable energy as compared to net energy calculations or the predicted value from growth trials.

Key Words: Distillers Dried Grains with Solubles, Pigs, Energy