r=0.331 respectively) , indicating that samples with less intact desmin may have lower WBS values. The pH at 24 h and intact SERCA-1 at 96 h and 7 d in the LD were significantly correlated (r=0.276 and r=0.306 respectively) and in the SM at 96 h and 7 d (r=0.326 and r=0.382 respectively) indicating that samples with low 24 h pH had less intact SERCA-1 at later aging times. These results indicate increased proteolysis of SERCA-1, RYR, and desmin may be associated with increased tenderness. These results also indicate that SERCA-1 degradation may be associated with differences in pH decline.

Key Words: Tenderness, Pork, Proteolysis

Nonruminant Nutrition: Feed ingredients

296 Influence of variation in particle size on the flow characteristics of ground corn. C. N. Groesbeck*, R. D. Goodband, M. D. Tokach, J. L. Nelssen, S. S. Dritz, C. W. Hastad, and K. R. Lawrence, *Kansas State University, Manhattan*.

In previous research, we showed that roller mill (RM) ground corn flows better than corn ground with a hammer mill (HM), and decreasing particle size and increasing fat decreases flow ability. Therefore the objective of these experiments was to determine if the flow differences between HM and RM ground corn were due to the particle size standard deviation (PSSD). In both Exp., RM and HM corn samples were sifted through 13 screens and material from each screen was collected. Samples were dried 12 h to equalize moisture content. Soy oil was then added at 0, 4, and 8 % to samples. Flow ability was then determined by measuring angle of repose (the maximum angle measured in degrees at which a pile of grain retains its slope). A large angle of repose represents a steeper slope and poorer flow ability. In Exp. 1, we created 5 RM samples with mean particle size ranging from 1415 to 343 microns and 5 HM samples from 1382 to 333 microns. All samples were created to have similar PSSD, ranging from 1.1 to 1.3. There was an interaction (P<0.05) between particle size, added fat, and mill type. Increasing fat increased angle of repose; however, the difference was less in fine ground HM samples than in the RM samples. In RM samples, decreasing particle size had less of an impact on flow ability than in HM ground corn. In Exp. 2, we used 4 RM and 4 HM samples that were constructed from the previously collected grain. All samples were similar in mean particle size (641 to 679 microns) with varying PSSD (1.62 to 2.27). There was no (P>0.10) fat x PPSD x mill type interaction observed. Increasing fat (P<0.04) and PSSD (P<0.001) decreased flow ability. These data suggest that the greater flow ability of RM ground corn appears to be a result of less particle size variation. However, with fine particle sizes (<700 microns) other factors, such as particle shape, may also contribute to flow ability.

Key Words: Particle size, Hammer mill, Roller mill

297 Effects of soybean meal source and level on growth performance of weanling pigs. K. R. Lawrence*, R. D. Goodband, M. D. Tokach, S. S. Dritz, J. L. Nelssen, J. M. DeRouchey, C. W. Hastad, B. W. James, and M. G. Young, *Kansas State University, Manhattan*.

Three experiments were conducted to compare the effects of increasing solvent extracted soybean meal (SBM) and extruded-expelled soybean meal (EESOY) in diets for early-weaned pigs. All pigs (PIC; 5 pigs/pen) were fed a control diet containing no SBM or diets containing 20% or 40% of either SBM or EESOY. In Exp. 1 (n=175, 6.0 kg BW; 7 pens/treatment), diets were formulated using NRC (1998) nutrient values for SBM and previously determined values for EESOY. From d 0 to 14, no differences were observed in ADG or ADFI (P>0.05), but G:F became poorer (linear, P<0.06) with increasing soybean meal source. Soybean meal sources were analyzed for CP after the trial was completed. We speculated numeric differences in performance between sources could have been a result of lower than expected CP in the EESOY. In Exp. 2 (n=350, 5.9 kg BW; 14 pens/treatment), soybean meal sources were analyzed and actual nutrient values were used in diet formulation. From d 0 to 14, increasing SBM decreased ADFI (linear, P<0.02). Increasing EESOY decreased ADG, ADFI, and G:F (linear, P<0.01). Soybean meal sources used in Exp. 1 and 2 were then analyzed for trypsin inhibitor (TI). The EESOY from Exp. 1 and 2 had TI values greater than 6 mg TI/g, suggesting it was underprocessed, while SBM had values less than 2 mg TI/g. In Exp. 3 (n=350, 7.1 kg BW; 14 pens/treatment), different lots of EESOY and SBM were analyzed for TI (EESOY=1.8 mg TI/g; SBM=0.7 mg TI/g) to ensure quality and actual CP values were used in diet formulation. From d 0 to 14, increasing EESOY decreased ADG and ADFI, but improved G:F (linear, P<0.01). Increasing SBM decreased ADFI, but improved G:F (linear, P<0.02). No differences (P>0.05) were found between soybean meal sources. Feeding 40% EESOY or SBM in diets immediately after weaning resulted in poorer growth performance of weanling pigs compared to those fed lower levels (20%). Feeding properly processed EESOY resulted in similar growth performance compared to feeding SBM.

Key Words: Pigs, Soybean meal, Performance

298 Effect of Poultry by-product meal on pig performance. J. R. Orozco-Hernandez*, J. J. Uribe, S. G. Bravo, V. O. Fuentes-Hernandez, A. Aguilar, and O. H. Navarro, *Centro Universitario de los Altos, Universidad de Guadalajara, Tepatitlan, Jalisco, Mexico*.

Searching and assessing proteinaceous ingredients to be used in single stomach animals is a constant task. On the other hand, there is a continuous renewal of poultry population which generates a protein source of amino acids that can be used in pig feeding. The objective of the trial was to assess increasing levels of a poultry by-product meal in practical pig feeding, from weaning to market weight. Forty newly weaned hybrid pigs were separated into 5 animal groups to assess the addition of 0, 2.5, 5 y 7.5% (dry matter basis) of a poultry by-product meal (HSA) to a sorghum-soybean meal diet in pigs. The intake was measured daily and the weight gain was calculated using initial and final measurements. The initial weight was used as co-variable for the gain. Most of the production parameters were negatively affected with the addition of HSA (P < 0.05). Carcass yield and fat content were reduced (P < 0.05), however the yield of mexican style cuts varied differently. In conclusion, increasing the addition of HSA affects negatively some of the production parameters and carcass yield in pigs.

Key Words: Poultry by-product, Pig, Feeding

299 Effect of inulin and sugar beet pulp on the growth performance and carcass characteristics of wean to finish pigs. G. F. He*, S. K. Baidoo, Q. Yang, and R. D. Walker, *Southern Research and Outreach Center, University of Minnesota, Waseca, MN 56093*.

The objective of the present study was to determine the performance and carcass characteristics of wean-to-finish pigs fed diets with different carbohydrate sources (inulin and sugar beet pulp). Six hundred and forty early weaned (17-d old, 5.7 ± 0.11kg body weight) barrows and gilts were housed in an environmentally controlled facility from wean to finish. The duration of the study was divided into five phases: 5.7-10; 10-20; 20-50; 50-90; 90-115kg BW. Pigs were blocked by initial body weight and allotted to four dietary treatments: (1) corn soybean meal basal diet as control; (2) basal diet supplemented with inulin in water, 132g/L in phase 1-2, 66g/L in phase 3-5; (3) Ground sugar beet pulp (5% and 7% in phase 1 and 2, 9% in phase 3-5) replacing partial corn in control diet; (4) basal diet supplemented with 0.25% antibiotics (ASP250, Roche Vitamins Inc., Basel, Switzerland) only in phase 1-3. Pigs in treatment 4 grew faster (P<0.01, 601, 613, 594 and 666 g/day for treatment 1-4, respectively, s.e. =8.10) and had higher feed intake (P<0.01, 1244, 1276, 1273, 1368 g/day for treatment 1-4, respectively, s.e.=18.30) than others in phase 1-3. Gain to Feed was negatively influenced (P<0.01) by sugar beet pulp supplementation in treatment 3 compared to treatments 1, 2 and 4 (0.48, 0.48, 0.46, 0.49 for treatment 1, 2, 3 and 4, respectively, s.e.=0.004) in phase 1-3. In phase 4, increased growth rate was observed in pigs supplemented with inulin in water (P<0.01, 1021, 1054, 1026, 1002 g/day for treatment 1-4, respectively, s.e.=9.79). In phase 5, there was no difference in growth performance among treatment groups. Post-slaughter carcass characteristics, including average fat depth, average loin depth, lean percentage and carcass grade premium, were not influenced by the treatments except dressing percentage, which was lower for treatment 3 group (P=0.02, 74.4%, 74.4%, 73.4% and 74.6% for treatment 1, 2, 3 and 4, respectively, s.e.=0.29). In conclusion, continuous supplementation of inulin