

on various hair measurements in growing finishing pigs and reproducing sows. The first experiment was a 2 × 6 factorial arrangement conducted as a RCB in two replicates with measurements collected over time. A total of 48 crossbred pigs of varying hair colors were fed treatment diets for a 14 wk period. Inorganic and organic Se sources were added at .3, 1, 3, 5, 7 and 10 ppm Se. Hair samples were collected from the dorsal-midline of white and red haired pigs at 4, 6, 10, 12, and 14 wk and analyzed for Se and amino acids. Hair Se concentration increased as dietary Se level increased ($P < .01$), over time ($P < .01$), and highest when pigs were fed organic Se ($P < .05$). Selenium concentration in red hair was higher than white hair ($P < .01$) even when both hair colors were present on the same pig. Amino acid compositions were similar for both hair colors, Se sources and Se levels. The second experiment evaluated the hair Se content of nine gilts at 9 mo. of age that had been fed diets with .3 ppm inorganic Se. Hair samples were collected from the shoulder, back, rump, front-leg, bacon, and hind-leg and washed of residue. Hair Se concentrations in the lower body extremities were higher ($P < .05$) than hair from the upper body. Hair diameter did not differ by body location. The third experiment analyzed hair samples collected from a total of 72 sows from two commercial sow herds from parity 1 to 6 that had been fed .3 ppm Se. Hair Se concentration decreased linearly ($P < .01$) as sow parity increased. These results suggest that hair Se may be a good indicator of the pigs Se status, and that pig genetics, and longevity in the reproducing herd may affect the Se status of the herd and the pig's Se requirement.

Key Words: Selenium, Hair, Pigs

196 Effects of adding and removing dietary fat on growth performance and carcass characteristics of pigs from 25 to 120 kg. M. De La Lata*, M.D. Tokach, S.S. Dritz, R.D. Goodband, and J.L. Nelssen, *Kansas State University, Manhattan*.

A total of 525 barrows and 525 gilts (PIC C22 × 337) with an initial weight of 25 kg were used to determine the carryover effects of adding and removing dietary fat on growth performance and carcass characteristics. Barrows and gilts were blocked by gender and weight and allotted to one of six dietary treatments in a randomized incomplete block design with 25 pigs/pen. The corn soybean meal-based diets contained either 0 or 6% choice white grease and were fed in four phases. The dietary treatments consisted of six different sequence arrangements of the diets across the four phases. The phases were 25 to 45, 45 to 70, 70 to 90 and 90 to 115 kg. The six diet sequence arrangements expressed as percent added fat for the four phases, respectively were 0,0,0,0; 6,6,6,6; 6,0,0,0; 6,6,0,0; 6,6,6,0; and 0,6,0,6. During phase 2, ADG was increased ($P < .01$) for the added fat treatments. For the overall experiment, ADG was not affected ($P > .44$) by dietary treatments. During every phase, G/F was increased ($P < .01$) for treatments containing 6% added fat, regardless of the dietary fat level fed in the previous phase. Treatments containing 6% added fat in three phases or in all phases had the greatest ($P < .05$) G/F. Treatments containing no added fat or only during phase 1 had the lowest ($P < .05$) G/F. Treatments containing added fat during 2 phases had intermediate feed efficiency. Back-fat depth was increased ($P < .05$) and FFLI decreased ($P < .05$) for the dietary treatment containing 6% added fat in all phases with no differences ($P > .50$) observed among the rest of the treatments. The FFLI for the six treatments were 49.4, 48.6, 49.3, 49.5, 49.3, and 49.1, respectively. The results from this experiment indicate that no carryover effect exists by adding and removing dietary fat during the different phases, and that the best overall performance was obtained when adding 6% fat during the first three phases of growth.

Key Words: Finishing pigs, Fat, Carryover

197 Economics of adding fat and increasing lysine:calorie ratio in diets for gilts from 27 to 120 kg. M. De La Lata*, M. Langemeier, S.S. Dritz, M.D. Tokach, R.D. Goodband, and J.L. Nelssen, *Kansas State University, Manhattan*.

Growth performance data from a total of 1,200 gilts (PIC C22 × 337; initially 27 kg) were used to evaluate income over feed cost from various dietary lysine regimens. Pigs were allotted to one of eight dietary treatments with 25 pigs/pen and six pens/treatment. A total of 64 income over feed cost alternatives were created from the combination of eight dietary treatments, four scenarios for ingredient and hog base prices,

and two different packing plant grids. The eight dietary treatments were fed in four phases and consisted of corn-soybean meal-based diets arranged in a 2 × 4 factorial with 0 or 6% added fat and four increasing lysine:calorie ratios in each phase (as described in J. Anim. Sci. 77(Suppl. 1):197). The prices used were corn at \$.075/kg for scenarios 1,2,3, and \$.104/kg for scenario 4, soybean meal at \$143/tonne for scenarios 1,2,3, and \$194/tonne for scenario 4, choice white grease at .265, .441, .220, and \$.331/kg for scenarios 1,2,3, and 4, respectively, and hog base carcass at \$90.6/100 kg for scenarios 1,2,3, and \$152.8/100 kg for scenario 4. The marketing grids were fixed premiums and discounts for grid 1 and an index representing a percentage of hog base price for grid 2. Data were analyzed using first and second-degree stochastic dominance to indicate preferred scenarios based on profit and risk. Using grid 1, the fourth lysine:calorie ratio regimen with added fat was the preferred alternative for the low fat price scenarios. The fourth lysine:calorie ratio regimen without added fat was the preferred alternative for the high fat price scenario. Using grid 2, the third and fourth lysine:calorie ratio regimens with added fat were the preferred alternatives for the low fat price scenarios, and the fourth lysine:calorie ratio regimen with or without added fat were the preferred alternatives for the high fat price scenario. Adding fat to the diets increased feed cost per unit of gain, but resulted in heavier carcasses with an increased income over feed cost in all scenarios except for the one using high cost fat.

Key Words: Gilts, Fat, Economics

198 Effects of different sources of phosphorus and calcium on urine pH and ammonia emission. I.B. Kim*, D.H. Kim, P. Ferket, and T. van Kempen, *North Carolina State University, Raleigh, NC*.

Three trials were conducted to evaluate the effects of different sources of phosphorus and calcium on ammonia emission of swine manure. Dicalcium phosphate (DCP), monocalcium phosphate (MCP), and phosphoric acid (PA) were used as the supplementary phosphorus sources. The calcium sources used limestone (L; CaCO₃) and calcium sulfate (CS; CaSO₄). In Exp. 1, eight crossbred barrows (initial BW 67.4 kg) were used for measuring urine pH. Dietary treatments were control (DCP+L), MCP (MCP+CS), PA (PA+CS), and HCl (L+CS+HCl) diet. All diets were formulated to be equal in calories, nitrogen, phosphorus, and calcium. Treatments were tested in a Latin Square design (LSD). Free access to water was provided and 80 g feed on each kg metabolic BW was given twice daily, at 0600 and 1800. After a 5-day adaptation, urine samples were collected. In urine pH, PA and MCP diet (5.85.38 and 5.73.30) decreased compared to control (6.86.24; $P < .05$). In Exp. 2, twenty growing barrows (BW 22.5 kg) were allotted to two respiration chambers. These chambers were used for determining the effect of two dietary calcium sources (L and CS) on ammonia emission. Treatments were allotted using a cross-over design. Feed and water were provided ad libitum. Ammonia emission was monitored semi-continuously using FTIR over 7 days after 7-day adaptation. The CS diet increased ammonia (1%) compared with control. Exp. 3 (BW 43.1 kg) was conducted as Exp. 2 for determining the effect of two dietary phosphorus sources (DCP+L and PA+CS diet). The PA+CS diet decreased the overall ammonia emission (30%, $P < .05$). Therefore, replacing dicalcium phosphate in the diet with phosphoric acid results in a decrease in urine pH that leads to reductions in ammonia emission.

Key Words: Phosphorus, Calcium, Ammonia emission

199 Odor characteristics of swine manure and nutrient balance of grow-finish pigs fed diets with and without distillers dried grains with solubles. M.J. Spiehs*, M.H. Whitney, G.C. Shurson, and R.E. Nicolai, *University of Minnesota, St. Paul*.

A 10-wk trial was conducted to determine odor characteristics of swine manure and energy, nitrogen, and phosphorus balance of grow-finish pigs fed diets with and without distillers dried grains with solubles (DDGS) from ethanol plants in the Minnesota-South Dakota region. Sixteen PIC barrows weighing 57.5 ± 4.1 kg were randomly assigned to one of two dietary treatments (8 pigs/treatment): control (0% DDGS) and 20% DDGS. A three-phase diet sequence was fed. Total lysine and P levels were identical for diets in each phase. Manure from each pig in collection cages was collected daily except during the last 3 d of wks 2, 6, and 10, when total fecal and urine collection was conducted for the nutrient balance measurements. Urine and feces were mixed and emptied into