of organic phosphorus (P). Total P and organic P in feces from control diet were higher (P<0.05) than the feces from diets with supplemented phytase, but nitrogen content of feces was not (P>0.05) influenced by dietary treatments. Phytase supplementation had no effect on pH, NH_3 and VFAs of slurry. The pH of fresh pig feces diluted with water (1:2.5) and urine (1:2.5) were, respectively, 5.56±0.28 and 7.08±0.18. The pH of feces diluted with urine decreased by 2.8% within 2 days and then increased by 17.1%, the pH of feces diluted with water decreased by 3.7% within 2 days and then increased by 21.2% during 14-d storage. The NH_3 emission from feces diluted with water was lower (P<0.01) than feces diluted with urine within 14-d storage period. The emission of NH_3 was correlated ($r = 0.81$) with pH in slurry within a pH range from 5.5 to 8.2. NH_3 emission and the content of VFAs in slurry increased during the 14-d storage and these increases were dependent on the amount of ammonium in slurry. In summery, phytase supplementation improved the digestibility of organic P and reduced the P content in the feces, but did not decrease the production of ammonia and VFAs of slurry. Urine or ammonium amount in slurry increased its pH and produced more NH_3. NH_3 emission and the content of VFAs in slurry increased during the 14-d storage periods.

Key Words: Swine manure, Phytase, Ammonia

200 Effect of high available phosphorus (HAP) corn and phytase on phosphorus (P) excretion in finishing beef cattle. S. L. Hankins*, J. D. Arseneau, S. A. DeCamp, R. P. Lemenager, and A. L. Sutton, *Purdue University, West Lafayette, IN.*

Two trials were conducted to determine the effect of microbial phytase (PHY) and HAP corn substitution for normal corn (NC), on the nutrient digestibility and performance of finishing beef steers. In Exp. 1, four crossbred steers (Initial BW=345 kg) were used in a 4X4 Latin square design and fed four high concentrate diets ad libitum. The diets were: 1) NC/15% corn silage (CS) balanced to NRC (1996) specifications for protein, vitamins and minerals (STD), 2) diet 1 plus 0.10% PHY (STD+PHY), 3) diet 1 with HAP corn replacing NC and 15% CS (HAP), and 4) diet 3 with 0.10% PHY (HAP+PHY). No supplemental P was added to the diets. Steers were adapted to metabolism stalls for five days prior to trial initiation. Total feces and urine were collected following a 9 d diet adaptation and 5 d collection. Exp. 2 utilized 48 crossbred steers (Initial BW=273 kg) individually fed a high concentrate diet with no supplemental P for a 168 d feeding period. Steers were allotted to four TRT including: 1) STD; 2) STD+PHY; 3) STD, limit fed to 85% of ad lib intake (LIM); and 4) STD+PHY, limit fed to 85% of ad lib intake (LIM+PHY). Limit fed steers were increased to ad lib intake starting on d 75. Steer weights were taken at the initiation, every 28 d and at the completion of the trial. Steers were harvested (approx. 567 kg BW) and carcass data were collected after a 48 h chill. Four steers from the STD and STD+PHY diets (n=8) were placed in metabolism stalls for collection of urine and feces during the last period. In Exp. 1, total ammonium N was decreased with PHY addition to the normal corn diet, but was increased with PHY addition to HAP corn diets, creating an interaction (P<.05). There was a trend towards increased N retention and reduced N excretion with PHY addition. In Exp. 2, addition of PHY increased DMI and ADG, but reduced G:F (P<.05). PHY inclusion reduced fecal Cu and S concentrations, but increased fecal propionate. In this study, PHY addition to a beef diet did not affect N or P digestibility. Trends observed in this beef study warrant further investigation with larger numbers of animals, especially in the areas of N retention/excretion and cation balance.

Key Words: Cattle, Excretion, Phosphorus

201 Effects of dietary crude protein reduction on pig performance, manure composition, aerial ammonia, hydrogen sulfide, and odor levels in swine buildings. B.E. Hill*[1], D.C. Kendall[2], S.L. Hankins[1], S.A. Trapp[1], B.T. Richert[1], D.T. Kelly[1], A.L. Sutton[1], G.L. Allee[2], T.A. van Kempen[3], and W.J. Powers[4], [1]*Purdue University, W. Lafayette, In,* [2]*University of Missouri, Columbia,* [3]*North Carolina State University, Raliegh,* [4]*Iowa State University, Ames.*

An experiment was conducted with grow-finish pigs (n=200) to evaluate dietary crude protein reduction of swine diets to reduce aerial pollutants and nutrient excretion. Pigs (initial BW=92.3 kg) were placed in two identical, environmentally controlled rooms (5 pigs/pen, 5 pens/room; 50 pigs/rep) with treatments rotating between rooms. Diets were fed for 4 weeks and consisted of either a control, corn-soybean diet (13.1% CP, .52% true ileal digestible lys (TIDLys) for the barrows and 14.2% CP, .59% TIDLys for the gilts; CONT) or a reduced CP diet with supplemental synthetic amino acids (9.7% CP, .52% TIDLys for the barrows and 10.6% CP, .59% TIDLys for the gilts; LCP). Aerial ammonia concentration (AAC), hydrogen sulfide (HS), and detection threshold of odor (DT) samples were taken at wk 2 and 4 from both room and exhaust air. Ultrasound measurements and manure samples were collected at wk 0 and 4. Pigs fed CONT or LCP diets had similar overall ADG (790 vs. 784 g/d), overall G:F (.304 vs. .297), and ADFI (2601 vs. 2649 g/d). Pigs fed LCP had greater wk 4 loin depth (75 vs. 72 mm; P<.019), numerically higher backfat thickness (17.9 vs. 16.9 mm) and greater total loin depth increase (11.9 vs. 9.4 mm; P<.003). By wk 4, there was a 60.4% reduction in AAC (P< .04) from room air and 52.2% reduction in the exhaust air AAC (13.4 vs 28.1 ppm; P< .0003) when pigs were fed LCP diets. At wk 4, the stored manure from pigs fed LCP diets had 29.80% less total-N (P< .0001), 30.6% lower ammonium-N (P< .0001), 35.8% less total-N accumulation in the manure (P<.01), and a lower manure pH (7.25 vs. 7.61; P<.0001). The LCP diet was effective at reducing AAC, manure N, and manure pH while increasing final loin depth. In addition, if adequate amino acid levels are included in the diet, growth performance is comparable to a diet without synthetic amino acids.

Key Words: Pig, Odor, Manure Composition

202 Nutrient Composition of Swine Lagoons and Hoop Barn Manure. J.M. DeRouchey*, R.D. Goodband, J.L. Nelssen, M.D. Tokach, S.S. Dritz, and J.P. Murphy, *Kansas State University, Manhattan.*

In accordance with state law, Kansas producers had designed nutrient management plans and applied manure to their fields using book values for swine manure composition. Concern was raised that these values are not applicable for all types of operations. This study was designed to determine the impacts of production phase and season of the year on the nutrient levels in swine manure. A total of 236 lagoon and 35 hoop barn manure samples were collected. Starting in February, 2000, lagoon samples were collected and analyzed every two months from five different types of production systems (sow, nursery; wean-to-finish, finish, and farrow-to-finish with a total of 9, 8, 7, 10, and 8 lagoons sampled, respectively). Manure from hoop barns (finishing only) also was collected and analyzed. Sampling technique and time of sampling each month was uniform across all sites. Average concentrations for total N and P were 1,402 and 204 ppm, respectively; however, the variation in concentration was great for both N (SEM=420) and P (SEM=80). Lagoon effluent from finishing (1,820 ppm) and wean-to-finish (1,852 ppm) lagoons had greater (P < 0.05) N compared to sow (967 ppm) and farrow-to-finish (810 ppm) lagoons. Phosphorus in farrow-to-finish (106 ppm) lagoons was lower (P < 0.05) than in wean-to-finish (302 ppm) lagoons. For seasonal characteristics, total N decreased (linear, P < 0.05) from February (1,571 ppm) until December (1,241 ppm) with the largest decline occurring between June (1,635 ppm) and August (1,239 ppm). Phosphorus also was influenced by season (quadratic, P < 0.05) with the highest levels occurring during June (287 ppm) and August (240 ppm) and the lowest during February (152 ppm) and December (212 ppm). For hoop barn manure, average concentrations for total N and P were 8,678 and 4,364 ppm, respectively. Therefore, season and type of production phase affects the nutrient content of swine lagoons. As a result of this project, Kansas producers are using individual analyses from their lagoons when developing nutrient management plans.

Key Words: Swine Lagoons, Hoop Barn, Nutrient Management

203 Infrared spectroscopy as an optical nose for predicting odor sensation. T.A.T.G. van Kempen*[1], W.J. Powers[2], and A. Sutton[3], [1]*North Carolina State University,* [2]*Iowa State University,* [3]*Purdue University.*

Quantifying odor is important for objectively assessing the impact of animal production systems on surrounding areas. A possible method that has received little attention is mid infrared spectroscopy (FTIR). Gases that contribute to odor have a unique infrared spectrum, and the advantage of FTIR over electronic noses or gas chromatography is that theoretically all these gases can be analyzed instantaneously. To determine the feasibility of FTIR for predicting odor, 27 air samples analyzed