

## Odor and Nutrient Management

**293P The effect of probiotic (*Bacillus* product) on growth performance and fecal consistency of growing-finishing pigs.** S. Nitikanchana\*, M. D. Tokach, S. S. Dritz, J. M. DeRouchey, R. D. Goodband, and J. L. Nelssen, *Kansas State University, Manhattan*.

A total of 1,099 pigs (PIC 1050 × 337; initially 34 kg) were used in a 104-d study to determine the influence of a *Bacillus* product and diet type on growth performance, carcass traits, fecal consistency, and pen cleaning time in growing pigs raised under commercial conditions. Pens were allotted in a completely randomized design with 26 to 27 pigs per pen and 7 replications per treatment. Treatments were arranged as a 3 × 2 factorial with main effects of *Bacillus* product (0, 1x, or 10x) and diet type (corn-soybean meal or a by-product diet with 30% dried distillers grains with solubles in all phases and 20% bakery until 54 kg). The dose of *Bacillus* in the diet was approximately 200 million and 2 billion cfu/g for the 1x and 10x levels, respectively. Overall (d 0 to 104), no differences were found in growth performance or carcass composition for pigs fed the *Bacillus* product; however, pigs fed the 1x level of *Bacillus* tended (quadratic,  $P = 0.10$ ) to have the lowest ADG (998, 976, and 985 g for 0, 1x, and 10x *Bacillus* level, respectively). Manure texture score tended to increase (linear,  $P = 0.07$ ) as *Bacillus* dose increased, indicating that pigs fed the *Bacillus* product had firmer stools. Wash time was numerically reduced (linear,  $P = 0.16$ ) as *Bacillus* level increased in the diet (10.8, 10.6, and 9.9 min for 0, 1x, and 10x *Bacillus* level, respectively). For diet formulation, pigs fed the diet containing by-products had increased ( $P = 0.01$ ) ADFI compared with pigs fed the corn-soybean meal diet (2629 vs. 2537 g, respectively). With no difference in ADG, feed efficiency was poorer ( $P < 0.01$ ) for pigs fed byproduct diets (0.38 vs. 0.39). Pens that contained pigs fed byproduct diets required more ( $P < 0.01$ ) time to wash (11.6 vs. 9.3 min), which appeared to be the result of looser manure texture ( $P = 0.09$ ) and increased ( $P = 0.08$ ) manure buildup. The *Bacillus* product tested did not improve growth performance, but altered fecal consistency and barn wash time.

**Key Words:** *Bacillus*, by-products, fecal consistency, pigs wash time

**294P Evaluation of a commercial ozone treatment system to improve swine slurry.** P. M. Walker<sup>1</sup>, A. R. Omer\*<sup>1</sup>, M. S. Brewer<sup>2</sup>, K. R. Cadwallader<sup>2</sup>, and T. R. Kelley<sup>3</sup>, <sup>1</sup>*Illinois State University, Normal*, <sup>2</sup>*University of Illinois, Urbana*, <sup>3</sup>*Eastern Carolina University, Greenville*.

Reducing volatile organic compounds (VOC) and odor emissions, of swine slurry help producers to meet existing and future environmental regulations. The objective of this study was to evaluate one technology designed to reduce odor emissions. The facility utilized was an environmentally controlled grow-finish building constructed over a manure pit capable of holding 408,297 L (107,730 gal) of slurry. During treatment the pit contained 170,126 L (44,888 gal) of slurry. The system injected air that was previously exposed to UV light at a rate of 0.18 cmm (6.25cfm) into slurry pumped at 379 lpm (100 gpm). This was equivalent to exposing the entire pit contents once every 7.5 h over a 96 h treatment period. Prior to treatment, slurry was analyzed to contain 4.61%solids, 6.8 pH,  $482.5 \pm 3.54$  mg:l settable solids (SS),  $2,175 \pm 139$  mg:l total suspended solids (TSS),  $220.2 \pm 3.8$  ppm NH<sub>3</sub>, less than minimum detection limits of dissolved oxygen (DO),  $59,275 \pm 3,866$  mg:l chemical oxygen demand (COD),  $0.49 \pm 0.01\%$ N and  $1.55 \pm 1.15\%$ P with a 0.3:1 N:P ratio. Following 72 h solids concentration was lowered ( $P < 0.05$ ) to 1.45%; SS were reduced ( $P < 0.05$ )

96.4%; TSS were reduced ( $P < 0.05$ ) 77.9%; NH<sub>3</sub>, DO and COD were not significantly different; N was lowered ( $P < 0.05$ ) 42.9% to 0.28%; and, P was lowered ( $P < 0.05$ ) to below detection limits. No significant changes between 72 h and 96 h in any of the characteristics measured were observed. Four air sample bags were collected before treatment and following 48 h, 72 h, and 96 h of treatment with subsequent analyses by a trained human odor panel (n = 8). The recognition threshold (lowest dilution concentration that odor could be recognized) before treatment was  $1,382 \pm 74$  and was significantly lower after 48 h ( $205 \pm 69$ ). Odor intensity was significantly higher before treatment than after 48 h comparing mean intensities of  $3.14 \pm 0.26$  and  $2.29 \pm 0.39$ , respectively. No changes ( $P < 0.05$ ) in odor intensity or threshold were detected between 48 h and subsequent observations at 72 h and 96 h. Under production scale conditions the commercial ozone treatment system evaluated can reduce odor and can reduce the concentration of selected VOCs of swine slurry.

**Key Words:** odor, N:P ratio, swine slurry

**295P Effects of sericite supplementation on nutrient digestibility, blood profiles, and noxious gas emission in growing pigs.** H. Y. Beak\*, X. Y. Guo, and I. H. Kim, *Department of Animal Resource & Science, Dankook University, Cheonan, Choongnam, South Korea*.

This study was conducted to assess the effects of sericite on nutrient digestibility, blood profiles, and noxious gas emission in growing pigs. Six [(Duroc × Yorkshire) × Landrace] pigs were used in a 3 × 3 Latin square design. Dietary treatments included 1) CON (basal diet), 2) T1 (CON + 0.5% sericite), 3) T2 (CON + 1.0% sericite). Each experimental period lasted 7 d. Pigs were fed diets containing Cr<sub>2</sub>O<sub>3</sub> (0.2%) and after 5 d adaptation period to the diet, fecal samples were collected on d 6 and 7 of each period. All pigs were bled on d 0 and d 7 of each period. The GLM procedure of SAS (1998) was used to determine the treatment and time effects. No time effect or interaction between treatment and time were observed. Throughout the entire experimental period, the dry matter (76.5, 79.5 vs 82.2%) and nitrogen (78.8, 82.7 vs 84.3%) digestibility was improved ( $P < 0.05$ ) in the T1 and T2 treatments compared with CON treatment. There was no difference in energy digestibility among the 3 treatments. The concentration of Fe (146, 146 vs 96 µg/dLin blood was decreased ( $P < 0.05$ ) by T2 treatment at the end of the experiment, and the TIBC was not affected by any treatments during the experiment period. No differences were observed in fecal NH<sub>3</sub>, H<sub>2</sub>S, and total mercaptans during the whole experiment. In conclusion, diets supplemented with 0.5 or 1% sericite may prove effective in improving nutrient digestibility and Fe concentration can be decreased by 1% sericite in growing pigs.

**Key Words:** sericite, noxious gas emission, growing pigs

**296P Effects of dietary fermented wheat by *Bacillus subtilis* on growth performance, nutrient digestibility, microbial shedding and fecal noxious gas emission in growing pigs.** X. Y. Guo\*, S. M. Hong, and I. H. Kim, *Department of Animal Resource & Science, Dankook University, Cheonan, Choongnam, South Korea*.

This research was conducted to evaluate the effect of fermented wheat (FW) by *Bacillus subtilis* on growth performance, nutrient digestibility, microbial shedding, and fecal noxious gas in growing pigs. A total of 120 pigs with initial BW of  $28.8 \pm 1.81$  kg [(Landrace × Yorkshire) × Duroc] were randomly allotted into 1 of 5 dietary treatments with 6 replicate pens per treatment and 4 pigs per pen. Every