

136 Comparison of different antimicrobials and antimicrobial alternatives on nursery pig performance. T. P. Keegan*, J. M. DeRouche, J. L. Nelssen, M. D. Tokach, R. D. Goodband, S. S. Dritz, and C. W. Hasted, *Kansas State University*.

Three experiments were conducted to compare the effects of in-feed antimicrobials and alternatives on nursery pig performance. In Exp. 1, 720 pigs (5.8 kg and 18 ± 2 d of age) were fed one of eight diets in a research facility: 1) Control with no additives; 2) carbadox (55 mg/kg); 3) Lac-toSacc (0.2%); 4) Bio-Plus 2B (0.05%); 5) Bio-Mos (0.3%); 6) Probios (1.6% from d 0 to 14 and 0.8% from d 14 to 21); 7) BioSaf (0.3%); or 8) Biomate Yeast Plus (0.1%). In Exp. 2, 320 pigs (5.3 kg and 14 ± 2 d of age) were fed diets 1 thru 5 from Exp. 1 in a commercial facility. In Exp. 3, 320 pigs (4.9 kg and 14 ± 2 d of age) were fed in the same commercial facility as in Exp. 2 and diets included: 1) Control with no additives; 2) carbadox (55 mg/kg); 3) Denaguard/CTC (38 mg/kg tiamulin, 441 mg/kg chlortetracycline); 4) Neo-Terramycin (154 mg/kg neomycin sulfate, 154 mg/kg oxytetracycline HCl); or 5) Bio-Mos (0.3%). In Exp. 1, pigs fed the diet containing carbadox had increased ($P < 0.05$) ADG and feed efficiency (G/F) compared to pigs fed the control diet. There was no difference in performance between pigs fed all other diets and pigs fed the control diet ($P > 0.05$). In Exp. 2, pigs fed the control diet or the diet containing Bio-Mos had greater ($P < 0.05$) ADG and ADFI compared to pigs fed the diet containing Bio-Plus 2B, but none of the diets improved performance compared to the control ($P > 0.05$). Because a growth response to carbadox was not observed in Exp. 2, Exp. 3 was conducted to evaluate different antibiotics. Pigs fed Denaguard/CTC or Neo-Terramycin had greater ($P < 0.05$) ADG and ADFI compared to pigs fed the control diet. There was no difference between pigs fed the control diet or diets containing carbadox or Bio-Mos ($P > 0.16$). These results indicate that antibiotic alternatives did not consistently improve growth performance. The variation in response to the in-feed antimicrobial sources in Exp. 3 illustrates the need to determine the most appropriate antimicrobial on an individual farm basis.

Key Words: Nursery Pig, Yeast, Antimicrobials

137 Effect of dietary sodium chlorate on growth performance of weaned pigs. T. E. Burkey*, S. S. Dritz, and J. E. Minton, *Kansas State University*.

Addition of sodium chlorate (CHLOR) may offer an alternative to dietary antibiotics for nursery pigs. In the present study, we evaluated dietary CHLOR at 50, 100 or 200 ppm in a 31-d growth assay. Additional treatments included a negative control (CON) with no added antimicrobial, and a positive control with added carbadox (CARB) at 50 ppm. Weaned, crossbred barrows and gilts ($n=240$; 6.4 ± 0.8 kg initial weight) were blocked by sex and weight at weaning and allotted to one of five dietary treatments. There were eight pens per treatment and six pigs per pen. Treatments were applied in both Phase I (d 0 to 14) and Phase II (d 15 to 31) diets. The performance parameters of ADG, ADFI and F:G were calculated and analyzed corresponding to feeding phase. ADG during phase I was 260, 260, 230, 250 and 270 ± 1 g/d and during Phase II was 600, 620, 600, 590 and 600 ± 2 g/d for CON, 50, 100, 200 ppm CHLOR, and CARB, respectively, and was not significantly affected by treatment. Similarly, neither ADFI or G:F were affected by treatment in either phase. In general, dietary antibiotics improve growth performance in nursery pig environments where pathogen load may impede pig growth. However, CARB did not stimulate a growth response in the current study. Therefore, a beneficial effect of CHLOR on nursery pig growth cannot be ruled out in nursery environments that also elicit a growth response to dietary antibiotics.

Key Words: Sodium Chlorate, Carbadox, Weaned Pigs

138 Effects of feeding levels and particle size of Biotite V^(r) on growth performance, nutrient digestibility and fecal NH₃-N and volatile fatty acids in nursery pigs. W. B. Lee¹, I. H. Kim^{*1}, J. W. Hong¹, O. S. Kwon¹, B. J. Min¹, K. S. Shon¹, J. H. Cho¹, and Y. K. Jung², ¹Dankook University, Korea, ²Seobong Biobestech Co., Ltd, Korea.

This experiment was conducted to investigate the effect of Biotite V^(r) (BT) on growth performance, nutrient digestibility and fecal gas emission in pigs. A total of 100 nursery pigs (initial body weight 13.12 ± 0.15 kg) were used in a 21-d growth assay. The five treatments were:

control (CON, basal diet), BT0.5-200 (basal diet + 0.5% BT, 200mesh), BT1.0-200 (basal diet + 1.0% BT, 200mesh), BT0.5-325 (basal diet + 0.5% BT, 325mesh) and BT1.0-325 (basal diet + 1.0% BT, 325mesh). Each treatment had four replicates with five pigs per replicate. ADG, ADFI, gain/feed and nutrient digestibility were not different among the treatments ($P > 0.05$). Fecal NH₃-N concentration of pigs fed the BT325 diets was lower than that of pigs fed the BT200 diets ($P = 0.01$). The BT treatments reduced fecal volatile fatty acids compared to the CON (propionic acid, $P = 0.01$; butyric acid, $P = 0.01$; acetic acid, $P = 0.02$). Especially, fecal propionic acid concentration of pigs fed the BT325 diets was lower than that of pigs fed the BT200 diets ($P = 0.02$). In conclusion, the results obtained from this feeding trial suggest that dietary BT for nursery pigs has effects on fecal noxious gas emission.

Key Words: Pigs, Biotite, Noxious Gas Emission

139 Relative phosphorus bioavailability in growing pigs fed diets supplemented with phytase from transgenic alfalfa leaf meal or microbial sources. K. L. Saddoris* and T. D. Crenshaw, *University of Wisconsin-Madison*.

In earlier trials phytase expressed in transgenic alfalfa leaf meal (tAfP) improved P bioavailability in pigs and chicks more effectively than predicted from laboratory assays of phytase activity. In the current trial 72 pigs (~14 kg) were randomly assigned to one of 12 diets designed for slope-ratio comparisons of inorganic P (iP), microbial phytase (NP, Natuphos[®] 5000, BASF) and tAfP. Pigs were individually housed for the 4-wk trial. Treatments included corn-SBM diets fortified with iP (dicalcium phosphate) to 0.40, 0.45, 0.50, and 0.55% total P without phytase, or 0.40% P diets with NP (500, 750, and 1000 FTU/kg) or tAfP (80, 120, 160, 200, and 240 FTU/kg). Amounts of tAfP (150 FTU/g) ranged from 0.53 to 1.60 g/kg diet. The tAfP range was based on observations from earlier trials in which maximum P bioavailability responses to tAfP occurred at 200 FTU/kg diet. In addition to ADG, ADFI, and GF, bone mineral content (BMC) gain was calculated from DXA scans on d 0, 14, and 28 of the trial. Main effect responses of ADG, GF and BMC gain were improved ($P < 0.05$) among pigs fed iP and NP compared with those fed tAlf. Within iP and NP treatment groups, linear responses ($P < 0.01$) in BMC gain were observed as iP or NP levels increased, but a dose-response relationship was not detected ($P > 0.30$) in BMC gain of pigs fed tAfP. Over 28 d BMC gain was greater (9.36 g BMC/d) in pigs fed diets with NP at 1000 FTU/kg than pigs fed 0.40% iP diets (1.64 g BMC/d). Pigs fed tAfP to supply 240 FTU/kg failed to improve ($P > 0.20$) BMC gain (3.49 g/d) above that of pigs fed 0.40% iP diets (1.64 g/d). The failure to induce a dose response in BMC gain of pigs fed tAfP is not consistent with earlier trials and precludes inferences about relative phytase bioactivity between NP and tAfP sources. Based on results from this trial inferences about relative relationships between bioactivity of tAfP and laboratory assays could not be established.

Key Words: Swine, Phosphorus, Alfalfa

140 Effect of dietary natural herb extract (Biomate^(r)) supplementation on growth performance and meat quality in finishing pigs. O. S. Kwon^{*1}, I. H. Kim¹, J. H. Kim², J. W. Hong¹, B. J. Min¹, W. B. Lee¹, K. S. Shon¹, J. H. Cho¹, J. C. Ra³, and J. H. Kim³, ¹Dankook University, Korea, ²Agribands Purina Korea, Inc., ³RNL Life Science Ltd. Korea.

A total of 86 pigs (LYD, 72.1 kg average initial BW) were used in a 56-d growth assay to determine the effects of dietary natural herb extract (Biomate[®]) on growth performance and meat quality in finishing pigs. Dietary treatments included: 1) CON (basal control diet), 2) BM1 (basal diet plus 0.05% Biomate[®]), 3) BM2 (basal diet plus 0.10% Biomate[®]) and 4) BM3 (basal diet plus 0.20% Biomate[®]). Through the entire experimental period, pigs fed the BM1 diet had increased ADG compared to pigs fed the CON diet ($P < 0.05$). BM1 and BM3 diets supported higher gain/feed than the CON diet ($P < 0.05$). Backfat thickness appeared to decrease in pigs fed BM diets compared to pigs fed the CON diet, however there was no significant difference among the treatments ($P > 0.05$). Hunter L*, a* and b* values of longissimus muscle were not affected by the dietary treatments ($P > 0.05$). Marbling and firmness of longissimus muscle were not different among the treatments ($P > 0.05$). Pigs fed BM1 and BM3 diets had higher longissimus muscle color than pigs fed the CON diet ($P < 0.05$). In conclusion, the results obtained