

## Nonruminant Nutrition

**128 Evaluation of corn distillers dried grains with solubles and a polyclonal antibody on growth performance and the ability of pigs to resist an infection from *Salmonella* Typhimurium.** M. Spiehs\*, G. Shurson, L. Johnston, and K. Seifert, *University of Minnesota*.

A two part study was conducted to determine if growth performance and the incidence of *Salmonella* shedding were influenced by the inclusion of 50% corn distillers dried grains with solubles, or a polyclonal antibody (IMT<sup>+</sup><sup>TM</sup>, CAMAS, Inc) in the diets of growing and finishing pigs. For Part 1, 135 pigs (14 kg initial BW) were blocked by weight and randomly allotted within block to one of three dietary treatments: corn-soybean meal control (C), C+ a polyclonal antibody (PCA), or a corn-soybean meal diet containing 50% corn distillers dried grains with solubles (DDGS). Diets were formulated to contain equivalent ME, apparent digestible Lys, total Ca, and available P across all diets in each of 5 phases. Overall ADG and ADFI for pigs fed the DDGS diets (690 and 1870 g/d, respectively) were less ( $P < 0.05$ ) than pigs fed the PCA diets (780 and 1970 g/d, respectively) or C diets (740 and 1960 g/d, respectively). Overall G:F for the pigs fed the DDGS diets (0.37) was less ( $P < 0.01$ ) than pigs fed PCA diets (0.39) and tended to be less ( $P = 0.09$ ) than pigs fed the C diet (0.38). Pigs fed the C and PCA diets had similar ADG, ADFI, and G:F. Part 2 of the study began on d 105 and involved randomly selecting 40 pigs (109 kg BW) for a disease challenge. Thirty pigs (10 C, 10 PCA, and 10 DDGS) were inoculated with *Salmonella* Typhimurium at d 7, 14, and 33. Ten pigs were not inoculated (NC). Overall *Salmonella* infection was low after each of the 3 inoculations. There were no differences between challenged and NC pigs, or among challenged pigs fed the three dietary treatments in *Salmonella* prevalence of fecal or tissue samples, or serum haptoglobin,  $\alpha_1$ glycoprotein, IgM, and IgG concentrations. These results indicate that growing-finishing pigs fed diets containing 50% DDGS will have decreased ADFI and ADG compared to pigs fed C or PCA diets. The disease challenge model used in this study was unsuccessful in producing an acute salmonellosis infection in finishing pigs inoculated with *Salmonella* Typhimurium.

**Key Words:** Salmonella, Distillers grains, Polyclonal antibody

**129 The effect of replacing specialty protein sources with synthetic amino acids in phase II nursery pig diets.** N. Z. Frantz<sup>\*1</sup>, S. S. Dritz<sup>1</sup>, M. D. Tokach<sup>1</sup>, J. M. DeRouchey<sup>1</sup>, R. D. Goodband<sup>1</sup>, J. L. Nelssen<sup>1</sup>, and J. L. Usry<sup>2</sup>, <sup>1</sup>*Kansas State University*, <sup>2</sup>*Ajinomoto-Heatland LLC*.

A 10-d growth study with 1,500 pigs (7 d after weaning and 6.6 kg BW) was conducted to determine the effects of replacing SBM with either fish meal, poultry meal, or synthetic amino acids in a phase II diet without plasma on nursery pig performance. Diets were corn-soybean meal based with 10% dried whey and 3% added fat. Diets were formulated to 4.5 g TID lysine/Mcal ME. The five dietary treatments formulated on a TID basis were: 1) a negative control diet containing 0.15% L-lysine HCl; 2) a positive control diet containing 0.3% L-lysine HCl, 0.15% DL-methionine, 0.1375% L-threonine, 2.25% fish meal, and 0.83% blood meal; or the negative control with 3) 4.5% fish meal, 4) 5% poultry meal, or 5) synthetic amino acids (0.525% L-lysine HCl with 0.25% threonine, 0.27% methionine, 0.125% valine, 0.10% isoleucine, and 0.025% tryptophan). From d 7 to 17 post-weaning, feeding pigs the positive control diet or the synthetic amino acid diet resulted in improved ( $P < 0.01$ ) ADG and G:F compared to pigs fed the negative control, fish meal, or poultry meal diets. Pigs fed the positive control or synthetic diet were heavier at d 17 ( $P < 0.01$ ) than pigs fed the negative control diet or diets containing fish or poultry meal. There was no treatment effect on ADFI ( $P > 0.34$ ). In summary, diets containing large amounts of synthetic amino acids appear to be a suitable replacement for specialty protein sources when formulated on a TID basis.

Table 1. The effect of different protein sources in phase II nursery pig diets.

	Negative control	Positive control	Fish meal	Poultry meal	Synthetic amino acids	SE
ADG, g	194 <sup>b</sup>	231 <sup>a</sup>	186 <sup>b</sup>	180 <sup>b</sup>	218 <sup>a</sup>	10
G:F	0.627 <sup>b</sup>	0.722 <sup>a</sup>	0.615 <sup>b</sup>	0.595 <sup>b</sup>	0.690 <sup>a</sup>	0.0190

<sup>a, b</sup> $P < 0.05$

**Key Words:** Nursery pigs, Protein sources, Synthetic amino acids

**130 The effects of dietary Biotite V supplementation on growth performance, nutrients digestibility and fecal noxious gas content in finishing pigs.** Y. J. Chen\*, O. S. Kwon, B. J. Min, K. S. Son, J. H. Cho, and I. H. Kim, *Dankook University*.

Previous research suggested that clay minerals such as zeolite and bentonite have beneficial effects for livestock. A commercially clay mineral additive is currently being marketed under the trade name of Biotite V (Seobong BioBestech Co., Ltd, Seoul, Korea). This experiment was conducted to evaluate the effects of dietary Biotite V (BV) supplementation on growth performance, nutrients digestibility and fecal noxious gas content in finishing pigs. A total of eighty pigs (initial BW 88.0±1.35 kg) were used in a 35 day growth trial. Pigs were blocked by weight and allotted to five dietary treatments in a randomized complete block design. There were four pigs per pen and four pens per treatment. Dietary treatments included: 1) Control (CON; basal diet), 2) 200 mesh BV1.0 (basal diet + Biotite V 1.0% 200 mesh), 3) 325 mesh BV1.0 (basal diet + Biotite V 1.0% 325 mesh), 4) 200 mesh BV2.0 (basal diet + Biotite V 2.0% 200 mesh) and 5) 325 mesh BV2.0 (basal diet + Biotite V 2.0% 325 mesh). Through the entire experimental period, there were not significant differences in ADG, ADFI and gain/feed among the treatments ( $P > 0.05$ ). With the addition of Biotite V in diets, DM and N digestibilities were increased significantly ( $P < 0.01$ ). Also, Ca and P digestibilities tended to increase in pigs fed Biotite V supplemented diets ( $P < 0.01$ ) compared to pigs fed control diet. Supplementation of Biotite V in the diet reduced the fecal NH<sub>3</sub>-N and volatile fatty acid (VFA) compared to CON treatment ( $P < 0.01$ ). In conclusion, supplementation of Biotite V can increase nutrients digestibility and reduce fecal NH<sub>3</sub>-N and volatile fatty acid (VFA) concentrations in finishing pigs.

**Key Words:** Biotite V, NH<sub>3</sub>-N, Finishing pigs

**131 Evaluating oregano oil as a growth enhancer in nursery pig diets.** C. R. Neill\*, J. L. Nelssen, R. D. Goodband, M. D. Tokach, S. S. Dritz, J. M. DeRouchey, K. R. Lawrence, and C. N. Groesbeck, *Kansas State University*.

A total of 224 nursery pigs (PIC L 327 L42), initially 5.85 ± 1.36 kg and 21 d of age, were used in a 28 d feeding trial. The objective of our study was to evaluate the effects of oregano oil with or without an in-feed antimicrobial on growth performance of weanling pigs. Oregano oil has been reported to have antimicrobial-like activity. Oregano oil is an extract derived from the Greek oregano herb, *Origanum vulgare*. The oregano oil (5%) is mixed with an inert carrier (95%) to make a premix that is added to the diet. There were four dietary treatments in a 2 × 2 factorial. Dietary treatments were fed in meal form and in two phases, which consisted of a negative control (without an antibiotic or oregano oil), or the control diet with neomycin (154 ppm) and oxytetracycline (154 ppm; NT), the control diet with oregano oil, or the control diet with both NT and oregano oil. Oregano premix levels were 0.10% in phase I (d 0 to 14) and 0.05% in phase II (d 14 to 28). Pigs were blocked by weight and randomly allotted to dietary treatments with seven pigs per pen and eight pens per treatment. Pigs were weighed weekly to determine ADG, ADFI, and G:F. There was no oregano oil by antibiotic interaction observed ( $P > 0.15$ ). From d 0 to 28 pigs fed diets containing NT had improved ( $P < 0.05$ ) ADG (420 vs 361 ± 12.2 g), ADFI (542 vs 481 ± 18.4 g), G:F (0.78 vs 0.75 ± 0.007) and final weight (17.6 vs 16.0 ± 0.84 kg) compared with pigs not fed NT. Adding oregano oil to nursery pig diets did not improve ADG (393 vs 388 ± 12.2 g), ADFI (512 vs 511 ± 18.4 g), or G:F (0.77 vs 0.76 ± 0.007) over the 28 d trial compared to pigs not fed oregano oil. In conclusion, oregano oil was not effective in enhancing growth performance in this experiment, whereas NT improved growth performance.

**Key Words:** Nursery pigs, Antimicrobial, Oregano