the same as that to MOS. When activated with MRF, AMΦ produced much less TNF-α if compared to AMΦ stimulated with MOS, β-glucan, or LPS. The TNF-α response to stimulation of MRF (164 pg/mL) and LPS (521 pg/mL) peaked at 2.5 mg/mL and 1 μg/mL, respectively (P<0.05). In assay 2, the level of ≥ 20 μg/mL of PMB significantly inhibited LPS-induced TNF-α. In assay 3, TNF-α production of AMΦ induced by β-glucan or LPS was substantially inhibited by PMB treatment (P<0.01). In contrast, MOS-induced TNF-α in the presence of PMB was reduced by only 4.2%. In general, the TNF-α response of AMΦ to stimulation by yeast components is dose-dependent. MOS and β-glucan, but not probably MRF, are potential immuno-stimulants and they appear to activate AMΦ by different mechanisms.

Key Words: porcine alveolar macrophages, TNF-α, yeast components

230 Effects of phenyllactic acid on growth performance, nutrient digestibility, microbial shedding, and blood characteristics in pigs. J. P. Wang*[1], H. J. Kim[1], I. B. Chung[2], J. H. Lee[1], R. Nobel[3], I. H. Kim[1], and S. H. Oh[3], [1]*Dankook University, Cheonan, Choongnam, Korea,* [2]*National Institute of Animal Science, Korea,* [3]*North Carolina A&T State University*.

Two experiments on weanling (Exp. 1, 6.27±0.73 kg, n=90) and growing pigs (Exp. 2, 21.73±1.29 kg, n=96, 56 d of age) were conducted to evaluate the effect of phenyllactic acid (PLA). In Exp. 1, treatments were: 1) CON, basal diet, 2) PC, CON + antibiotics, and 3) PLA, CON + PLA 0.5%. ADFI in pigs fed PC (739 g) and PLA (750 g) diets were increased (P<0.05) compared to CON (707 g) during the overall phase. PC and PLA tended to have a higher ADG and G:F from d 7 to 21 (P < 0.10). The digestibility of DM was highest on PLA on d 21, and N digestibility was higher in both PC and PLA treatment (P<0.05) on d 21 and 42. The white blood cell (WBC) and lymphocyte levels were significantly improved by the inclusion of antibiotics or PLA in the diet. In Exp. 2, the four dietary treatments were included: 1) CON, basal diet, 2) PLA0.1, CON + 0.1% PLA, 3) PLA0.2, CON + 0.2% PLA, and 4) PLA0.3, diet 1 + 0.3% PLA. G/F tended to increase when PLA was added (P=0.065). The digestibility for DM did not differ among treatments, while there was a tendency (P<0.10) for N digestibility to improve as the PLA levels increased with the highest value on PLA0.2 (quadratic effect, P<0.10). The lymphocyte concentration linearly increased (60.60, 61.45, 64.90, 65.15%) with increasing levels of PLA on d 42 (P=0.009). The WBC tended to increase as the PLA levels increased (P=0.085). In both experiments, there was no effect of treatment on fecal pH or the presence of lactic acid bacteria, but the concentration of E. coli in feces decreased in response to the addition of PLA (linear effect, P<0.001). In conclusion, adding PLA to the diet can result in the same growth performance with antibiotics of nursery pigs and may have a potential to stimulate immune system for both weanling and growing pigs; thus it may have merits as a replacement for antibiotics in pigs.

Key Words: phenyllactic acid, microbial shedding, pigs

231 Effects of probiotic supplementation on growth performance, blood immune-related cell population, meat quality and fecal ammonia gas emissions in finishing pigs. S. O. Shin*[1], R. Noble[2], H. D. Jang[1], T. X. Zhou[1], I. H. Kim[1], and S. H. Oh[2], [1]*Dankook University, Cheonan, Korea,* [2]*North Carolina A&T State University*.

A total of 80 pigs (65.42±1.16 kg) were used in a 10 week feeding trial to evaluate the effects of dietary complex probiotic supplementation on growth performance, immune-related cell population, meat quality, and fecal ammonia emissions in finishing pigs. Dietary treatments were: 1) NC (antibiotic-free diet), 2) PC (NC + 44ppm tylosin), 3) NCP (NC + 0.2% probiotics), and 4) PCP (NC diet + 22ppm tylosin + 0.1% probiotics). Each treatment had five replicate pens with four pigs per pen. Growth performance was not affected by treatment, while DM digestibility was higher (P<0.05) in PCP (78.66%) than other groups (74.62, 75.59, 74.29%, respectively). Both PC and PCP (80.87, 79.18%, respectively) had higher N digestibility (P<0.05) than NCP (74.71%). The yellowness (b*) value of M. logissimus dorsi color was significantly increased (P<0.05) in NCP compared to PC. Also, the pH of M. logissimus dorsi was significantly higheet (P<0.05) in the NC group. Total MUFA and total UFA in intramuscular fat were significantly higher (P<0.05) in NCP (35.11, 55.23%, respectively) than PC treatment (26.58, 48.55%, respectively). In fatty acid composition of back fat in M. logissimus dorsi, total SFA were significantly increased (P<0.05) by NCP (53.38 %) compared with NC and PCP treatments (39.62, 42.35%, respectively), while PC (49.37%) had higher (P<0.05) total SFA than NC (39.62%). UFA:SFA ratio was significantly higher (P<0.05) in NC (1.43) than PC and NCP treatments (0.97, 0.93, respectively), in addition, PCP (1.29) had higher (P<0.05) UFA:SFA ratio than NCP (0.93). Feces and urine (150g : 150g) were collected stored and fermented for 5 d to determine the odor emission. NH3 emission was significantly decreased (P<0.05) in NCP and PCP treatments (difference -78.33, -98.33 ppm, respectively) compared with NC and PC treatments (difference 165.00, 216.67 ppm, respectively). The results of the experiment indicated that dietary probiotics had positive effects on nutrient digestibility, meat quality and fecal odor emission gases in finishing pigs.

Key Words: probiotics, growth peroformance, finishing pigs

232 Evaluation of a commercial enzyme on growing pig performance. J.J. Jacela*[1], S.S. Dritz[1], M.D. Tokach[1], J.M. DeRouchey[1], R.D. Goodband[1], J.L. Nelssen[1], and P. Brown[2], [1]*Kansas State University, Manhattan, KS,* [2]*Agri-King Inc., Fulton, IL*.

A total of 1,129 pigs (BW=34.4 kg) were used in a 56-d study to evaluate the effect of a commercial enzyme on growth performance and its energy replacement value in swine diets. Pigs were blocked based on initial BW and allotted to 1 of 6 dietary treatments in a 2×3 factorial arrangement. Dietary treatments had increasing levels of fat (0, 2.5, and 5.0%) without or with added enzyme (0.05% Agri-king REAP®). The product used was a proprietary blend of enzymes that has β-glucanase, cellulase, and protease activity. Phase 1 was fed from 34 to 50 kg BW, Phase 2 from 50 to 73 kg BW, and Phase 3 from 73 to 91 kg BW. Diets were corn-soybean meal-based with 15% dried distillers grains with solubles (DDGS) and balanced to a constant lys:calorie ratio (2.98, 2.68. and 2.38 g/Mcal ME for phases 1, 2, and 3; respectively) within diet phase. Overall (d 0 to 56), there were no interactions (P>0.33) between the addition of enzyme and added fat for ADG, ADFI, or G:F. There was no difference (P>0.54) in ADG, ADFI, or G:F between pigs fed diets with and without added enzyme. However, pigs fed diets with increasing added fat had improved (linear; P<0.01) ADG and G:F. For every 1% added fat, G:F was improved by 1.3 and 1.2% in pigs fed with 2.5 and 5.0% added fat in their diets, respectively. In conclusion, the addition of the commercial enzyme did not impact growth performance of pigs in this study but ADG and G:F improved with the addition of fat in the corn-soybean meal-based diets with 15% DDGS.