

197 Growth and carcass traits of finishing pigs fed Paylean® were not compromised by diet formulations based on phytase. C. E. Pardo*, J. A. Kane, M. E. Glenn, D. K. Schneider, and T. D. Crenshaw, *University of Wisconsin.*

Improved performance traits of finishing pigs fed ractopamine (Paylean®, Elanco Animal Health) are well established, but concerns have arisen over the combined use of Paylean and phytase in diets formulated with no supplemental inorganic P (iP). This experiment was designed to evaluate the combination of Paylean and phytase (Natuphos®, 9400 G-concentrate, BASF) in diets for finishing pigs and to determine if additional iP was required. One hundred twenty crossbred (D x LW x LR) pigs were initially (50.5 ± 0.4 kg) fed diets with phytase (0 or 500 FTU/kg) for 4 wks. At 4 wks, pigs (82 ± 0.97 kg) were fed 1 of 5 diets for an additional 4 wk. Diets provided Paylean (0 vs 10 mg/kg, diets 1,2 vs 3,4,5), phytase (0 vs 500 FTU/kg, diets 1,3,5 vs 2,4) and iP (0.45 vs 0.65% total P, diets 1,3 vs 5). In diets with Paylean, total lysine levels were increased from 0.70% to 0.90%. As expected, ADG, feed efficiency, and carcass traits improved (P<0.05) with inclusion of Paylean in the diets. In pigs fed Paylean performance traits were not improved regardless of P level or source. However, pigs fed diets with Paylean and phytase tended (P < 0.15) to gain less than pigs fed diets with minimal P from iP. In conclusion, growth, feed efficiency and carcass traits of finishing pigs fed Paylean can be maintained with minimal supplemental P levels from either iP or phytase sources. An assessment of bone mineralization and skeletal integrity may alter inferences about needs for supplemental P.

Dietary Treatments

| Item | 1 | 2 | 3 | 4 | 5 | SEM |
|---|------|------|------|------|------|------|
| Paylean®, mg/kg | 0 | 0 | 10 | 10 | 10 | |
| Phytase, FTU/kg | 0 | 500 | 0 | 500 | 0 | |
| P equivalents, % | 0.45 | 0.45 | 0.45 | 0.45 | 0.65 | |
| ADG, kg/d 28 to 56 d ^{a,b,c} | 1.10 | 1.14 | 1.30 | 1.24 | 1.26 | 0.03 |
| Feed/gain 28 to 56 d ^{b,c} | 2.86 | 2.80 | 2.39 | 2.47 | 2.48 | 0.05 |
| Hot Carcass Wt., kg ^{a,c} | 88.7 | 89.1 | 90.7 | 92.7 | 93.3 | 1.33 |
| Back Fat, mm ^{a,c} | 21.0 | 22.3 | 19.3 | 18.8 | 20.1 | 1.02 |
| Loin Eye Area, mm ² ^{a,b,c} | 36.8 | 37.7 | 43.1 | 41.8 | 42.6 | 1.07 |

^a Blk, P<0.05. ^b Trt, P<0.05. ^c 1,2 v 3,4,5, P<0.05.

Key Words: Swine, Ractopamine, Phosphorus

198 Effect of dietary L-carnitine and ractopamine-HCl (Paylean®) on the metabolic response to handling in grow-finish pigs. B. W. James*¹, M. D. Tokach¹, R. D. Goodband¹, J. L. Nelsens¹, S. S. Dritz¹, J. M. DeRouchey¹, and J. C. Woodworth², ¹Kansas State University, ²Lonza, Inc.

Two experiments (384 pigs) were conducted to determine the interactive effect of dietary L-carnitine and ractopamine-HCl (RAC) on the metabolic response to handling. Experiments were arranged as split plots with handling as main plot and diet as sub plots (4 pens/trt). Carnitine (0 or 50 ppm) was fed from 38.5 kg to the end of the trials (120 kg) and RAC (0 or 20 ppm) was fed for the last 4 wk of each trial. At the end of each trial, two pigs per pen were assigned to each handling treatment. Gentle-handled pigs were moved at a moderate pace through a 150 m course with a 15deg loading ramp. Non-gentle handled pigs were moved at a faster pace, up a 30deg ramp, and were subjected to an electrical prod. Blood was collected immediately before and after handling in Exp. 1 and immediately after and 1 h after handling in Exp. 2. Feeding RAC increased (P<0.01) ADG and gain/feed. In Exp. 1 and 2, non-gentle handling increased (P<0.01) lactate dehydrogenase (LDH), lactate, cortisol, and rectal temperature, and decreased blood pH. In Exp. 1, a RAC x handling interaction (P<0.06) was observed for pH and temperature. Non-gentle handled pigs fed RAC had decreased pH and increased temperature and tended (P<0.09) to have higher lactate. Pigs fed RAC had increased LDH compared to pigs not fed RAC. Pigs fed carnitine had increased (P<0.03) lactate compared to pigs not fed carnitine. In Exp. 2, pigs fed RAC had lower (P<0.02) pH immediately after handling but pH returned to control levels (P>0.96) by 1 h post-handling. Lactate, LDH, cortisol, and temperature changes from immediately post-handling to 1 h post-handling were not different for pigs fed carnitine or RAC suggesting carnitine did not decrease recovery time of pigs subjected to non-gentle handling. These results suggest that pigs fed RAC are more susceptible to stress when handled aggressively

compared to pigs not fed RAC. Carnitine did not alleviate the effects of stress when fed in combination with RAC.

Key Words: Carnitine, Ractopamine, Pigs

199 Interactive effects between ractopamine HCl (Paylean(r)) and pantothenic acid in grow-finish pigs. C. N. Groesbeck*, R. D. Goodband, M. D. Tokach, J. L. Nelsens, S. S. Dritz, J. M. DeRouchey, B. W. James, T. P. Keegan, C. W. Hastad, K. R. Lawrence, N. A. Lenehan, and N. Z. Frantz, *Kansas State University.*

An experiment using 156 pigs (PIC, initial BW = 25.7 kg) was conducted to evaluate the interactive effects of ractopamine HCl (RAC; 0 or 10 ppm) and added pantothenic acid (PA; 0, 22.5, or 45 ppm) on growth performance and carcass composition. Pigs were blocked by weight and sex, and randomly allotted to one of six dietary treatments. There were two pigs per pen and 13 pens per treatment. The study was arranged as a factorial with main effects of PA and RAC. Pigs were fed the assigned PA levels from 25.7 kg to market (d 0 to 98) and RAC for 28 days prior to harvest at a commercial facility. Pigs were weighed and feed intake was determined every 14 d. Increasing added PA had no effect (P > 0.05) on ADG, ADFI, or feed efficiency (G/F) from d 0 to d 70. A PA gender interaction (P < 0.03) was observed for ADG and G/F from d 70 to 98. Increasing PA increased ADG (.93, 1.01, and 1.05 kg) and G/F (0.34, .36, and 0.38) in gilts, but there were no differences for ADG (1.09, 1.02, and 1.02 kg) and G/F (0.35, 0.35, and 0.34) in barrows. From d 0 to 98, G/F increased (P < 0.02) with increasing added PA (0.38, 0.40, and 0.41) in gilts, and no differences in barrows (0.39, 0.40, and 0.39). Added RAC increased (P < 0.001) ADG (1.11 vs 0.93 kg) and improved G/F (0.38 vs 0.33) for the last 28 d prior to market and for the overall trial. Increasing added PA had no effect (P > 0.05) on carcass composition. Adding RAC increased (P < 0.0001) longissimus area and percentage lean and decreased (P < 0.02) tenth rib fat depth. These results suggest that RAC improves growth performance and carcass lean, but has no interactive effects with added PA. Added PA increased ADG and G/F in gilts, but not in barrows.

Key Words: Pantothenic Acid, Ractopamine, Pigs

200 Effect of conjugated linoleic acid (CLA) on growth performance, backfat thickness and loin muscle area in pigs sorted based on initial leanness. M. Azain*, *University of Georgia.*

There has been considerable interest in the use of CLA as a repartitioning agent in swine. While the effects of dietary CLA have been consistent in rodent studies, they have been less reproducible in other species. A survey of published studies in pigs suggests that the variation in response may at least partially be explained by differences in the total amount of dietary fat and by differences in leanness of the pigs used. To test the latter, growing, individually-penned barrows were sorted into high (2.3 cm) and low (1.7 cm) tenth rib fat thickness groups using real time ultrasound at approximately 65 kg body weight. Within each group, pigs were assigned to either control or CLA dietary treatments. Pigs were fed a corn-soy diet with 15% CP and 0.85% lysine that was supplemented with either 1% soy oil (Control) or CLA (CLA-60) for 7 weeks. Body weight, feed intake and ultrasound measures of fat thickness and loin area at the tenth rib were determined weekly. There were no differences in final body weight (112 kg), gain (0.96 kg/d), or intake (2.49 kg/d) due to diet or initial leanness. Gain:Feed ratio was lower in high fat pigs compared to the low fat (0.38 vs 0.40, P < 0.01), but was not affected by CLA. Pigs that were fatter initially remained so during the study (High 2.68 vs Low 2.18 cm, P < 0.01). There was a numerical reduction in fat accretion in fat pigs fed CLA (High-Control, 0.37 vs High CLA, 0.20 cm, P < 0.20) and no effect of CLA on the low fat group. Calculated percent lean was greater in the low fat pigs (50.6 vs 48.5, P < 0.02) and numerically greater in CLA fed pigs (50.2 vs 49.0, P < 0.20). Overall, there were minimal effects of CLA on performance and carcass composition as determined by ultrasound. However, the greater reduction in fat accretion seen in pigs with high fat thickness is supportive of an interaction in the response to CLA with body composition.

Key Words: Ultrasound, Pigs, CLA