

180 Application of a blend of dietary antioxidants in nursery pigs fed either fresh or oxidized corn oil or DDGS. R. J. Harrell*, J. Zhao, G. Reznik, D. Macaraeg, T. Wineman, and J. Richards, *Novus International Inc., St. Charles, MO.*

This study evaluated the effects of a blend of antioxidants (AOX, AGRADOPLUS, Novus International Inc., St Charles, MO) with different sources of corn oil in nursery pigs. At weaning (~20 d of age), pigs were blocked by weight and sex and assigned to a pen (20-25 pigs/pen) and was randomly assigned to either 0 or AOX from 0 to 10 d postweaning. At 10 d, within an AOX treatment, pen was randomly assigned to one of 3 fat sources (fresh corn oil vs oxidized corn oil vs DDGS) to provide 7 pens/treatment. Pigs were fed 20 and 30% inclusion rate of DDGS from 10 to 21 and 21 to 42 d, respectively. Oxidized oil was fed to provide 7.5 meq peroxide value/kg diet. Nutrient adequate diets were fed ad libitum with equal calculated dietary fat levels by the addition of fresh corn oil. From 0 to 10 d postweaning, no differences in performance were detected with the addition of AOX ($P > 0.40$). From 10 to 42 d, pigs fed AOX tended to have 2.5% higher ADG (492 vs 480 ± 4 ; $P < 0.06$) and 2.5% higher ADFI (770 vs 751 ± 6 ; $P < 0.05$) compared to controls. From 10 to 42 d, pigs fed fresh oil had higher ADG (507 ± 5) and ADFI (792 ± 8) than either pigs fed oxidized oil (ADG 480 ± 5 and ADFI 751 ± 8 ; $P < 0.05$) or pigs fed DDGS (ADG 471 ± 5 and ADFI 739 ± 8 ; $P < 0.05$). Day 42 ending bodyweights tended to be heavier for pigs fed AOX (23.87 vs 23.50 ± 0.14 , $P < 0.07$). Pigs fed fresh oil had 4.8% heavier ending bodyweights than pigs fed DDGS (24.35 vs 23.18 ± 0.17 , $P < 0.01$) and 3.5% heavier ending bodyweights than pigs fed oxidized oil (24.35 vs 23.52 ± 0.17). No differences were detected in GF between fat sources ($P > 0.88$) or AOX ($P > 0.82$). There were no significant interactions detected between AOX and fat source on pig performance ($P > 0.26$). In summary, pigs fed DDGS had similar performance as pigs fed oxidized oil and both sources were lower in performance than pigs fed fresh corn oil. Dietary addition of AOX improved pig growth performance regardless of fat source.

Key Words: swine, antioxidant, DDGS

181 Effects of meal or pellet diet form on finishing pig performance and carcass characteristics. M. L. Potter, S. S. Dritz, M. D. Tokach, J. M. DeRouchey, R. D. Goodband, J. L. Nelssen, and J. A. Barnes*, *Kansas State University, Manhattan.*

The effects of feeding diets in meal or pellet form on finishing pig performance were determined in 2 experiments. Within each experiment's diet formulation (corn-soybean meal-based diets in Exp. 1 and diets with alternative ingredients in Exp. 2) and particle size were identical between treatments. In Exp. 1, 1,072 pigs (27.5 kg) were used in a 112-d trial. Treatments were arranged in a 2×2 factorial (10 pens per treatment) with main effects of diet form and gender. Pelleted diets were analyzed and contained 25% fines with a pellet durability index of 87%. There were no gender \times diet form interactions for overall ADG, ADFI, or G:F. Pigs fed pelleted diets had increased ADG (0.92 ± 0.005 vs. 0.87 kg, $P < 0.01$) compared with pigs fed meal diets. There was no difference ($P = 0.69$) in ADFI, but pigs fed pelleted diets had a 5.4% improvement (0.37 ± 0.002 vs. 0.35 , $P < 0.01$) in G:F compared with pigs fed meal diets. Pigs fed pellets were 6.2 kg heavier ($P < 0.01$) at off test and had heavier (97.3 ± 0.60 vs. 92.2 kg, $P < 0.01$)

carcasses than pigs fed meal diets. Backfat depth was unaffected ($P = 0.19$) by diet form, but pigs fed pelleted diets tended to have lower percentage lean (52.8 ± 0.13 vs. 53.2% , $P = 0.07$) and loin depth (61.0 ± 0.35 vs. 62.0 mm, $P = 0.09$) than pigs fed meal diets. In Exp. 2, 1,214 pigs (26.4 kg) in barrow or gilt pens were used in a 42-d trial (11 pens per treatment). Pelleted diets were analyzed and contained 35% fines with a pellet durability index of 80%. Pigs fed pelleted diets had greater (0.93 ± 0.034 vs. 0.89 kg, $P < 0.01$) ADG than pigs fed meal diets. There were no differences ($P \geq 0.13$) in overall ADFI or G:F between pigs fed meal and pelleted diets. While not significant ($P = 0.14$), pigs fed pelleted diets had a numerical BW advantage of 1.9 kg on d 42 compared with pigs fed meal diets. Although feeding a pelleted diet improved ADG compared with feeding a meal diet, the magnitude of the response was inconsistent between trials. Diet formulation did affect pellet quality, which may explain differences between the experiments.

Key Words: growth, pellet, pig

182 Processing conditions affect nutrient digestibility of cold-pressed canola cake for grower pigs. R. W. Seneviratne¹, E. Beltranena^{1,2}, L. A. Goonewardene^{1,2}, R. W. Newkirk³, and R. T. Zijlstra^{*1}, ¹University of Alberta, Edmonton, AB, Canada, ²Alberta Agriculture and Rural Development, Edmonton, AB, Canada, ³Canadian International Grains Institute, Winnipeg, MB, Canada.

Cold-pressed canola cake contains more residual oil than expeller-pressed and solvent-extracted canola meal; however, the nutritional quality is poorly defined. Canola seed was pressed with a non-heated or heated barrel at slow or fast screw speed in a 2×2 factorial arrangement. Seven ileal-cannulated barrows (26 kg BW) were fed at $2.8 \times$ maintenance diets containing 44% of 1 of 4 canola cake samples, expeller-pressed canola meal, canola seed, or a N-free diet in a 7×7 Latin square to measure energy and AA digestibility and calculate standardized ileal digestible (SID) AA and NE content. In 9-d periods involving a 5-d adaptation, and a 2-d feces and 2-d digesta collection, 7 observations per diet were obtained. Cold-pressed canola cake contained 41% CP, 16% ether extract, and 7 $\mu\text{mol/g}$ total glucosinolates (DM basis). Both AID and total tract digestibility of energy in cold-pressed canola cake was 36% higher ($P < 0.05$) in heated vs. non-heated conditions, and 8% higher ($P < 0.05$) in fast vs. slow screw speed, without interaction, indicating that added heat enhances energy digestibility. The AID of energy in canola cake was 13 and 118% higher ($P < 0.05$) than expeller-pressed canola meal and canola seed, respectively. Heat and speed interacted ($P < 0.05$) for SID of AA, but effects were not consistent among AA. The DE and NE content of cold-pressed canola cake was 0.73 and 0.52 Mcal/kg of DM higher ($P < 0.05$), respectively, than expeller-pressed canola meal, and did not differ from canola seed. On average, cold-pressed canola cake contained 4.17 Mcal/kg DE, 2.84 Mcal/kg NE, 0.87% SID Lys, 0.46% SID Met, and 0.79% SID Thr (DM basis). In conclusion, processing conditions greatly affected the digestible nutrient content of cold-pressed canola cake; content of ether extract was an important determinant of the energy value.

Key Words: canola co-product, nutritional value, pig