

114 Comparison of yellow dent and NutriDense corn hybrids for nursery pig diets. C.W. Hastad*, M.D. Tokach, J.L. Nelssen, R.D. Goodband, S.S. Dritz, and C.M. Peter¹, *Kansas State University, Manhattan Kansas*, ¹*Exseed Genetics L.L.C. Owensboro, Kentucky*.

A total of 315 nursery pigs (BW = 15.2 kg) were used in a 21-d growth assay to determine the relative energy value of both NutriDense (ND) and NutriDense Low Phytate (NDLP) corn compared to normal yellow dent (YD) corn. The ND is a high-protein, high-oil variety; and NDLP is a high-protein, high-oil, low-phytate variety. Pigs were weighed and allotted to one of nine treatments with five pigs per pen and seven pens per treatment. Dietary treatments were arranged in a 3×3 factorial design, with corn source representing one factor (YD, ND, and NDLP) and supplemental fat level representing the other factor (0, 3, or 6%). No corn source × fat level interactions ($P > 0.10$) were observed for any of the performance criteria. Performance values for YD, ND, and NDLP were 750, 734, and 738 g/d for ADG and 0.645, 0.661, and 0.656 for gain/feed (G/F), respectively. No differences ($P > 0.11$) in ADG were observed among corn sources. Feeding pigs diets containing either ND or NDLP corn, however, reduced ADFI ($P < 0.02$) and improved G/F ($P < 0.05$) compared to those fed YD corn. Increasing dietary fat levels produced linear improvements in both ADG (726, 748, and 748 g/d; $P < 0.04$) and G/F (0.625, 0.656, and 0.681; $P < 0.001$), and reduced ADFI ($P < 0.01$). These data indicate the ME values for ND and NDLP corn are 5 and 3% higher, respectively, than for YD corn. These data are in agreement with the data of Peter et al. (2001; JAS 79: suppl. 2; abstract 236) wherein ND and NDLP corns were reported to contain 6.5 and 4% more ME, respectively, than YD corn, and the ME content of NDLP is 2% lower than that of ND corn. The lack of interaction between corn source and fat level also indicates that higher energy diets can be achieved through the use of ND or NDLP corn and fat to achieve further improvements in feed efficiency.

Key Words: Pigs, Corn Hybrids, Metabolizable Energy

115 Effect of pellet hardness on growth performance of weaned pigs. I. Mavromichalis*¹, D. R. Cook², M. M. Ward², and N. D. Paton², ¹*SCA Nutrition USA, Marion IA*, ²*Akey, Inc., Lewisburg OH*.

Pellet hardness is closely associated with pellet durability, a desirable trait in nursery diets. Field observations, however, suggest weaned pigs exhibit an aversion to hard pellets by reducing consumption. We conducted two experiments to determine the effects of pellet hardness on growth performance during the postweaning period. In Exp. 1, 440 weaned pigs (5.4 kg; 18 d), in 10 replicates, were used to determine the effects of soft vs hard pellets on growth performance during an 11-d period. Pellet hardness was manipulated by replacing raw starch (soft) with gelatinized starch (hard). Diets were conditioned for 30 s at 59°C before pelleting (2.4 mm). Starch processing did not affect dietary energy use, as evidenced by comparable feed efficiency between treatments. Feed intake (-13%) and weight gain (-11%), however, were markedly reduced ($P < 0.02$) by increased pellet hardness. In Exp. 2, 880 weaned pigs (4.9 kg; 18 d), in 10 replicates, were used to determine the effects of increasing pellet hardness on growth performance during a 14-d period. Pellet hardness was progressively increased by replacing 0, 33, 66, and 100% of the raw starch (25%) in the basal diet with gelatinized starch. Pellet durability index was 67, 93, 92, and 97% for the four experimental diets. Feed manufacturing was as in Exp. 1. In agreement with Exp. 1, feed efficiency was not affected by pellet hardness, indicating that pellet quality and not starch processing was responsible for differences in growth performance. Indeed, feed intake ($P < 0.09$) decreased slightly (218, 214, 209, 197 g/d) in a linear pattern with increasing pellet hardness, whereas numerical differences in weight gain (203, 197, 192, and 181 g/d) were not significant. In conclusion, it appears increasing pellet hardness in diets for young pigs reduces feed intake during the first two weeks postweaning.

Key Words: Nursery Pigs, Pellet Hardness, Pellet Quality

116 Effects of soybean meal particle size on growth performance of nursery pigs. K. R. Lawrence, C. W. Hastad, R. D. Goodband, M. D. Tokach, J. L. Nelssen, S. S. Dritz, and M. J. Webster, *Kansas State University, Manhattan, KS*.

The objective of this study was to evaluate the influence of reducing particle size of extruded-expelled soybean meal and solvent extracted soybean meal on growth performance of nursery pigs. A total of 360 pigs were used in two 21-d growth assays with six pigs per pen and ten pens per treatment. Pigs were fed the same SEW diet for 7 d after weaning, followed by a common Phase 2 diet from d 7 to 14. On d 14, all pigs were weighed and allotted to one of three dietary treatments. All diets contained 61.9% corn and 34.4% soybean meal. Diets were formulated to 1.2% total lysine, 0.78% Ca, and 0.40% available P. In Exp. 1, pigs were fed diets containing a single lot of extruded-expelled soybean meal ground to 965, 742, or 639 microns, which resulted in whole diet particle sizes of 728, 719, and 697 microns. In Exp. 2, pigs were fed a diet containing one lot of solvent extracted soybean meal ground to 1226, 797, or 444 microns, which resulted in whole diet particle sizes of 732, 681, and 629 microns, respectively. In Exp. 1, reducing particle size of extruded-expelled soybean meal had no effect ($P > 0.18$) on ADG (541, 537, and 540 g/d) and feed efficiency (G:F: .61, .61, .63) for pigs fed diets containing 965, 742, and 639 micron extruded-expelled soybean meal, respectively. In Exp. 2, reducing particle size of solvent extracted soybean meal had no effect ($P > 0.61$) on ADG (483, 487, 481g/d) and G:F (0.66, 0.66, 0.65) for pigs fed diets containing 1226, 797, or 444 micron solvent extracted soybean meal, respectively. These results suggest that soybean meal particle size ranging from 1226 to 440 microns does not affect nursery pig growth performance.

Key Words: Pigs, Particle Size, Soybean Meal

117 Impact of stocking density/group size on the response to changes in dietary energy content by weanling pigs from 25 to 53 days of age. C.L. Levesque^{1,2}, J.F. Patience*¹, E. Beltranena¹, and R.T. Zijlstra¹, ¹*Prairie Swine Centre Inc.*, ²*University of Saskatchewan, Saskatoon, SK, Canada*.

The primary limitation to growth in the young pig is gut capacity; however, increasing dietary digestible energy (DE) concentration did not previously result in improved pig performance to 56 d of age. The absence of response may have been due to lack of stressors, such as crowding. This experiment evaluated the interaction of dietary DE content and stocking density/group size (i.e. crowding) on weanling pig performance. A total of 600 pigs weaned at 19 d of age were assigned within 3 replicate groups to one of 10 treatments arranged in a 2 X 5 factorial with 2 stocking densities/group sizes (m^2/kg BW^{0.67}; pigs per pen): LSD (0.0471;16) or HSD (0.0314;24) and 5 dietary DE levels (Mcal/kg): VLOW (3.19); LOW (3.33); MID (3.47); HIGH (3.61) or VHIGH (3.75). Diet DE content was altered by changing the relative concentrations of low (barley) and high (wheat, canola oil) energy ingredients. Pigs received experimental diets in mash form from 25 to 53 d of age. Body weight (BW) and feed disappearance were measured weekly. At 53 d of age, pig BW (20.15 kg 0.06 SEM) was not affected by diet or stocking density ($P > 0.08$). ADFI decreased ($P < 0.05$) and feed efficiency improved ($P < 0.001$) with increasing dietary DE level. Overall, pig ADG did not improve ($P > 0.10$) with dietary DE level, regardless of crowding. Daily DE intake was higher in LSD ($P = 0.05$) versus HSD. At LSD, daily DE intake was greatest in pigs on the HIGH diet. At HSD, daily DE intake was lowest in pigs on the VLOW diet ($P < 0.05$). Pigs on VLOW and HSD were lightest at 53 d of age compared to other treatment groups ($P < 0.05$). The weanling pig was able to compensate for reduced dietary DE through increased feed intake; however, when crowded and fed very low dietary DE levels, the young pig's ability to compensate may be exceeded. In conclusion, growth limitations in the weanling pig may not be overcome simply by increasing dietary DE content.

Key Words: Digestible Energy, Pig, Stocking Density

118 Effects of sorting and penning pigs by BW vs. mixing pigs of different BW on post weaning growth performance. D. R. Cook, M. M. Ward, and N. D. Paton*, *Akey Inc. Lewisburg, OH*.

In Exp. 1, 880 pigs (18 d old; 0.25 m^2 /pig) were weighed individually and allotted to one of 5 pre-determined weight classes: A (6.97 kg), B