

**112 Replacement value of *Paul* naked oat in weanling pig starter diets.** D.G. Landblom\* and W.W. Poland, *North Dakota State University, Dickinson Research and Extension Center.*

Plant breeders at NDSU have released a new naked oat variety, (*Avena sativa* L. var. *Paul*), which appears to have potential for replacing corn and a portion of the soybean meal in starter diets for weanling pigs. This substitution would be advantageous for producers in the extreme Northern Great Plains where corn and soybean are not commonly grown. Weanling pigs (128 hd, PIC L326 × C-15; Init. BW = 6.36 kg) were weaned, moved to a segregated early-weaning (SEW) facility and presented the following meal-type, 3-phase starter diets: corn-soybean meal control (0%-NO), 50% naked oat (50%-NO), 75% naked oat (75%-NO) and 100% naked oat (100%-NO). Barrows and gilts were balanced across dietary treatments, and pen served as the experimental unit (8 pigs/pen; 4 pens/treatment). Pig performance was monitored over a 29d starter period. Numerical differences for average daily gain (ADG), average daily feed intake (ADFI) and gain:feed (G:F) existed in phase-1 post-weaning (9d), and subsequently in phase-2 (13d), but none were significant ( $P > .05$ ). In phase-3 (7d), pigs fed 50%-NO tended to consume more feed than the other treatments ( $P = .06$ ), but ADG was only numerically slower. Except for the depression observed with 50%-NO in phase-3, the levels and grain bases evaluated supported a smooth transition from nursing to the nutrient-dense nursery diets. Over the entire 29d starter period, numerically slower ADG and nearly equal ADFI, for the 50%-NO treatment, translated into the lowest G:F ratio ( $P = .035$ ) and the highest feed cost/pound of gain ( $P = .05$ ). When 29-day performance for the 0%-NO, 75%-NO and 100%-NO was evaluated, only small numerical differences for ADG, ADFI, G:F and feed cost/pound of gain were observed. The data, with respect to replacing one-half of the corn with naked oat, is inconclusive. However, based on growth and economic performance, corn and a portion of the soybean meal in SEW pig starter diets can be completely replaced with *Paul* oat.

**Key Words:** Pigs, Paul Oat, Starter Diet

**113 Effect of carbohydrate source in phase I and phase II starter diets.** I. B. Kim\*, and G. L. Allée, *University of Missouri, Columbia.*

Previous research in our laboratory has demonstrated the importance of lactose in phase I and phase II starter diets. Two experiments were conducted to evaluate the use of a carbohydrate by-product as a replacement for lactose. In Exp. 1, 120 weaned pigs (13-16 d and 5.6 kg) were allotted in a randomized complete block design (RCBD) to 10 replications with four pigs per pen. This experiment evaluated three carbohydrate sources (lactose, carbohydrate by-product, and 50-50 blend of lactose and the carbohydrate by-product). The carbohydrate sources were added at 26% in the phase I diets and 15% in the phase II diets. Phase I diets contained 7.5% plasma protein. The phase I diets were fed from d 0 to 14 and the phase II diets from d 14 to 28. There were no significant differences between carbohydrate sources on pig performance in phase I. However, during phase II pigs fed the diet with lactose had an improved G/F ( $P = .06$ ) compared to pigs with total replacement of lactose with the carbohydrate by-product. For the entire 28 d trial ADG, ADFI and G/F were similar for the 50-50 blend and those fed lactose. Total replacement of lactose with the carbohydrate by-product resulted in a reduced G/F ( $P = .09$ ). Exp. 2 used 100 weaned pigs (15 - 19 d and 4.75 kg) in a RCBD with five replications with five pigs per pen. This experiment evaluated four carbohydrate treatments (lactose, carbohydrate by-product, 50-50 blend, and corn). All phase I diets contained 3.5% plasma with the carbohydrate sources included at 15%, and were fed d 0 to 14. The phase II diets contained 7.5% of the carbohydrate sources and were fed d 14 to 28. A common phase III diet was fed d 28 to 42. During all phases pigs fed corn tended to have a lower ADG than pigs fed the other carbohydrate sources with the 50-50 blend resulting in the highest ADG. The results of both experiments suggest that this carbohydrate by-product can replace at least 50% of the lactose in phase I and phase II starter diets.

**Key Words:** Weaned pig, Lactose, Carbohydrate source

**114 Potato chip scrap as a source of energy in the diet of nursery pigs.** S. Rahnema\*, M. A. Barieklow, R. H. Ellis, and T. Meek, *Ohio State University Agricultural Technical Institute, Wooster.*

Seventy-two pigs (avg wt 12.24 kg) were used in an experiment to determine the effect of feeding scrap potato chips as a source of energy in the diet of nursery pigs. Pigs were blocked by sex and weight and randomly assigned to three treatments in a randomized complete block design experiment. Each treatment consisted of two pens, each holding 12 pigs. In treatment one (control), 24 pigs were fed ad libitum a diet consisting of soybean meal and corn supplemented to meet NRC requirements. In treatments two and three, 9.90% and 19.85% of the corn were replaced with 8.95% and 19.90% of scrapped potato chips, respectively. After 10 d of adaptation to the diets and the pens, a performance trial (14 d) was conducted to measure feed intake (FI), total gain (TG), average daily gain (ADG), and gain to feed ratio (G/F) for these pigs over a 14-day period. Individual pig weights and pen feed consumption were determined on a weekly basis. The GE of the control diet (15.93 kJ/kg) was increased to 16.74 kJ/kg and 17.28 kJ/kg when 8.95% and 19.90% potato chips were added in the diet, respectively. Total gain and ADG were numerically higher ( $P > .05$ ) and FI was numerically lower ( $P > .05$ ) for pigs fed 8.95% and 19.90% potato chips vs the control diet. However, these insignificant ( $P > .05$ ) increases in ADG and TG and the decrease ( $P > .05$ ) in FI resulted in an increase in G/F for pigs receiving 8.95% ( $P < .05$ ) and 19.90% ( $P < .01$ ) potato chips, respectively, over the control group. This experiment demonstrates that potato chip scrap can be an effective substitute for corn in the diet of nursery pigs.

**Key Words:** Nursery Pigs, Potato Chips

**115 Evaluation of an experimental potato protein on starter pig performance.** C. A. Kerr\*, R. D. Goodband, M. D. Tokach, J. L. Nelssen, J. R. Bergstrom, W. B. Nessmith, and R. E. Musser, *Kansas State University, Manhattan.*

Three experiments were conducted to evaluate an experimental potato protein (EPP; 15.6 mg/100g total glycoalkaloids) on nursery pig growth performance. In Exp. 1, 180 weanling pigs (5.9 kg and 20 d of age) were fed a control diet containing 20% dried whey, 4% fish meal and 7% spray-dried animal plasma (AP; 1.5% total and 1.26% digestible lysine). Additional dietary treatments consisted of EPP (5.18% digestible lysine) replacing the 25, 50, 75, or 100% of the digestible lysine provided by AP (5.92% digestible lysine). From d 0 to 14, ADG tended to increase (quadratic  $P < .11$ ) with increasing EPP (290, 349, 322, 336, and 331g/d, respectively). Feed efficiency (G/F) increased (linear  $P < .05$ ) with increasing EPP (.83, .89, .92, .89, and .97, respectively). In Exp. 2, 210 weanling pigs (5.5 kg and 20 d of age) were fed a control diet containing 20% dried whey, 17.5% dried skim milk and 4% fish meal (1.46% total and 1.26% digestible lysine). Additional diets consisted of 3.5 and 7% AP or 4 and 8% EPP and lactose replacing the digestible lysine provided by dried skim milk. From d 0 to 7, increasing AP increased (linear,  $P < .05$ ) ADG (286, 304, 331 g/d, respectively). However, ADG increased then decreased (quadratic  $P < .10$ ) with increasing EPP (286, 295, 240 g/d, respectively). From d 0 to 14, increasing AP had no effect on ADG (377, 367, and 377 g/d, respectively) but ADG tended to increase then decrease (quadratic  $P < .10$ ) with increasing EPP (377, 390, 349, respectively). In Exp. 3, 255 weanling pigs (5.3 kg and 17 d of age) were fed a common diet from d 0 to 7, then fed diets containing either 2.5% spray-dried blood meal, 5.51% select menhaden fish meal, 4.17% conventional (303 mg/100g total glycoalkaloids) or EPP from d 7 to 28. No differences were observed in growth performance; however, pigs fed EPP had numerically greater ADG and G/F than those fed conventional potato protein. These results suggest that EPP can be a replacement for a portion of the AP in diets for early-weaned pigs.

**Key Words:** Pigs, Potato protein, Animal plasma