A total of 108 weaning pigs (initially 5.3 kg and 21 d of age) was used in a 35 d growth assay to compare various carbohydrate sources. Pigs were allotted by weight and age to ten pens and six pigs per treatment. The carbohydrate sources compared were corn, edible-grade oat flour, two modified potato starches, and lactose. Potato starch 1 was a spray-dried glucose syrup with a degree of polymerization of 1,8%, and potato starch 2 contained maltodextrin and has a degree of polymerization of 6/100. The various carbohydrate sources were substituted on an equal lysine basis using a combination of casein and L-lysine HCL. Soybean meal diet was held constant in all diets. The five carbohydrate inclusion levels were as follows: 1) 36.5% ground corn (Corn), 2) 36.5% edible grade oat flour (Oat), 3) 12% modified potato starch 1 and 23.9% ground corn (PS 1), 4) 12% modified potato starch 2 and 23.9% ground corn (PS 2), and 5) 12% lactose and 23.9% ground corn (Lactose). All phase 1 diets (d 0 to 14 phase) were fed for 14 d to examine the growth performance of the initial pigs. The phase 2 diets contained 7.5% spray-dried porcine plasma, 1.75% spray-dried blood meal, and 25% dired whey. All pigs were fed the same phase 1 diet (d 14 to 35 phase) formulated to contain 1.25% lysine. For d 0 to 14 phase weaning, pigs consuming Pol 1 diet had higher (P<.05) ADG and ADFI than pigs consuming the corn or oat flour diets and numerically higher ADG and ADFI than pigs fed the other two diets. Currently, the hypoglycemic nature of modified potato starches prohibits regular application in starter pig diets. However, no differences in growth performance. Thus, economics indicate no additional need of lactose in addition to starch (edible grade whey) in the phase 1 diet. There were no differences in performance among the phase 1 diets. The results in phase 1 from the experiment between the pigs consuming the corn or oat flour diets. In conclusion, oat flour does not appear to be a superior carbohydrate source than corn in the phase 1 nursery diet.

**Key Words** Starter pig, carbohydrate, growth performance.

### **Spray-dried porcine plasma in diets for early-weaned pigs housed either in an experimental or conventional nursery setting.**

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Three 28-d experiments were conducted to evaluate the effects of substituting porcine plasma (PP; American Protein Corp., Ames, IA) for dried skim milk (DSM) in diets for early-weaned pigs housed either in an environmental chamber in newly purchased pens (Pens 1 and 2) or a commercial-type nursery (dirty environment; DRT ENV). In all experiments, a corn-soy-20% DSM-20% dried whey (DW) control diet (.80% met+cys) was fed from 0 to 14 d; from 15-28 d, all pigs received a corn-soy diet with 10% DDW. PP substitutions for DSM in the control diet were on a lysine basis, and lactose was added to these diets. In Exp. 1, 80 pigs (17±1 d age; 5.5 kg BW) housed in the CLN ENV were allowed to choose the following treatments: (1) control diet (1.50% lys, 87% Na), or (2) 3%, 6%, 9%, or (3) 12% PP. Daily gain (ADG), daily feed gain (ADFI), and feed gain/food gain (F/G) were, respectively: 310, 313, 287, 289, 268 g; 479, 488, 512, 532, 500 g; 1.60, 1.57, 1.79, 1.85, 1.87 for 0-14 d, and 405, 420, 407, 403, 397 g; 740, 702, 723, 719, 689 g; 1.83, 1.87, 1.78, 1.78, 1.76 for the entire trial (0-28 d).

ADG and ADFI were not different for pigs fed DSM or PP from 0-14 d or 0-28 d. However, F/G from 0-14 d was poorer (P<.02) for pigs receiving PP than those fed DSM, and F/G increased linearly (P<.001) as the level of PP increased. In Exp. 2 and 3, 160 pigs (18±2 d age; 5.2 kg BW were fed (1) control diet (1.40% lys, .68% Na) or (2) diet containing 8.3% PP in the CLN ENV, or these two diets (3, 4) in the DRT ENV. Pooled ADG, ADFI, and F/G were, respectively: 283, 300, 203, 269 g; 411, 483, 260, 376 g; 1.46, 1.46, 1.32, 1.41 for 0-14 d, and 428, 423, 264, 334 g; 675, 701, 461, 549 g; 1.58, 1.65, 1.63, 1.67 for 0-28 d. From 0-14 and 0-28 d, pigs in the CLN ENV had higher (P<.05) ADG than those in the DRT ENV, but F/G from 0-14 d was poorer (P<.001) for pigs in the CLN ENV. In the DRT ENV, pigs consuming PP had greater (P<.03) ADG and ADFI than pigs fed DSM from 0-14 d and 0-28 d. Pigs fed PP in the CLN ENV ate more feed (P<.001) and were less efficient (P<.001) from 0-14 d than those fed DSM. From these results, early-weaned pigs housed in a conventional nursery respond more favorably to PP than those reared in a cleaner nursery.

**Key Words:** Early-Weaned Pigs, Porcine Plasma, Environment.

### **Optimum level of spray-dried porcine plasma for early-weaned (18.5 d of age) starter pigs.**


A total of 290 early-weaned pigs (initially 3.4 kg and 10.5 d of age) was used to evaluate various dietary levels of spray-dried porcine plasma. Pigs were allotted to six pens with six pigs per pen, 10 pigs per 10 experimental diets with spray-dried porcine plasma (5, 7.5, 10, 12.5, 15% and lactose replacing dried skim milk on a lysine and lactose basis. Diets were formulated to have 1.25% lysine. Three pigs per pen were selected random, fishmeal, and 25% dried whey. Soybean meal diet was held constant at 11% of all diets. Pigs were fed these diets from d 0 to 14 postweaning. Common diets were fed from d 14 to 42 postweaning. In order to monitor growth to 14 postweaning. The common diet fed from d 14 to 25 postweaning contained 1.25% lysine, 2.5% spray-dried porcine plasma, 2.5% spray-dried blood meal, and 25% dried whey. From d 25 to 32 postweaning, the common diet contained 1.25% lysine, 2.5% spray-dried porcine plasma, and 10% dried whey. All pigs were then switched to a common corn-soybean meal diet formulated to contain 3.5% lysine. During the first phase (d 0 to 14 postweaning), linear improvements in ADG (P<.001) and ADFI (P<.01) were observed as the level of spray-dried porcine plasma increased. This resulted in a linear (P<.001) increase in pig weight on d 14 postweaning. For the first phase, there were no significant differences in feed efficiency (G:F). From d 14 to 25 postweaning, there were no differences in ADG and ADFI at the level of spray-dried porcine plasma increased. However, this reversal of performance resulted in no difference in pig weights at d 25. From d 25 to 42 postweaning, there was a quadratic effect (P<.04) in ADG. In summary, increasing the level of spray-dried porcine plasma resulted in increased ADG and ADFI from d 0 to 14 postweaning; however, the impact on subsequent performance needs to be investigated further.

**Key Words:** Starter pig, spray-dried porcine plasma, skim milk.

### **Effects of wheat gluten and plasma protein on growth performance and digestibility of nutrients in nursery pigs.**

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As experiment was conducted to determine the nutritional value of spray-dried wheat gluten and plasma protein in diets for weaning pigs. For the experiment, 120 pigs (6.4 kg avg initial BW) were used in a 35-d growth assay. Phase I treatments (fed from d 0 to 14 postweaning) were: 1) dried wheat gluten (WG), 2) dried plasma protein (PP), and 3) control (no DDW). All diets were formulated to contain 1.4% lysine, 9.5% Ca, and 8.5% P. For Phase 2 (d 14 to 35), all pigs were fed the same corn-soybean meal-based diet (1.25% lysine, 9.5% Ca, and 8.5% P) (Contrasts based on Phase I treatments) were: 1) DSM vs the other treatments; 2) WG and SDPP vs WG and SDPP blend; and 3) WG and SDPP vs no DDW. All pigs had 1.25% lysine and 9.5% Ca. Gross whole body growth (P<.03) and ADHI (P<.04) compared to pigs fed WG. However, for d 14 to 21 (i.e., during the transition period to the Phase 2 diet), pigs fed with WG during Phase 1 had greater ADG and ADFI (P<.02) compared to pigs fed no DDW. Over the initial postweaning phase; however, feeding WG during Phase 1 resulted in improved growth performance during the transition to Phase 2 diet.

**Key Words:** Wheat Gluten, Plasma Protein, Pig.