

on growth performance of nursery pigs. Pigs had an initial BW of 4.9 kg in Exp. 1 and 5.1 kg in Exp. 2. There were eight pigs/pen in both experiments with five pens/treatment in Exp. 1 and six pens/treatment in Exp. 2. Pigs were blocked by weight and allotted to one of ten dietary treatments. Both experiments contained similar treatments that first included a control diet that contained ingredients that were not irradiated. Other treatments included diets that had specific ingredients irradiated: corn, soybean meal, spray-dried whey, spray-dried animal plasma, fishmeal, soybean oil, or all microingredients combined (antibiotic, vitamins, minerals, crystalline amino acids). The final two treatments included a diet that contained all ingredients that had been irradiated and a diet that was manufactured with nonirradiated ingredients and subsequently irradiated. An average irradiation dose of 8.5 kGy was used. No experiment \times treatment interactions were observed. Overall (d 0 to 14 in trial 1 and d 0 to 12 in trial 2), pigs fed diets containing irradiated spray-dried animal plasma or soybean meal had increased ($P < 0.05$) ADG compared to the control diet with no irradiated ingredients and the complete diet that was irradiated. Also, ADFI ($P < 0.05$) was greater for pigs consuming the diet with irradiated soybean meal compared to those fed the irradiated whole diet. Finally, pigs fed irradiated spray-dried animal plasma had improved gain/feed ($P < 0.05$) compared to those fed diets containing irradiated microingredients or if all ingredients had been irradiated before manufacturing. In summary, irradiation of certain feed ingredients (spray-dried animal plasma or soybean meal in these experiments) can improve growth performance in nursery pigs, whereas irradiation of all ingredients or the whole diet does not enhance performance.

Key Words: Nursery Pig, Feed Ingredients, Irradiation

144 Comparison of irradiated feed and food grade spray-dried animal plasma on nursery pig performance. J.M. DeRouchey*, M.D. Tokach, J.L. Nelssen, R.D. Goodband, S.S. Dritz, J.C. Woodworth, and C.W. Hastad, *Kansas State University, Manhattan.*

A total of 535 weaning pigs (17 ± 2 d of age) were used (initial BW of 6.3 kg in Exp. 1 and 6.1 kg in Exp. 2) to determine the effects of initial bacterial concentrations of spray-dried animal plasma on growth performance. Previous research indicates that pigs fed irradiated feed-grade animal plasma (initially high bacteria) have improved growth performance compared to those fed non-irradiated feed-grade animal plasma. Therefore, we hypothesized that irradiation of food grade plasma (initially low bacteria) may lead to a lower growth performance response. All pigs were blocked by weight with five pigs per pen and six and seven pens/treatment in Exp. 1 and 2, respectively. In Exp. 1, pigs were allotted to one of nine treatments including a control diet or the control with 5% plasma from one of four different sources either fed irradiated or as-is. Plasma sources were from American Protein Corporation, Ames, IA (feed grade, AP 920 and AP 820; and food grade, source 1 and 2). In Exp. 2, five diets were used from Exp. 1, which included the control, and plasma sources, AP 820 and food grade, fed irradiated or as-is. Pigs fed animal plasma had increased ADG (Exp. 1 & 2), ADFI (Exp. 1) and G:F (Exp. 2; $P < 0.05$) compared to pigs fed the control diet. In Exp. 1, pigs fed irradiated AP 920 feed grade plasma had increased ADG ($P < 0.05$) compared to those fed the control diet. Also, pigs fed irradiated AP 920, regular AP 820, regular and irradiated source 1 food grade and regular source 2 food grade had improved ADFI compared to pigs fed the control diet. In Exp. 2, pigs fed irradiated AP 820 had increased ADG ($P < 0.05$) compared to those fed the control diet and pigs fed regular AP 820. Irradiation of food grade plasma did not influence ($P > 0.12$) pig performance in either experiment. These studies indicate that reducing initial bacterial levels in animal plasma leads to increased growth of nursery pigs, and may explain the variation in response when animal plasma is included in diets for nursery pigs.

Key Words: Nursery Pig, Animal Plasma, Irradiation

145 The effect of varying levels of spray-dried animal plasma in nursery pig diets. C. S. Stovall*, G. A. Apgar, and K. E. Griswold, *Southern Illinois University, Carbondale.*

A total of 193 crossbred weaning pigs (avg 24 ± 0.5 d and 6.5 ± 1.5 kg in Trial 1, and 19 ± 0.7 d and 5.6 ± 0.9 kg in Trial 2) were used in two trials to determine the effect of adding varying levels of spray-dried animal plasma (SDAP) to phase one nursery diets. Pigs were blocked by initial

weight, sex and litter, and were randomly assigned to one of four treatment diets. Pigs were housed in an environmentally controlled modular nursery with 12 pens and an average of 12 pigs per pen (Trial 1) and 7 pigs per pen (Trial 2). Pigs were allowed ad-libitum access to feed and water for the duration of each trial. All diets met or exceeded current nutrient requirement estimates (NRC, 1998). Lysine levels were equalized across dietary treatments by substitution with blood meal. Choice white grease was added when needed to make the diets isocaloric. The dietary treatments were as follows: 1) 0% SDAP (control), 2) 3% SDAP, 3) 6% SDAP, 4) 9% SDAP. Pigs were weighed, feed intake and feed efficiency calculated weekly. The treatment diets were fed from d 0-14 post-weaning after which a common corn-soybean meal diet was fed to all pigs d 14-35 post-weaning. Data from the two trials were analyzed using the GLM procedure of SAS and orthogonal contrasts were used to estimate linear, quadratic and cubic treatment effects and individual means were separated by the LSD procedure. In Trial 1, there were no significant effects of SDAP addition on ADG or ADFI. Feed efficiency was affected in a quadratic manner ($P < .05$) during wk 3, 5 and 3 through 5 with pigs fed 0 and 9% SDAP having numerically similar G:F and pigs fed 3% and 6% SDAP having numerically lower efficiencies. In Trial 2, ADG and ADFI were improved linearly ($P < .05$) during wk 1, and ADFI was improved linearly ($P < .05$) during wk 4. Efficiency of gain was improved in a linear manner ($P < .05$) during wk 1, 1 through 2 and 1 through 5. These data suggest that SDAP addition improves performance of pigs weaned at 19 days of age as compared with pigs weaned at 24 days of age.

Key Words: Spray-Dried Animal Plasma, Weaning Pig, Performance

146 A comparison of roller-dried whey and spray-dried whey in swine starter diets. G. F. Yi*¹, G. L. Allee¹, A. M. Gaines¹, D. C. Kendall¹, K. M. Halpin², and M. Trotter², ¹*University of Missouri-Columbia*, ²*International Ingredient Corporation, Inc.*

A total of 200 weaned barrows and gilts (5.360.3kg, 100 each) at 19 2 days of age were used to compare the effects of roller-dried whey (RDW) and extra grade spray-dried whey (SDW) on the growth performance of young pigs. The pigs were randomly allotted by initial BW and sex to five dietary treatments in a RCBD, with ten replicate pens per trt and four pigs per pen. During day 0 14, 14 28 and 28 42, the pigs were fed Phase I, Phase II and Phase III diets respectively. During Phase I, a corn-soy diet without any whey product served as a control (Trt A). Treatments B to E contained 10%SDW, 10%RDW, or 20%SDW or 20%RDW respectively. In Phase II treatments B to E contained 5%SDW, 5%RDW, or 10%SDW or 10%RDW respectively with a corn-soy diet without any whey as the control (Trt A). In Phase III, all the pigs were fed the common diet. Pigs were weighed and feed intake recorded on d 7, 14, 28, and 42. BW, ADG, ADFI and G:F were used to evaluate growth performance. In the first week, ADFI and ADG were increased by whey addition, with the 20% whey diets, resulting in a greater response than that of 10% whey ($P < 0.05$). There were no differences due to whey source (RDW vs. SDW) ($P > 0.05$). During Phase I, compared to the control, the ADFI was linearly increased with the increasing level of either RDW or SDW ($P < 0.05$). In Phase II, there were no differences in growth performance ($P > 0.05$). However, in Phase III, pigs fed 10% or 20% whey in Phase I tended to gain faster ($P < 0.10$) with an improved feed efficiency ($P < 0.05$) compared to the pigs fed the control diet. Overall, pigs fed 20% whey in Phase I diets were approximately 1.0 kg heavier after the 42 d nursery period compared to the pigs fed the control diet. These results indicate that both RDW and extra grade SDW improved the growth performance of weaned pig with no differences between whey processing methods.

Key Words: Weaned pigs, Whey, Starter diets

147 Non-pasturized, spray-dried egg treated with Termin-8 as a protein source for phase 1 nursery diets. M.E. Davis*¹, C.V. Maxwell¹, Z.B. Johnson¹, D.C. Brown¹, S. Singh¹, K.J. Touchette², and J.A. Coalson², ¹*University of Arkansas, Fayetteville*, ²*Merrick's Inc., Union Center, WI.*

A conventional nursery trial with 144 crossbred weaning pigs was conducted to determine the efficacy of non-pasteurized, spray-dried egg product (EGG) with and without treatment with Termin-8 (a formaldehyde-based antimicrobial preservative; T-8) to replace spray-dried plasma (SDP) in the Phase 1 (d 0 to 14) nursery diet. Pigs (21 ± 1 d of age; 6.6 kg BW) were assigned by initial weight and sex to 1