Based on results, the quality of bone produced by rapidly growing pigs was the same as bones from animals that were restricted-fed; however, these results were confounded with animal age.

Key Words: Bone, Diet Restriction, Mechanical Properties

139 Effectiveness of Tylan or a direct fed microbial to reduce pig variation. C.A. Elmore*, G.A. Aggar, and K.E. Griswold, Southern Illinois University, Carbondale.

One hundred and eight pigs (crossbred sow x PIC 337) were used to evaluate the effect of an antimicrobial (Tylan) or a direct fed microbial (B. coagulans) to pig to pig variation during finishing. Pigs were weighed and allotted to outcome groups based on sex (approximately 4 females and 5 males per pen), weight and genetic background, and were randomly assigned to one of three dietary treatments. Treatments were as follows: 1) control, 2) Control + Tylan (40 g/ton), and 3) Control + B. coagulans (9.98 x 10^11 CFU/ton). Pigs were allowed ad libitum access to feed and water at all times. All pigs were weighed and feed intake and feed efficiency calculated bi-monthly, or intermittently depending upon diet change. Data were analyzed using the GLM procedure of SAS and differences among dietary treatments were analyzed using contrast statements. There were no significant differences between dietary treatments during the first 8 d for weight, ADG or G:F. Coefficients of variation for these criteria also were not altered by dietary treatment. From d 8 to d 19, pigs fed diet 3 tended (P < .07) to be heavier, than pigs fed the control treatment, with pigs fed diet 2 falling intermediate. Average daily gain was numerically greater for pigs fed diet 3 as compared with controls. Coefficients of variation tended (P < .08) to be lower for ADG during this period for pigs fed diet 3 when compared with pigs fed the control. Pigs fed treatment 2 were intermediate. Variation in BW for pigs fed the control treatment numerically increased over time, while BW of pigs fed treatments 2 and 3 numerically decreased. Our BW for pigs fed the control treatment numerically increased over time, feeding the control. Pigs fed treatment 2 were intermediate. Variation in BW for pigs fed the control treatment numerically increased over time, while BW of pigs fed treatments 2 and 3 numerically decreased. Our initial data suggest feeding a direct-fed microbial may reduce variation in growth rate.

Key Words: Finishing, Direct Fed Microbial, Tylan


A 4-wk experiment was conducted to determine the efficiency of utilization of crystalline lysine relative to the lysine in soybean meal for growth performance and effects on plasma urea concentrations in nursery pigs. Pigs were 23 to 24 d old and had an initial BW of 6 kg. Pigs were blocked by sex and weight (three blocks of barrows and three blocks of gilts) and randomly allotted to one of five dietary treatments. Pigs were individually penned in two nursery facilities and each treatment was replicated six times. The dietary treatments consisted of a basal diet (1.05% lysine) with diets containing 1.15 and 1.25% lysine that were achieved by adding lysine to the basal diet from either soybean meal (SBM) or L-lysine-HCL (CRYST). Average daily gain and ADFI were measured weekly. Blood samples were collected on the last day of the experiment and plasma was analyzed for urea concentration. Data were analyzed as a randomized complete block design with repeated measures in time. Feed efficiency (ADG/ADFI) was similar (P > 0.1) among treatments. By the 4th wk, ADG was greater (P < 0.05) for pigs fed the diet supplemented with 1.15% lysine from SBM in comparison with pigs fed the diet supplemented with 1.25% lysine from CRYST. In addition, ADFI was greater (P < 0.1) for pigs fed the 1.25% lysine supplemented from SBM vs CRYST (1.20 vs 1.06 kg). Pigs fed diets supplemented with SBM had greater (P < 0.001) plasma urea concentrations than pigs supplemented with CRYST. Although preliminary data (not shown) and lysine requirements derived from NRC (1998) support that the aforementioned lysine concentrations were within the deficient range for nursery pigs (5 to 10 kg), data from this experiment do not indicate that lysine intake was limiting growth. Therefore, conclusions regarding the efficiency of lysine utilization for growth from L-lysine-HCL and soybean meal can not be made.

Key Words: Pigs, Lysine, Growth


A 21d experiment was conducted to determine the lysine requirement for 11 to 25 kg barrows (n=252, Dalland x PIC C-22). Pigs were allotted in a randomized complete block design and were fed one of 7 dietary treatments with 9 replicates/treatment and housed at 4 pigs/pen. Dietary true ileal digestible (TID) lysine levels were 1.05, 1.13, 1.19, 1.26, 1.33, and 1.40% TID lys with all diets containing the same inclusion of soybean meal (33.1%). Dietary lysine content was increased by adding Lys-HCl (0, .09, .178, .365 and .445%, respectively). A positive control diet was formulated at 1.40% TID lys, containing .15% added Lys-HCl and 42.6% soybean meal. All diets were formulated to be equal on a ME basis (3.42 Mcal ME/kg) with additional synthetic amino acids supplied as necessary to meet minimum amino acid ratio requirements. Pigs were weighed weekly to determine average daily gain, average daily feed intake and feed efficiency. During d 0-7, there was a linear improvement in ADG and G:F (P < .05) with increasing TID lysine level, up to 1.33%. During d 7-14, there was a linear improvement in G:F (P < .05) with a plateau occurring at 1.33% TID lys. From d 14-21, a linear trend (P < .10) existed for ADG and G:F with improvements up to 1.19% TID lys. For the overall period, ADG and G:F were linearly improved (P < .05) with increasing lysine levels, up to 1.33% TID lys. The 1.40% TID lys diet did not differ from the positive control diet in any criteria measured. This experiment demonstrates that the lysine requirement for pigs from 11 to 25 kg BW may be as high as 1.33% TID lys and the inclusion Lys-HCl up to .445% does not affect performance of nursery pigs.

Key Words: Pigs, Lysine, Nursery

142 Effects of plasma grade, irradiation or formaldehyde treatment of plasma, or whole diet irradiation on growth performance of weaned pigs. D. R. Cook*, M. M. Ward, and N. D. Paton, Akey Inc. Lewisburg, OH.

Two experiments were conducted to determine the impact of reducing colony-forming units (CFU) in plasma or whole diet on weaned pig growth performance. In Exp. 1 (1760 18-d old pigs, 5.4 kg, 22 pigs/pen, 0.25 m²/pig), two sources of plasma (human grade, HGP, and technical grade, TGP), and three processes (non-processed, NP; irradiated, IR; or Termin-8, T8) were tested in a 2 x 3 factorial arrangement of treatments. Plasma sources were added to diets on an equal protein basis at approximately 5% and 2% of the diet from 0-7 and 8-14 d post weaning, respectively. Irradiation for IR treatment was 5-20 kGy. T8 (a formaldehyde product) was atomized and added directly to the plasma at 0.3% of the T8 treatment. Pigs were blocked based on BW and sex and pens were allotted to treatment within block. TGP and HGP had pre-IR total CFU/g of 21,700 and 375, respectively. IR reduced CFU/g tended to 135 and 60 for TGP and HGP, respectively. Pigs fed TGP plasma tended to have greater ADG (P<.10) and ADFI (P<.08) versus pigs fed HGP. There were no significant performance differences (P>.10) among NP, IR or T8-fed pigs during the 14 d feeding period. No interactions were observed between plasma source and processing method. In Exp. 2, 880 pigs were reared under the same conditions as in Exp. 1. Pigs were fed NP or IR diets for 22 d followed by a common NP diet. Irradiating whole diet reduced CFU/g but also decreased growth performance 0 to 5 post-weaning (ADG 159 vs. 174 g; P<.10) and feed intake (149 vs. 165 g/d; P<.06). Similar results were observed d 15 to 23 post-weaning for ADG (365 vs. 379 g; P<.08) and G:F (0.73 vs. 0.76; P<.001). For the 45-d trial, IR did not alter growth performance. In conclusion, irradiation of plasma was an effective tool in reducing microbial contamination but did not improve growth performance in these experiments. Whole diet IR appears to have a negative impact on early nursery growth performance.

Key Words: Pigs, Irradiate, Termin-8


A total of 880 pigs (15 ± 2 d of age) were used in two experiments to determine the effects of irradiation of individual ingredients or whole diet
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, and spray-dried animal plasma, fishmeal, soybean oil, and 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 × 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 and ADFI was improved linearly (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 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


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. Pigs were randomly allotted to one of nine treatments including a control diet or the control diet containing irradiated SDAP (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 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


A total of 193 crossbred weanling 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 allotted 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). Blood samples collected at each feed visit were equalized across dietary treatments by substitution with blood meal. 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. These results indicate that both SDAP and soybean meal can improve the growth performance of nursery pigs weaned at 19 days of age as compared with pigs weaned at 24 days of age.

Key Words: Nursery Pig, Animal Plasma, Irradiation

146 A comparison of roller-dried whey and spray-dried whey in swine starter diets. G. F. Yi1, G. L. Allee1, A. M. Gaines1, C. V. Maxwell2, Z.B. Johnson1, K. M. Halpin1, and M. Trotter2. 1University of Missouri-Columbia, 2International Ingredient Corporation, Inc.

A total of 200 weaned barrows and gilts (5.3 ± 0.3 kg, 100 each) at 2 14 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 pigs weaned at 19 days of age, whereas irradiation of all ingredients or the whole diet does not enhance performance. In Trial 2, ADG and ADFI were improved linearly (P < 0.05) during wk 1, and ADFI was improved linearly (P < 0.05) during wk 4. Efficiency of gain was improved in a linear manner (P < 0.05) 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

147 Non-pasturized, spray-dried egg treated with Termin-8 as a protein source for phase 1 nursery diets. M.E. Davis1, C.V. Maxwell1, Z.B. Johnson1, D.C. Brown1, S. Singh1, K.J. Toucheat2, and J.A. Coe1, 1University of Arkansas, Fayetteville, 2Merrick’s Inc., Union Center, WI.

A conventional nursery trial with 144 crossbred weanling pigs was conducted to determine the efficacy of non-pasturized, spray-dried egg product (EGG) with and without treatment with Termin-8 (a formyldehydro-betaine antimicrobial preservative; T-8) to replace spray-dried plasma (SDP) in the Phase 1 diet (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