

194 Effects of electron beam and gamma ray irradiation levels in spray-dried animal plasma on nursery pig growth performance. C. N. Groesbeck^{*1}, J. M. DeRouchey¹, M. D. Tokach¹, R. D. Goodband¹, S. S. Dritz¹, J. L. Nelssen¹, and H. E. Clemmons², ¹*Kansas State University, Manhattan, 2*Sadex, *Sioux City, IA.*

A total of 385 pigs (PIC, initial BW 6.1 kg) were used in a 28-d trial to determine the effects of electron beam and gamma ray irradiation dosage level to spray-dried animal plasma (plasma) on nursery pig performance. Pigs were allotted to pen and blocked by weight using an incomplete block design with either 7 or 8 replications per treatment. Dietary treatments were randomly allotted to pen within block. There were 7 replications for the negative control, the positive control and the gamma ray irradiation at 2 kGy. All other treatments had 8 replications. Ten dietary treatments were fed from d 0 to 14 including a negative control diet with no added plasma, a positive control diet with added regular plasma, or one of 8 irradiated plasma diets. The eight irradiated treatments included either electron beam or gamma ray irradiated plasma at increasing dosage levels of 2, 4, 6, or 10 kGy. All pigs were fed a common diet from d 14 to 28. Irradiation of the plasma reduced the total bacterial and coliform counts at each dosage level regardless of irradiation source. There were no interactions ($P > 0.05$) between irradiation source and dosage level for the entire trial. From d 0 to 14, pigs fed the diets containing plasma had an increased ($P < 0.01$) ADG (252 vs 204 g) and ADFI (274 vs 222 g) compared to the pigs fed the negative control diet. Pigs fed diets with irradiated plasma had similar growth performance to pigs fed the positive control diet ($P > 0.05$). There were no differences ($P > 0.12$) in growth performance between pigs fed the electron beam or gamma ray irradiated plasma diets. In conclusion, these data indicate that irradiation of plasma by electron beam or gamma ray at various dosage levels reduced total bacteria and coliforms. Irradiation of spray-dried animal plasma did not improve growth performance in this study.

Key Words: nursery pig, spray-dried animal plasma, irradiation

195 Effect of irradiated protein source fed in meal or pelleted diets on nursery pig performance. C. N. Groesbeck^{*}, M. D. Tokach, J. M. DeRouchey, R. D. Goodband, S. S. Dritz, and J. L. Nelssen, *Kansas State University, Manhattan.*

A total of 350 pigs (PIC, initial BW 4.9 kg and 21 ± 3 d of age) were used in a 22-d trial to determine the effects of feeding irradiated protein sources (spray-dried animal plasma, soybean meal, fish meal or all three) in meal and pelleted diets on the growth performance in nursery pigs. Pigs were blocked by weight with 5 pigs/pen and 7 pens/treatment. Pigs were fed one of ten experimental treatments which consisted of a single diet formulation that was fed in either meal or pelleted form containing either no irradiated protein sources or irradiated spray-dried animal plasma, soybean meal, fish meal, or all three irradiated protein sources for phase one (d 0 to 11). All pigs were then fed a common diet for phase two (d 11 to 22). Irradiation of the protein sources, as well as pelleting reduced total bacterial and coliform counts. There were no irradiation \times diet form interactions ($P > 0.16$) observed for growth performance. From d 0 to 11, there was no effect of protein source irradiation ($P > 0.14$) on ADG, ADFI, or G:F. However, pigs fed pelleted diets had improved G:F (0.95 vs 0.90; $P < 0.02$) compared with pigs fed meal diets with no difference in ADG and ADFI. From d 11 to 22, pigs fed meal diets had a tendency for

improved ADFI (738 vs 711 g; $P < 0.10$) compared to the pigs fed pelleted diets. Overall (d 0 to 22), pigs fed diets containing irradiated protein sources had a tendency for improved G:F (0.85 vs 0.83; $P < 0.11$) compared with pigs fed control diets. Pigs fed meal diets had a tendency for improved ADFI (435 vs 418 g; $P < 0.12$) compared with the pigs fed pelleted diets. Pigs fed pelleted diets had improved G:F (0.86 vs 0.83; $P < 0.01$) compared with pigs fed meal diets. These data confirm that technologies of irradiation and pelleting will reduce total bacteria and coliform counts within individual feed ingredients or a complete diet. Pelleting of diets improved feed efficiency but irradiation of proteins source did not improve performance.

Key Words: nursery pig, pellet, irradiation

196 Effect of low protein amino acid-supplemented diets on growth performance, plasma urea N, and diarrhea incidence in weaned pigs. F Opapeju^{*1}, C Nyachoti¹, and M Rademacher², ¹*University of Manitoba, Winnipeg, MB, Canada, 2*Degussa AG, *Rodenbacher Chaussee 4, 63457 Hanau-Wolfgang, Germany.*

The objectives of this study were to determine the growth performance of piglets fed low CPAA-supplemented diets and to determine whether Ile might be the next limiting AA to Lys, Thr, Trp, and Met in low-CP diets fed to weaned pigs. Ninety-six pigs (average initial BW = 6.44 ± 0.14 kg) were assigned to 4 phase 1 diets in a completely randomized design resulting in 6 replicate pens (4 pigs/pen) per diet. Dietary treatments were: 1) 21% CP diet, 2) 19% CP, Ile deficient diet, 3) 19% CP diet supplemented with crystalline Ile up to the level in diet 1, and 4) 17% CP diet supplemented with Ile and Val based on the ideal protein ratio. All diets contained the same amount of standardized ileal digestible Lys, Met + Cys, Thr, and Trp based on the ideal protein ratio. Pigs were weighed weekly to determine ADG, ADFI, and G:F. Baseline and final blood samples were collected on d 0 and 21 for determination of plasma urea N (PUN). On d 4, 5 and 11, fecal consistency (FC) scoring (0, normal; 1, soft feces; 2, mild diarrhea; 3, severe diarrhea) was performed by 2 trained individuals with no previous knowledge of treatment allotment to pigs. Compared to diet 1, pigs fed diet 2 had lower ($P < 0.05$) ADG during wk 1 and 2, and G:F during wk 2. Similarly, pigs fed diet 3 had lower ($P < 0.05$) G:F than those fed diet 1 during wk 1 and 2; and pigs fed diet 4 had lower ($P < 0.05$) G:F compared to other dietary treatments during wk 2. Overall, pigs fed diet 1 had higher ($P < 0.05$) ADG and G:F, and pigs fed diet 4 had higher ($P < 0.05$) ADFI than those fed other diets. Pigs fed diet 1 had higher ($P < 0.05$) final BW than those fed diet 2 but similar final BW compared with those fed diets 3 and 4. Baseline and final PUN concentration were similar across diets. The FC score of pigs fed diet 1 was higher ($P < 0.05$) than those fed diets 3 and 4 on d 4, 11 and overall. The results indicate that low CP diet supplemented with adequate amount of AA supported growth performance of piglets as those fed high CP diet and reduced diarrhea incidence, and that Ile might be limiting in low CP diet fed to weaned pigs.

Key Words: dietary protein, growth performance, weaned pig

197 Amino acid digestibility of protein sources fed to weanling pigs. S. C. Pahlm^{*} and H. H. Stein, *University of Illinois, Urbana.*

he standardized ileal digestibility (SID) of AA by weanling pigs was determined in 4 soybean products, fishmeal (FM), and casein. The 4