159 Incorporation of short-chain fructooligosaccharides and Tylan® into diets of early weaned pigs. M.D. Howard, H. Liu, J.D. Spencer, M.S. Kerley, and G.L. Allee, University of Missouri, Columbia, MO.

Two experiments (263 pigs, average initial BW 6.0 kg, 16 to 23 days of age) were conducted to determine the effect of supplementing three-phase diets with short-chain fructooligosaccharides (SCFOS) and Tylan®. The objective was to determine if the effects of feeding SCFOS and Tylan® on pig performance were additive, synergistic, or antagonistic. The feeding program used three-phase complex diets, with Phase 1 (d 0 to 5) containing a 7% plasma protein diet. All pigs were blocked by BW and allotted within BW to treatments. The treatments used a 4 x 2 factorial arrangement: SCFOS was added at 0, .45 kg/100 kg, 1.13 kg/100 kg, or 2.27 kg/100 kg, and Tylan® was added at either 0 or 100 ppm/908 kg. Experiment 1 lasted 42 d. During Phase 1 (2 wk), Tylan® addition increased ADG (P < .02) and ADFI (P < .02) by 27 g/d. Addition of SCFOS, linearly increased feed efficiency in both Phase 1 (P < .04) and Phase 2 (P < .08). For the entire 42 d, feed efficiency showed a SCFOS x Tylan® interaction (P < .08); feed efficiency was linearly increased (P = .005) as SCFOS increased in the presence of Tylan®. Experiment 2 lasted 38 d. For Phase 1 (18 d) SCFOS addition quadratically affected (P = .04) ADG and feed efficiency. During Phase 2, Tylan® addition increased (P < .04) ADG by 36 g/d. SCFOS quadratically affected ADG (P = .01) and ADFI (P = .03). For the entire 38 d, SCFOS addition quadratically affected ADG (P = .004), ADFI (P = .02), and feed efficiency (P < .06). The quadratic response was typical of the quadratic performance for 1% and 5% SCFOS indicating a positive response could be elicited with as little as 1% SCFOS. The effects of Tylan® and SCFOS seldom showed an interaction suggesting that their mode of action are different: Tylan® is likely inhibiting pathogenic bacteria, while SCFOS may be stimulating beneficial bacteria, providing short-chain fatty acids for energy metabolism in the large intestine, and altering intestinal morphology.

Key Words: Fructooligosaccharides, nursery diets, weaned pigs


Three experiments were conducted to evaluate the effect of an algal derived feed additive, spirulina platensis (SP), on weaning pig performance. In all experiments, pigs were blocked by BW and allotted to treatments at weaning. Standard KSU diets and feeding regimens were used. In Exp. 1, a control diet or diets containing .2, .5, or 2% SP were fed in a pellet form from d 0 to 14 after weaning then in meal form from d 14 to 28. In Exp. 2, treatments included a control diet (no SP, fed for 6 wk), .1% SP (fed for 6 wk), or .2% SP (fed for 1, 2, 4 or 6 wk) with pigs switched to a control diet at the end of the 1, 2, or 4 wk period. In Exp. 3, control or .2% SP diets were fed in either pellet or meal form. In all experiments, SP replaced soybean meal on a lysine basis. From d 0 to 28, diets containing either Bio-Mos® or 2000 ppm Zn from ZnO was equivalent to that obtained by feeding 2000 ppm Zn from ZnO.

Key Words: Swine, Oligosaccharide, Copper

161 Evaluation of the optimal growth promoting level of dietary Zn from a Zn amino acid complex for weanling pigs. J.M. McCalla1, D.D. Gallaher1, L.J. Johnston2, M.H. Whitney1, and G.C. Shurson1,2, University of Minnesota, St. Paul, MN, 1University of Minnesota, Morris, MN.

A total of 324 pigs weaned at 18 ± 2 d of age were used to determine the optimal growth promoting dietary level of Zn from a Zn amino acid complex (ZnAA). Forty-eight pens (6 or 7 pigs/pen) of pigs were blocked by initial weight, sex and litter and assigned to one of six dietary treatments. Pigs were provided ad libitum access to diets for five weeks. Treatments consisted of: 100 ppm Zn from ZnSO4 (NC), 2000 ppm Zn from ZnO (PC), and 100, 200, 300, and 400 ppm Zn from ZnAA, respectively. A three-phase feeding program was used, and all diets within each phase contained the same nutrient levels except Zn. Blood samples from half of the pigs were obtained by venipuncture at the beginning and end of the 5 wk feeding period. Red blood cells were analyzed for superoxide dismutase (SOD) activity. Initial and final plasma Zn, Cu, and Fe levels were determined. Linear and quadratic contrasts were used to compare growth performance, change in SOD activity, change in plasma Zn, Cu, and Fe, and wk 1 fecal scores among ZnAA treatments. Pigs fed PC had greater overall ADG (418 vs. 376 g/d, P < .05) and overall ADFI (670 vs. 587 g/d, P < .01) than pigs fed NC. Pigs fed PC had higher overall ADG (418 vs. 376 g/d, P < .05) than pigs fed ZnAA diets. Within the ZnAA treatments, no linear or quadratic trends were observed for ADG, ADFI, and G/F (P > .10). Dietary treatments had no effect on change in SOD activity during the 5 wk feeding period (P > .10). Pigs fed PC had a greater increase in plasma Zn levels than pigs fed ZnAA diets (P < .07). Pigs fed NC had a greater increase in plasma Cu levels than pigs fed ZnAA diets. Fecal scores during wk 1 tended to increase quadratically (P < .10) as dietary ZnAA level increased. These results suggest that feeding between 100 and 400 ppm Zn from a Zn amino acid complex for a 5 wk feeding period does not elicit a level of growth promotion equivalent to that obtained by feeding 2000 ppm Zn from ZnO.

Key Words: Zinc Amino Acid Complex, Pig Growth, SOD activity