at 4-h post-injection increased (linear, P ≤ 0.05) with increasing n6/n3 (4.1, 5.1, 7.7 µg/dl) and by LPS vs saline (13.9 vs -2.6 µg/dl). Body temperature increased (linear, P ≤ 0.01) with increasing n6/n3 with the LPS (39.5, 39.8, 39.9°C) but not the saline (39.6, 39.6, 39.7°C) injections, with differences (P ≤ 0.05) between injections at the higher two n6/n3 diets. Dietary n6/n3 did not affect ADG ADFI, F/G or immune parameters in response to an immune challenge.

Key Words: Pigs, Fatty Acids, Endotoxin

203 Responsiveness of weaning pigs to Carbadox (Mecadox™) and vitamin B₁₂ supplementation. S. S. Blodgett*, P. S. Miller, and R. L. Fischer, University of Nebraska, Lincoln.

An experiment was conducted to assess the responsiveness of weaning pigs (96 barrows and gilts) to supplemental antibiotics (Carbadox) and vitamin B₁₂. Pigs (initial weight 5.13 kg) were fed one of four diets for a total of 35 days: 1) negative control, common nursery diet with no added Carbadox or vitamin B₁₂; 2) antibiotic, common nursery diet with 55 ppm added Carbadox; 3) vitamin B₁₂, common nursery diet with 80 µg/kg added vitamin B₁₂; and 4) positive control, common nursery diet with 55 ppm added Carbadox and 80 µg/kg added vitamin B₁₂. The study was conducted as a 2 x 2 factorial with 4 replications (pens/pig/pen) per treatment. Pig weights and feed disappearance were measured weekly to determine ADG, ADFI, and feed efficiency (ADG/ADFI). Pigs were visually scored to assess any potential vitamin B₁₂ deficiencies on d 14, 21, 28, and 35. No Carbadox × vitamin B₁₂ interactions were observed (P > 0.10). During Phase I (d 0 to 14), pigs fed Carbadox had a greater ADG (223.5 vs 195.6 g, P < 0.02) and ADFI (P < 0.003) versus pigs not fed supplemental antibiotics. During Phase II and the overall experimental period, pigs fed vitamin B₁₂ had greater ADG (558.1 vs 505.6 g, and 418.6 vs 386.9 g, respectively; P < 0.003), ADFI (P < 0.04), and improved feed efficiency (P < 0.006 and P < 0.03, respectively) compared to pigs not fed supplemental vitamin B₁₂. During Phase II and the overall experimental period, pigs fed vitamin B₁₂ had greater ADG (35 µg/kg of diet), 2) 2X, addition of 100% the 1998 NRC-requirement for a 5- to 10-kg pig for vitamin B₁₂ (70 µg/kg of diet), 5) 8X, addition of 800% the 1998 NRC-requirement for a 5- to 10-kg pig for vitamin B₁₂ (350 µg/kg/kg of diet), 4) 4X, addition of 400% the 1998 NRC-requirement for a 5- to 10-kg pig for vitamin B₁₂ (150 µg/kg/kg of diet), and 6) 16X, addition of 1600% the 1998 NRC-requirement for a 5- to 10-kg pig for vitamin B₁₂ (280 µg/kg/kg of diet). Pig weights and feed disappearance were measured weekly to determine ADG, ADFI, and feed efficiency (ADG/ADFI). Pigs were visually scored to assess any potential vitamin B₁₂ deficiencies on d 14, 21, 28, and 35. No Carbadox × vitamin B₁₂ interactions were observed (P > 0.10). During Phase I (d 0 to 14), there were no growth or feed intake responses to supplemental vitamin B₁₂. During Phase II (d 15 to 35), ADG and ADG/ADFI responded quadratically to vitamin B₁₂ supplementation (P < 0.007 and P < 0.02, respectively). Pigs fed 8X the NRC requirement for the 5- to 10-kg pig had the greatest ADG (699 g) and pigs fed 4X the NRC requirement had the greatest ADG (477 g). Also, there was a quadratic ADG/ADFI response (P < 0.02). Pigs supplemented with 4X the NRC requirement had the greatest ADG/ADFI (0.718 g/g).

Feed intake did not respond to vitamin B₁₂ supplementation. Based on these results, the vitamin B₁₂ requirement of the 5- to 10-kg pig is similar to that recommended by the 1998 NRC (17.5 µg/kg). The 10- to 20-kg pig responded to vitamin B₁₂ supplementation between 4.5 and 9 times the dietary concentration that is currently recommended by the 1998 NRC (35 µg/kg of diet).

Key Words: Nursery, Pigs, Vitamin B₁₂


Four experiments were conducted to determine the effects of different wheat gluten (WG) sources compared to soybean meal (SBM) or spray-dried animal plasma (SDAP) on growth performance of nursery pigs. In Exp. 1, 220 pigs (6.1 kg BW; 8 pens/trt; 6 pigs/pen) were fed a control diet containing 6% of either SDAP, enzymatically hydrolyzed WG, or non-hydrolyzed WG. The WG and L-lysine HCl replaced 50% or 100% of the SDAP. From d 0 to 21, increasing WG (either source) decreased ADG and ADFI (linear, P < 0.01), but improved G/F (linear, P < 0.04). In Exp. 2, 252 pigs (6.2 kg BW; 6 pens/pen; 4 pigs/pen) were fed a negative control containing no SDAP or WG, the control diet containing either 3, 6, 9, or 12% spray-dried WG, or a positive control diet containing 5% SDAP. The diets containing 9% WG and 5% SDAP had the same amount of SBM. From d 0 to 7, pigs fed 5% SDAP had greater (P < 0.05) ADG than pigs fed the diet containing 9% WG. Overall (d 0 to 14), increasing WG had no effect (P > 0.05) on ADG, ADFI, or G/F. In Exp. 3, 240 pigs (7.0 kg BW; 7 pens/trt; 5 pigs/pen) were fed a negative control diet containing no WG or SDAP, the control diet containing either 3, 6, 9, or 12% spray-dried WG, or a positive control diet containing 5% SDAP. The diets containing 9% WG and 5% SDAP had the same amount of SBM. From d 0 to 7, pigs fed 5% SDAP had greater (P < 0.05) ADG than pigs fed the diet containing 9% WG. For the overall experimental period, pigs fed Carbadox had greater ADFI (223.5 vs 195.6 g, P < 0.02) and ADG/ADFI (0.718 g/g) than pigs fed the control diet containing no supplemental antibiotics. During Phase I (d 0 to 14), pigs fed Carbadox had lower ADG and ADFI (P < 0.02 and P < 0.04, respectively). There were no differences among groups for visual assessment of B-vitamin deficiencies. Pigs responded to vitamin B₁₂ in the absence of antibiotic in the diet. The results from this study indicate that the vitamin B₁₂ requirement of 10- to 20-kg pigs may be greater than the current NRC requirement recommendation.

Key Words: Nursery Pigs, Antibiotic, Vitamin B₁₂

204 Vitamin B₁₂ requirement of weaning pigs. S. S. Blodgett*, P. S. Miller, and R. L. Fischer, University of Nebraska-Lincoln.

An experiment was conducted to help define the vitamin B₁₂ requirement of the 5- to 20-kg pig. A total of one hundred and forty-four pigs (barrows and gilts; initial weight = 5.08 kg) were fed one of six diets (4 pigs/pen; 6 replications) at a total of 35 days: 1) negative control, common nursery diet with no added vitamin B₁₂; 2) antibiotic, common nursery diet with 55 ppm added Carbadox; 3) vitamin B₁₂, common nursery diet with 80 µg/kg added vitamin B₁₂; and 4) positive control, common nursery diet with 55 ppm added Carbadox and 80 µg/kg added vitamin B₁₂. The study was conducted as a 2 x 2 factorial with 4 replications (pens/pig/pen) per treatment. Pig weights and feed disappearance were measured weekly to determine ADG, ADFI, and feed efficiency (ADG/ADFI). Pigs were visually scored to assess any potential vitamin B₁₂ deficiencies. Pigs responded to vitamin B₁₂ in the absence of antibiotic in the diet. The results from this study indicate that the vitamin B₁₂ requirement of 10- to 20-kg pigs may be greater than the current NRC requirement recommendation.

Key Words: Piglets, Fatty Acids, Endotoxin

206 An evaluation of barley, corn or wheat-based diets, with and without glucanase and xylanase addition, on the nitrogen balance and ammonia emission of finishing boars. A.B.G. Leek1, V. E. Beattie2, W. Henry3, and J. V. O'Doherty4. 1University College Dublin, Ireland, 2Devenish Nutrition Ltd., Belfast, Northern Ireland.

Finishing boars (67 kg) were used in a 3 x 2 factorial arrangement of treatments to investigate the interaction between cereal-soybean (Corn: barley (B), maize (M) and wheat (W)) based diets and non-starch polysaccharide (NSP) enzyme inclusion (with (+) or without (-) a xylanase and glucanase combination) on nitrogen (N) balance and ammonia nitrogen (NH₃-N) emission. The diets were formulated to have similar concentrations of DE (13.2 MJ DE/kg) and amino acids (11 g Lys/kg, 180 g CP/kg). The NSP contents of the diets were: B = 138 g/kg, M = 104 g/kg and W = 86 g/kg. Following diet adaptation, boars were housed in metabolism crates fitted with urine and feces separators for 12 d (5 d adaptation and 7 d N balance). An in-vitro measurement of NH₃-N emitted over 10 d and recovered from the headspace-air drawn over the surface of a fresh slurry sample collected during the N balance experiment, was performed. Volatile fatty acid (VFA) content in feces was quantified and qualified by HPLC. Boars fed B- or M-based diets had lower digestibility of (P < 0.05) DM (DMD), GE (GED) and lower urinary N to fecal N excretion ratio than boars fed W-based diets. Parent digestibility of N was lower (P < 0.02) in B- compared to W- N. Feed intake was not affected by cereal type. The SDAP of WG, more reduced (P < 0.05) DMD and GED in B and M, however there was no effect in W. The addition of enzymes reduced the digestibility of acid

Key Words: Pigs, Wheat Gluten, Spray-dried Animal Plasma