

119 Effects of superdosing of microbial phytase in diets for weanling pigs. T. D. Crenshaw*¹, O. Adeola², M. J. Azain³, S. K. Baidoo⁴, S. D. Carter⁵, G. M. Hill⁶, S. W. Kim⁷, P. S. Miller⁸, M. C. Shannon⁹, and H. H. Stein¹⁰, ¹University of Wisconsin, Madison, WI, ²Purdue University, Lafayette, IN, ³University of Georgia, Athens, GA, ⁴University of Minnesota, Minneapolis, MN, ⁵Oklahoma State University, Stillwater, OK, ⁶Michigan State University, East Lansing, MI, ⁷North Carolina State University, Raleigh, NC, ⁸University of Nebraska, Lincoln, NE, ⁹University of Missouri, Columbia, MO, ¹⁰University of Illinois, Urbana-Champaign, IL.

An experiment using 390 crossbred pigs (20 replications of 3 or 4 pigs/pen) was conducted at 10 research stations to assess the effects of superdosing phytase on nursery pig growth performance. Corn-soybean meal phase 2 nursery diets were fed for 21-d from 8.5 to 17.6 kg BW. A common premix was formulated using the NCCC42 formulations, and mixed at a central location. Diets were formulated to contain 1.35% standardized ileal digestible (SID) Lys. The positive control diet contained 0.8% Ca, 0.69% P and 0.40% standardized total-tract digestible (STTD) P. The negative control diet contained 0.50% Ca, 0.42% P and 0.18% STTD P. Dietary phytase (Ronozyme HiPhos) was added to the negative control diet premix to provide 0, 500, 1,500 or 3,000 phytase units (FTU)/kg complete diet. On d21, one pig per pen was killed and the 3rd and 4th metacarpals from the right front foot were analyzed for total bone ash. Data were analyzed using the Glimmix procedure of SAS. Pigs were randomly selected based on weight, age, sex, and ancestry. Station by treatment effects were observed for ADG in wk 2 and for the entire period, and for ADFI in wk 2, wk 3, and for the entire period. Body weight gain linearly increased as increased concentrations of phytase were added to the negative control diet (360, 440, 450, and 470 g/d; $P < 0.01$), but ADFI (640, 710, 700, 720 g/d) was not affected during the 21-d study. A linear increase ($P < 0.05$) in G:F was observed as phytase additions increased (0.56, 0.62, 0.64, 0.65 g/g for pigs fed diets containing 0, 500, 1,500, or 3,000 FTU of phytase). Percent bone ash also increased (linear, $P < 0.01$) as addition of phytase increased (44.6, 48.4, 49.2, and 50.6% for pigs fed diets containing 0, 500, 1,500 or 3,000 FTU of phytase, respectively). Percent bone ash was not different between pigs fed the positive control diet and the negative control diet containing 3,000 FTU/kg of phytase (51.1 vs. 50.5%, respectively). In this 21-d study, feeding phase 2 nursery diet containing up to 3,000 FTU/kg resulted in similar growth performance and bone ash percentage as pigs fed a positive control diet containing 0.8% Ca, 0.69% P and 0.40% STTD P.

Key Words: phosphorus, pig, phytase