Efficacy of different phytase products for young chicks and pigs. N.R. Augspurger, D.M. Webel, X.G. Lei, and D.H. Baker. 1University of Illinois at Urbana-Champaign, 2United Feeds, Inc. Sheridan, IN, 3Cornell University, Ithaca, NY.

Two chick trials and one pig trial were done to investigate the phosphorus-releasing efficacy of different phytase products when added to corn-soybean meal diets containing no supplemental inorganic P (Pi). All phytase premixes were assayed (Na-phytate assay) for phytase activity (U/g) prior to use. In the chick trials, five pens of four chicks were fed each diet from 8 to 22-d posthatching. The first chick assay involved feeding five levels of Pi (0, 0.10, 0.20, 0.30, 0.40% Pi) to corn-soybean meal diets containing no supplemental inorganic P (Pi). Each enzyme was added to corn-soybean meal diets containing no supplemental inorganic P (Pi). Lime-stone was added to maintain Ca at a 2.5:1 ratio with aP. Each enzyme product was analyzed for phytase and added at levels of 150, 300 and 450 FTU/kg diet. (Treatments 5-7 and 8-10 for Natuphos and Ronozyme, respectively). Data from the three trials were combined and treatment responses evaluated using the slope ratio procedure. Significant linear responses for bone ash were found for MCP (R² = 0.983, P = 0.008) and for Natuphos (R² = 0.986, P = 0.007). For Ronozyme the linear response was not significant (R² = 0.779, P = 0.117). A prediction of aP release for Ronozyme was not made based on the non-linearity of the response. Based on these data, the calculated release of available phosphorus relative to MCP for 450 FTU from Natuphos is 0.109%.

Key Words: Phytase, Natuphos

Available phosphorus requirement for 33 to 55 kg pigs reared in commercial facilities. C. W. Hastad*, S. S. Dritz, J. L. Neisson, M. D. Tokach, and R. D. Goodband, Kansas State University, Manhattan, Kansas.

Two experiments were conducted in commercial research barns to determine the appropriate dietary phosphorous level for pigs from 33 to 55 kg. In Exp 1, 600 gilts (initially 43.2 kg) were randomly allotted to 10 treatments (both on a diet with NaCl added). All diets contained 0.20% aP and 0.5% calcium. An industry-typical corn/soy basal diet was formulated to be adequate in all nutrients except phosphorus and calcium, mixed and subdivided into ten aliquots. The basal diet contained 0.20% aP and 0.5% calcium. Treatments 1-4 were created by adding monocalcium phosphate (MCP) to yield diets containing 0, 0.05%, 0.10% and 0.15% added aP. Lime-stone was added to maintain Ca at a 2.5:1 ratio with aP. Each enzyme product was analyzed for phytase and added at levels of 150, 300 and 450 FTU/kg diet. (Treatments 5-7 and 8-10 for Natuphos and Ronozyme, respectively). Data from the three trials were combined and treatment responses evaluated using the slope ratio procedure. Significant linear responses for bone ash were found for MCP (R² = 0.983, P = 0.008) and for Natuphos (R² = 0.986, P = 0.007). For Ronozyme the linear response was not significant (R² = 0.779, P = 0.117). A prediction of aP release for Ronozyme was not made based on the non-linearity of the response. Based on these data, the calculated release of available phosphorus relative to MCP for 450 FTU from Natuphos is 0.109%.

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Effect of zinc oxide and copper sulfate interactions with sodium chloride in nursery pig diets. T.G. Wiseman* and D.C. Mahan, The Ohio State University.

Previous research suggested that the addition of NaCl to nursery diets improved pig performance, largely due to the Cl ion improving N digestibility. Other research has demonstrated that the addition of dietary zinc oxide or copper sulfate can also enhance pig growth during the postweaning period. Because the Cl ion can alter the pH in the intestinal tract, it could affect the microbial population and mineral status in the intestinal tract. Therefore an experiment was conducted using a 2 X 2 factorial arrangement in a RCB design conducted in 5 replicates to evaluate if an interaction exists between added dietary levels of NaCl and for Natuphos (R² = 0.986, P = 0.007). For Ronozyme the linear response was not significant (R² = 0.779, P = 0.117). A prediction of aP release for Ronozyme was not made based on the non-linearity of the response. Based on these data, the calculated release of available phosphorus relative to MCP for 450 FTU from Natuphos is 0.109%.

Key Words: Phytase, Natuphos


Phytases are a group of enzymes that degrade phytate to yield inorganic phosphorus and various isoforms of inositol. Microbial phytase enzymes are known to differ in their ability to react with phytate to be released to phosphorus. A series of studies, three consecutive trials identical in design were conducted to determine the relative efficacy of phytase from Aspergillus niger (Natuphos) and from Pseudomonas lyzae (Ronozyme). For each trial, 400 male broiler chicks were randomly placed in 40 battery cages and assigned to one of ten treatments (4 replications). An industry-typical corn/soy basal diet was formulated to be adequate in all nutrients except phosphorus and calcium, mixed and subdivided into ten aliquots. The basal diet contained 0.20% aP and 0.5% calcium.

Means in same row with unlike superscripts differ (P < .05).

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