The Use of Steered Ileo-cecal Valve Cannulated Pigs to Evaluate the Effects of Adding Phytase or β-mannanase to the Diet on Amino Acid, Mineral and Energy Utilization

by

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(ABSTRACT)

Forty-six barrows fitted with steered ileo-cecal valve cannulas were used in four experiments to evaluate the effects of supplementing swine diets with microbial phytase or β-mannanase on the apparent ileal (AID) and/or apparent total tract digestibility (ATTD) of amino acids, N, Ca, P, DM and energy. In Exp. 1, the addition of phytase to low CP corn-soybean meal based diets increased the AID of Ca (P < .01), P (P < .001), and all amino acids (P < .10) measured except Leu, Ser, Pro, Met, His and Tyr. In Exp. 2, the addition of microbial phytase to corn-soybean meal, corn-soybean meal-wheat middlings, or corn-soybean meal-meat and bone meal based diets resulted in increased AID of Ca and P, but had no effect (P > .1) on amino acid digestibilities. Diet type affected all digestibility measurements, but did not affect the efficacy of supplemental phytase. In Exp. 3, the addition of microbial phytase to corn-wheat-soybean meal, corn-wheat-cannola, or sorghum-corn-soybean meal based diets led to an increased ( P <.05) AID of P, Asp, Thr, Ser, Ala, Tyr, Phe, Lys and Arg. In Exp. 4, the addition of β-mannanase to corn-soybean meal based swine diets led to an increased AID of DM and ATTD of energy. In addition, the AID of all amino acids measured were increased numerically, with many of these values approaching significance. The results of these studies demonstrate that supplementing pig diets with phytase or β-mannanase, results in an increased digestibility of certain dietary components due to the breakdown of anti-nutritive compounds in the diet.
Key Words: Pig, Phytase, β-Mannanase, Cannula, Amino acids, Digestibility