

Effect of body weight and reproductive status on phosphorus digestibility and efficacy of phytase in pigs

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An experiment was conducted to determine the effect of BW and reproductive status on the apparent ileal (AID) and apparent total tract (ATTD) digestibility coefficients of P, and the efficacy of phytase in pigs. Six growing pigs (10 to 40 kg BW), six finishing pigs (40 to 130 kg BW), and 6 sows were surgically fitted with a T-cannula in the distal ileum and used in the experiment. Two experimental diets were formulated. Diet 1 was a corn-soybean meal-canola meal-based diet containing 0.45% total P. Diet 2 was identical to diet 1, except that 500 FYT/kg of *Peniophora lycii* phytase (Ronozyme P[®]) was added to this diet. The Ca to total P ratio was 1.1:1 in both diets. Chromium oxide was included in the diets at 0.25% as an inert marker. In the growing and finishing pigs, AID and ATTD of P were determined at 10, 20, 40, 70, 100, and 130 kg BW. In sows, AID and ATTD were determined in each trimester of gestation and in lactation. In growing pigs, BW had no effect on AID or ATTD – regardless of the diet being fed. In finishing pigs, AID and ATTD decreased linearly ($P < 0.01$) as BW increased from 40 to 130 kg. In both growing and finishing pigs, phytase supplementation improved ($P < 0.05$) both AID and ATTD. A linear increase ($P < 0.01$) in AID and ATTD was observed as sows proceeded through gestation and lactation, but phytase addition increased ($P < 0.05$) AID only in lactation; no response was observed in any of the trimesters of gestation. Phytase improved ($P < 0.05$) ATTD during late gestation and lactation, but not during early and mid gestation. There were no differences between AID and ATTD in pigs and sows fed the control diet.

This was also the case for growing pigs and sows fed the phytase supplemented diet. Results from this experiment demonstrate that both BW and the physiological status of the animal influence the digestibility of P in pigs. The addition of microbial phytase improves the digestibility of P in all groups of animals except gestating sows. It is also concluded that ileal and total tract digestibility coefficients are identical.

Key Words: Digestibility, Pigs, Phosphorus, Phytase, Sows