Effects of the dietary phosphorus concentration on phosphorus digestibility in monocalcium phosphate

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An experiment was conducted at 5 experiment stations to determine if the dietary inclusion level of P influences the apparent total tract digestibility (ATTD) of P in monocalcium phosphate (MCP). A total of 66 barrows (initial BW: 22.02 ± 2.15 kg) were allotted to 6 treatments with 11 replications per treatment. All pigs were placed in metabolism cages that allowed for the total, but separate, collection of urine and feces. The basal diet was based on corn (54.2%), soybean meal (20%), and cornstarch and was formulated to contain 0.29% P without using inorganic P. Five additional diets were formulated by adding P from MCP in 5 increments of 0.07% to the basal diet. This created treatment diets that were formulated to contain 0.36, 0.43, 0.50, 0.57, and 0.64% P, respectively. Limestone was added to maintain a calculated Ca:P ratio of 1.2:1. The ATTD and balances of Ca and P were calculated. By subtracting the contribution from the basal diet to the other diets, the ATTD and balance for P in MCP was calculated using the difference procedure. Results of the experiment showed that the ATTD (i.e., absorption) and retention of both Ca and P increased (linear, $P < 0.001$) with increasing concentrations of Ca and P in the diet. The ATTD of Ca was not affected by the dietary level of Ca. However, the ATTD for P increased (linear, $P < 0.001$) as MCP was added to

the diet, which is a result of P in MCP being more digestible than the organic P in corn and soybean meal. Increasing P intake from MCP increased (linear, $P < 0.001$) the excretion of P in feces and urine, but the quantity of P absorbed and retained increased (linear, $P < 0.001$) as more P from MCP was added to the diet. However, when expressed as a percent of P intake from MCP, P retention was not affected by the dietary level of P. Likewise, the ATTD for P in MCP was not different among treatments regardless of the concentration of P in the diet. Results of this experiment demonstrate that the apparent digestibility (i.e., absorption) of P in MCP is not influenced by the dietary concentration of P.

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