

Public Abstract

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Title: Evaluation of the efficacy of high levels of microbial phytase in broilers

Approximately two-thirds of the phosphorus in plants is bound in a molecule called phytate. Phytase is the enzyme capable of breaking apart phytate. Poultry have insufficient phytase in their digestive tracts which makes most of the phosphorus in plants unavailable. The unavailability of phosphorus increases the need to add inorganic sources of phosphorus in poultry diets. The combination of phytate bound phosphorus and unused inorganic phosphorus increases the amount of phosphorus excreted in the manure. When poultry manure high in phosphorus is applied to land as fertilizer it can lead to environmental problems such as soil saturation, run-off, and eutrophication which can kill aquatic life. Commercial phytases are available and are effective at improving phytate phosphorus utilization in broilers. Many enzyme companies are continuously improving their phytase products for thermo stability and efficacy. Previous research suggests broiler performance plateaus at phytase inclusion levels of 500 to 1,000 PU/kg diet. Recent research suggests that bird performance may continue to improve as dietary phytase levels increase above current industry recommendations. Three experiments were conducted to evaluate the efficacy of high levels of microbial phytase in broilers. In all three experiments, the diets containing phytase had lower levels of calcium and phosphorus. Phytase was included in the experimental diets at 0, 250, 500, 2,500, 10,000, 12,500, 20,000, and 62,500 PU/kg. In young broilers, high levels of dietary phytase improved body weight gain above the NRC recommended diet. However, as the birds reached market weight, body weight gain was not different. Total litter phosphorus was decreased in treatments containing high levels of phytase by 29, 33, and 53 percent. Results of this research indicate that microbial phytase was efficacious in broiler diets. However, there were no added benefits to feeding high levels of dietary phytase to broilers raised to market weight.