Dietary cholecalciferol and phosphorus influence intestinal mucosa phytase activity in broiler chicks.

Adeola, O; Asem, EK,; Onyango, EM,

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Abstract:

1. The role of cholecalciferol and phosphorus in the regulation of intestinal mucosa phytase was investigated in broiler chicks. 2. A total of 144 7-d-old male broiler chicks were grouped by weight into 6 blocks of 4 cages with 6 broiler chicks per cage. Four maize-soybean meal-based mash diets were randomly assigned to cages within each block. The 4 diets consisted of cholecalciferol at 0 or 75 microg/kg and total phosphorus at 3.6 or 7.0 g/kg in a 2 x 2 factorial arrangement. The birds were given the experimental diets for 12 d under conditions which excluded ultraviolet light. 3. Broiler chicks fed on diets with the higher concentration of cholecalciferol had higher Vmax and Km of the mucosa phytase, weight gain, feed intake, feed efficiency and percentage tibia ash, higher ileal digestibility of dry matter, energy, phosphorus (P) and calcium (Ca), and increased retention of dry matter, nitrogen, P, Ca and energy. 4. Broiler chicks receiving diets with the higher P concentration showed lower Vmax and Km of the intestinal mucosa phytase but greater weight gain, feed intake, feed efficiency and percentage tibia ash, higher ileal digestibility of dry matter, energy, P and nitrogen, and increased retention of dry matter, energy, nitrogen and Ca. 5. In conclusion, both dietary P and cholecalciferol influenced the activity of intestinal mucosa phytase.