

The effect of supplementary bacterial phytase on dietary metabolisable energy, nutrient retention and endogenous losses in precision fed broiler chickens

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Abstract

Thirty-two Ross 308 male broiler chickens were used in a precision feeding assay to investigate the effect of exogenous phytase (EC 3.1.3.26) on dietary apparent metabolisable energy (AME), dry matter digestibility (DMD) coefficient, nitrogen (NR), amino acid and mineral retentions. The excretion of endogenous losses measured as sialic acid (SA) was also determined. Four dietary treatments (control (C), C + 250 FTU (phytase units per kg feed), C + 500 FTU, and C + 2500 FTU) were studied with each treatment replicated eight times in randomised complete block design. Diets were formulated to be nutritionally adequate with the exception of available P content (2.3 g/kg non-phytate P). Over the 48-h collection period, the phytase fed birds retained 29.3 mg more Na and 2.3 mg more Zn ($p < 0.05$) than the control fed birds, with the relationship between phytase dose and Na and Zn retention being best described by a linear function ($p < 0.05$ and $p < 0.001$, for Na and Zn, respectively). Phytase supplementation did not have an effect on dietary AME, DMD and NR. However, increasing the dose of phytase led to a linear increase in dietary amino acid retention ($p < 0.05$). Dietary phytase decreased total sialic acid excretion in a linear fashion ($p < 0.05$). It can be concluded that supplementary phytase increases the retention (reduces the excretion) of dietary Zn and Na in broiler chickens. The beneficial effects of the addition of exogenous phytases to poultry diets seems to be mediated through improved dietary nutrients absorption and reduced endogenous losses.

Keywords:

chickens; phytase; sodium; endogenous losses