EFFECTS ON PRODUCTIVE PERFORMANCE, TIBIA CALCIUM AND PHOSPHOROUS RETENTION, AND LIVER ENZYMES ACTIVITY OF ACIDIFIED AND ALKALINIZED DIETS IN BROILER CHICKEN*

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Abstract

A 35-day experiment was carried out to study the effects of acidified and alkalinized diets on zootechnical indices, tibial calcium and phosphorous retention, bone mineralization and liver enzymes activity using 250 Ross 308 male broiler chicks. Five treatments consisting of a control diet (CD), CD acidified using 10, 20 and 30 g/kg citric acid (CA) and CD alkalinized with Ca (OH)₂ (8.9 g/kg in growth period and 8.6 g/kg in finisher period) were examined in 5 replicates of 10 birds each from day 7 up to day 42 of age. Inclusion of 30 g/kg CA significantly increased body weight, average daily gain (ADG), average daily feed intake (ADFI), feed efficiency, tibia ash, tibial Ca content, at day 42 of age (P<0.05). Serum alkaline phosphatase and lactate dehydrogenase activities were elevated in the birds fed with the 30 g/kg CA-treated diet at day 42 of age (P<0.05). Alkalinized diet significantly reduced ADFI, tibia ash, tibial P and Ca contents, bone breaking strength and plasma Ca concentration (P<0.05). It was concluded that the diet acidified with 30 g/kg CA promoted productive performance and tibia mineralization in broiler chicken. Alkalinized diet suppressed growth performance of the birds perhaps through disrupted mineral absorption and altered liver enzymes activity.

Key words: citric acid, broiler chicken, alkalinized diet, tibia mineral retention

Acidification of diets further activates the functionality of proteolytic enzymes (Daskiran et al., 2004), reduces ammonia and other growth-depressing microbial metabolites in broiler gut (Dibner and Buttin, 2002), favoring mineral absorption (Chowdhury et al., 2009), and lowering the incidence of subclinical infections (Chaveerach et al., 2004). Moreover, CA appears to have a positive impact on histology of the small intestine, thereby facilitating nutrient absorption and growth performance in broiler...