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Effect of different levels of *Macleaya cordata* alkaloid extract in low protein diets on growth performance, apparent ileal digestibility of protein, intestinal morphology and immune responses of broiler chickens

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Abstract

The current study was conducted to evaluate the effects of feeding different levels of *Macleaya cordata* alkaloid extract (MCAE) (0, 180, 360, or 540 mg/kg diet) in diets containing 2 dietary concentrations of protein (100 and 95% of established requirements; normal and low-protein diets, respectively), on the growth performance, carcass yield, protein ileal digestibility, plasma free amino acid concentrations and some immune responses in broiler chickens. Accordingly, a total of 560, 1-d-old male broiler chickens (Ross 308) were randomly assigned to 8 dietary treatments with 5 replicates (14 broiler chickens per Replicate) in a 2 × 4 factorial arrangement. The results showed that the chicks fed diets containing 540 mg/kg MCAE in both normal and low-protein diets had 3.2% higher body weight (BW) than control group at 35 d of age ($P < 0.05$). In addition, accompanied by increase dietary supplementation of MCAE from 0 to 540 mg/kg overall average daily weight gain and feed conversion ratio were improved by 2.7 and 1.3%, respectively. Carcass yield of broiler chicks fed diets containing normal protein and supplemented with 180 mg/kg MCAE was significantly ($P < 0.05$) higher than those fed low protein diets supplemented with 0, 180 and 360 mg/kg MCAE. Accompanied by increase dietary supplementation of MCAE from 0 to 540 mg/kg, average ileal digestibility of crude protein improved by about 5.9% and reached from 72.8% to 78.7% ($P < 0.05$). Dietary treatments had no significant effects on plasma free Met and Thr concentrations and serum creatinine concentrations at d 35. Dietary treatments had no significant effects on immune responses of broiler chickens at 15 d of age. In summary, these results indicated that supplementing diet 540 mg/kg MCAE may improve body weight, feed intake, and feed conversion ratio of broiler chickens by 3.3, 1.5 and 1.3% and also reduce their abdominal fat percentage by about 21.7% at their slaughter age.

Keywords: Broiler chicken; *Macleaya cordata* alkaloid extract; Growth performance; Protein ileal digestibility; Immune responses.