

Growth performance, blood characteristics and plasma lipids of growing pullet fed dietary concentrations of organic and inorganic copper sources

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Abstract

A 140-day study was conducted to determine the influence of dietary organic Cu (Cu proteinate) and inorganic Cu (CuSO_4) on growth performance, blood characteristics and plasma lipids of growing pullet. 480 day-old Kabiru® breed chicks were randomly allocated to 6 treatment groups of 80 birds split over 4 replicates of 20 birds each. The diets consisted of a basal diet (containing 32.84 and 31.78 mg/kg Cu for starter and grower phases respectively) supplemented with organic Cu (Cu proteinate; Cu-P) or inorganic Cu (Cu sulphate; CuSO_4) fed at 3 dietary concentrations (50, 100 and 150 mg/kg). No significant ($P > 0.05$) effect of Cu source, concentration and interaction of Cu source and concentration was obtained for growth response at starter and grower phases. CuSO_4 supplementation resulted in elevated ($P < 0.05$) serum uric acid. Supplementation of diets with 150 mg/kg Cu resulted in the reduction ($P < 0.05$) of white blood cell count of the birds. Cu-P decreased ($P < 0.05$) plasma cholesterol, low density lipoprotein (LDL) and triglyceride in comparison to CuSO_4 . CuSO_4 supplementation resulted in increased high density lipoprotein (HDL). Cu concentration elicited a linear response ($P < 0.05$) for total cholesterol, LDL and triglyceride. It was concluded that the source and concentration of Cu did not lead to a significant difference in growth performance. Furthermore, Cu-P reduced ($P < 0.05$) the plasma cholesterol concentration of the experimental birds when compared to CuSO_4 . Also plasma cholesterol concentration reduced ($P < 0.05$) with increased dietary Cu concentration.

Keywords

Copper; Growth; Lipid; Performance; Pullet