

Haematological and biochemical responses of starter broiler chickens fed copper and probiotic supplemented diets

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Abstract

A study was conducted to investigate the haematological and biochemical responses of starter broiler chickens fed copper and probiotics supplemented diets. A total of 180-day old Marshal broiler chicks were randomly allotted to six treatment groups of 30 birds each. The treatments were divided into three replicates of ten birds each; starter diet was formulated and fed for a period of twenty-eight days. The dietary treatments were subjected to complete randomized design arranged in a 2×3 factorial arrangement was made up of probiotics (0 and 500ppm) and copper (0, 125 and 250mg). Data were collected on haematological and serum biochemical indices. Data obtained were analysed using analysis of variance (ANOVA) and, Duncan's Multiple Range Test was used to separate significant means. Dietary supplementation of copper and probiotics showed significant influence ($P < 0.05$) on haematological and biochemical indices. Biochemical analyses revealed higher significant ($P < 0.05$) copper × probiotics interaction values of 42.81 g/l, 19.50 g/l and 23.31 g/l for total protein, albumin and globulin respectively in the birds fed 250 mg/kg copper × 500 ppm probiotics /kg. Birds fed control diet recorded lower significant ($P < 0.05$) values of 33.85 g/l and 15.40 g/l for total protein and albumin. In contrast, birds fed diet supplemented with 250 mg/kg copper × 500 ppm probiotics /kg recorded least significant ($P < 0.05$) copper x probiotics interaction values of 149.20 mg/dl, 49.00 mg/dl, 46.48 mg/dl and 81.56 mg/dl for cholesterol, triglyceride, high density lipoprotein and low density lipoprotein respectively. Birds on control diet recorded highest values for cholesterol, triglyceride, high-density lipoprotein and low density lipoprotein (respectively). Dietary copper and probiotics supplementation influenced haematological parameters. Copper x probiotics interaction significantly ($P < 0.05$) influenced white blood cell, glucose, lymphocyte and eosinophil. Broilers fed diet containing 250 mg/kg copper x 500 ppm probiotics /kg had significantly higher white blood cell ($30.65 \times 10^9/L$) than the birds on control diet ($26.15 \times 10^9/L$). No significant ($P > 0.05$) copper × probiotic interaction influence on packed cell volume, haemoglobin, red blood cell, neutrophil and monocyte. It can be concluded that dietary copper and probiotics supplementation had significant interaction influence on birds at 250 mg/kg copper × 500 ppm probiotics /kg supplemental level. It could be inferred that the supplementation of both copper and probiotics to starter broiler diet significantly improved the immune-competence of the broiler starters.

Keywords: haematological; biochemical; copper; probiotics; broiler chicken

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Target Audience: Nutritionist, researchers, feed millers and poultry farmers