

USE OF NANO-COPPER AS A GROWTH PROMOTER AND ANTI-BACTERIAL AGENTS IN BROILER PRODUCTION

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Executive Summary

Minor amount of copper is a key element required for poultry muscle growth, act as antioxidant as well as anti-bacterial agent but excess amount causes economic losses, toxicity and environmental pollutions. On the other hand, proper amount of copper is essential in poultry meat for safety to human consumption as judged by Recommended Daily Allowance (RDA) and Maximum Permitted Concentration (MPC). To study the above said factors, a total of 160 day old broiler chicks were used in this study to assess the growth, immune cell and organ, health status of villi and concentrations of copper (Cu) in liver, bone and faeces. After an adaptation period of one week, the chicks were equally and randomly divided into 5 treatment groups having 4 replication groups. Each replication consists of 8 chicks and each treatment has 32 chicks. Copper particle size was <100 nm. The dietary treatments were T_0 = Control group or group supplied basal diet, T_1 = 5 mg (nano-Cu powder), T_2 = 10mg (nano-Cu powder), T_3 = 15mg (nano-Cu powder), T_4 = 10mg (Cu powder). 20 (1.0 g of each) samples were treated with conc. Nitric acid and digested to get analyst copper in solutions. FCR and copper concentration in bone differ among treatments but non-significant ($P > 0.05$) with each other. Though lowest FCR found in T_2 and highest FCR were found in T_0 . However, in case of liver and faeces, copper concentration in T_3 (15 mg nano-copper) is highly significant ($P < 0.05$) with the other treatments. In case of immune-organ, bursa and thymus both are highly significant in T_1 (5 mg nano-copper) with the others. On the other hand, *E. coli* and salmonella spp. count was significantly ($P < 0.05$) lower in birds fed a 15mg nano-copper supplemented diet and with a descending order of T_2 and T_1 . Salmonella sp. and *E. coli* count were also significantly ($p < 0.05$) higher in birds fed control and copper particles with the nano-copper. The results of the study demonstrate the beneficial effects of supplementing nano-copper on feed conversion ratio and immune-organ weight in the treated groups in broiler chicken. 15 g nanoparticle/litre of water is, therefore suggested to be used as an alternative to growth promoter on broiler chicken rations for higher productivity and profitability.

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