

The effects of different levels *Chlorella microalgae* on trace minerals concentrations of laying hens reared under heat stress

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Abstract

Introduction: Heat stress (HS) is involved in the poultry production industry, particularly in warmth regions of the world since of the resulting weak growth performance, immunosuppression and high mortality rate. *Chlorella* is unicellular green algae that contain essential amino acids, protein, minerals, vitamins, dietary fiber, and a great range of antioxidants, bioactive substances and chlorophylls. This study was conducted to investigate the effect of different levels supplementation *Chlorella microalgae* on serum minerals content of laying hens reared under heat stress condition (27.5-36.7°C; variable).

Methods: A total number of 378 (40 weeks age, with mean body weight of 1390±120 g) were randomly allocated to six treatments with seven replicates. The birds were randomly assigned to 6 treatments (C, T1, T2, T3, T4 and T5) with 7 replicate cages of 9 birds. *Chlorella microalgae* at the rates of 100, 200, 300, 400 and 500 ppm with water offered to groups T1, T2, T3, T4 and T5 respectively while group C served as control. At the end of experiment blood were taken for measuring serum minerals analysis (Zinc, Cobalt, Iodine, Copper, Iron, Manganese and Selenium).

Results: The results of this experiment showed that the supplementing of *Chlorella microalgae* have not significantly effect on concentrations of Zinc, Cobalt, Iodine and Copper ((P>0.05). *Chlorella microalgae* at rates 300-500 ppm caused a marked (P<0.05) increase in the serum content of manganese or Iron and selenium but other minerals were not statistically different among treatments.

Conclusion: Overall form the results of the present experiment it can be concluded that supplemental of *Chlorella microalgae* at high rate (500 ppm) was beneficial on blood parameters of laying hens reared under heat stress.

Keywords: *Chlorella microalgae*; Heat stress; Trace minerals; Laying hens