

PHYSIOLOGICAL STUDIES ON BROILER CHICKS UNDER HEAT STRESS CONDITIONS

By

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ABSTRACT

Ahmed Gouda Abd-Allah Abd-Allah: Physiological Studies On Broiler Chicks Under Heat Stress Conditions. Unpublished Ph.D Thesis, Department of Poultry Production, Faculty of Agriculture, Ain Shams University, 2015.

Two experiments were conducted to evaluate the effect of increasing dietary levels of organic chromium, organic selenium and Vitamin E and their interaction with early heat conditioning as means for alleviating the deleterious impacts of heat stress on broilers.

A total of 120 one day old commercial broiler chicks (Cobb) were used in the first experiment they were divided into four groups with six replications, each of five chicks. The first group was the control group; the other groups were fed the basal diet supplemented with organic Chromium (0.8 mg/kg diet), organic selenium (0.3 mg/kg diet) and vitamin E (200 IU/kg diet) for 2nd, 3rd and 4th groups respectively.

Results showed that increasing dietary levels of organic chromium, organic selenium and Vitamin E especially Vitamin E supplementation could improve the productive performance enhance blood parameters, total antibody titer against to Newcastle disease Virus (**NDV**), Insulin-like Growth factor -1 (IGF-1), antioxidant status, Heat shock protein 70 (HSP 70) and Carcass characteristics in heat stressed broiler chicks reared during the summer conditions.

The second experiment was conducted to study the possible benefits from the interaction between early age heat conditioning (5 d 40±1°C for 24h) and dietary supplements of the first experiment. A total of 240 one day old commercial broiler chicks (Cobb) were divided into two groups of 120 birds, each group was subdivided into 4 sub-groups of 30 birds, the first sub-group was the control group, the other sub-groups were fed the basal diet supplemented with (200

IU/kg diet vitamin E and 0.8 mg/kg diet organic Chromium), (200 IU/kg diet vitamin E and 0.3 mg/kg diet organic selenium) and (200 IU/kg diet vitamin E, 0.8 mg/kg diet organic Chromium and 0.3 mg/kg diet organic selenium), for 2nd, 3rd and 4th sub-groups respectively. At 5-d of age the first group was exposed to $40\pm1^{\circ}\text{C}$ for 24h (**Heat conditioning, HC**) while the second one was maintained under the normal brooding temperature ($32\pm1^{\circ}\text{C}$) (**Non heat conditioning, N.H.C**), At 42-d of age all groups were exposed to $41\pm1^{\circ}\text{C}$ for 1h.

Results showed that early age heat conditioning of broiler chicks and dietary supplements with (200 IU/kg diet vitamin E and 0.8 mg/kg diet organic Chromium), (200 IU/kg diet vitamin E and 0.3 mg/kg diet organic selenium) and (200 IU/kg diet vitamin E, 0.8 mg/kg diet organic Chromium and 0.3 mg/kg diet organic selenium) could improve the productive performance enhance blood parameters, total antibody titer against to Newcastle disease Virus (**NDV**), Insulin-like Growth factor -1 (IGF-1), antioxidant status, heat shock protein 70 (HSP 70) and carcass characteristics in heat stressed broiler chicks reared during the summer conditions.

It is suggested that early age heat conditioning accompanied with (Vit.E, Cr or Se) may be practically effective in enhancing the general performance of broiler chicks under heat stress conditions.

Key words: Broiler, performance, Blood, heat conditioning, Vitamin E, selenium, Chromium, Heat shock proteins and antioxidant status.

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