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Effects of L-tryptophan on diencephalic tryptophan hydroxylase gene expression in heat-stressed broilers

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Abstract

The brain monoaminergic system is changed during heat stress condition. Research has shown that commercial poultry are very sensitive animals to heat stress. Hence, this study investigated the effects of L-tryptophan on diencephalic tryptophan hydroxylase type 1 and 2 (TH1 and TH2) gene expression in heat-stressed broiler chicks as animal model. Forty eight, seven-day old broiler chicks were divided into three groups. Chicks were intraperitoneally injected L- tryptophan (25 and 50 mg/Kg) and normal saline. Then they were exposed to the heat stress (39ºC) for 5 hours. After 5 hours of treatment, the birds were anesthetized with isoflurane before being euthanized. The brain samples were taken for gene expression evaluation. The data showed declined diencephalic gene expression of TH1 and TH2 in heat stress condition. Tryptophan administration at dose of 50 mg/kg significantly increased the expression levels of TH1 and TH2 in heat stress exposed chicks. It can be concluded that diencephalic serotonergic pathway may have an important role in tryptophan ameliorating effect during heat stress condition.

Key words: Broiler, Diencephalon, High ambient temperature, Tryptophan hydroxylase

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