

Dietary supplementation of *Zingiber officinale* and *Zingiber zerumbet* to heat-stressed broiler chickens and its effect on heat shock protein 70 expression, blood parameters and body temperature

ABSTRACT

The present study was conducted to assess the effects of dietary supplementation of *Zingiber officinale* and *Zingiber zerumbet* and to heat-stressed broiler chickens on heat shock protein (HSP) 70 density, plasma corticosterone concentration (CORT), heterophil to lymphocyte ratio (HLR) and body temperature. Beginning from day 28, chicks were divided into five dietary groups: (i) basal diet (control), (ii) basal diet +1%*Z. zerumbet* powder (ZZ1%), (iii) basal diet +2%*Z. zerumbet* powder (ZZ2%), (iv) basal diet +1%*Z. officinale* powder (ZO1%) and (v) basal diet +2%*Z. officinale* powder (ZO2%). From day 35-42, heat stress was induced by exposing birds to $38\pm 1^{\circ}\text{C}$ and 80% RH for 2 h/day. Irrespective of diet, heat challenge elevated HSP70 expression, CORT and HLR on day 42. On day 42, following heat challenge, the ZZ1% birds showed lower body temperatures than those of control, ZO1% and ZO2%. Neither CORT nor HLR was significantly affected by diet. The ZO2% and ZZ2% diets enhanced HSP70 expression when compared to the control groups. We concluded that dietary supplementation of *Z. officinale* and *Z. zerumbet* powder may induce HSP70 reaction in broiler chickens exposed to heat stress.

Keyword: Zingiberaceae; Broiler chickens; Heat shock protein; Heat stress