

## **Effects of zinc oxide nanoparticles on regulatory appetite and heat stress protein genes in broiler chickens subjected to heat stress**

### **ABSTRACT**

This study was conducted to explore the effect of the zinc oxide nanoparticles (ZnONPs) supplement on the regulatory appetite and heat stress (HS) genes in broiler chickens raised under high or normal ambient temperatures. In this study, 240 one-day-old male broiler chicks (Cobb 500) were randomly assigned to 48 battery cages. From day 1, these 48 cages were randomly subjected to four different treatment strategies: Control (wherein, their basal diet included 60 mg/kg of ZnO), ZNONPs 40 (wherein basal diet included 40 mg/kg of ZnONPs), ZnONPs 60 (basal diet included 60 mg/kg of ZnONPs), and ZnONPs 100 (basal diet included 100 mg/kg of ZnONPs). Thereafter, from day 22 to 42, the chickens from each dietary treatment group were subjected to different temperature stresses either normal ( $23 \pm 1$  °C constant) or HS ( $34 \pm 1$  °C for 6 h/d), which divided them into eight different treatment groups. Our findings revealed that dietary ZnONPs altered the gene expression of cholecystokinin (ileum), heat stress proteins (HSP) 70 (jejunum and ileum), and HSP 90 (duodenum, jejunum, and ileum). The gene expression of ghrelin was affected by the interaction between the ZnONPs concentration and temperature in the duodenum and stomach. More studies are required to elucidate its complex physiological and biochemical functions of the regulation of gene expression within the intestine in heat-stressed broiler chickens.