

Effects of heat stress on growth performance, selected physiological and immunological parameters, caecal microflora, and meat quality in two broiler strains

ABSTRACT

Objective: This study was conducted to investigate the effects of normal and heat stress environments on growth performance and, selected physiological and immunological parameters, caecal microflora and meat quality in Cobb 500 and Ross 308 broilers. **Methods:** One-hundred-and-twenty male broiler chicks from each strain (one-day-old) were randomly assigned in groups of 10 to 24 battery cages. Ambient temperature on day (d) 1 was set at 32°C and gradually reduced to 23°C on d 21. From d 22 to 35, equal numbers of birds from each strain were exposed to a temperature of either 23°C throughout (normal) or 34°C for 6 h (heat stress). **Results:** From d 1 to 21, strain had no effect ($p>0.05$) on feed intake (FI), body weight gain (BWG), or the feed conversion ratio (FCR). Except for creatine kinase, no strain×temperature interactions were observed for all the parameters measured. Regardless of strain, heat exposure significantly ($p<0.05$) reduced FI and BWG (d 22 to 35 and 1 to 35), immunoglobulin Y (IgY) and IgM, while increased FCR (d 22 to 35 and 1 to 35) and serum levels of glucose and acute phase proteins (APPs). Regardless of temperature, the Ross 308 birds had significantly ($p<0.05$) lower IgA and higher finisher and overall BWG compared to Cobb 500. **Conclusion:** The present study suggests that the detrimental effects of heat stress are consistent across commercial broiler strains because there were no significant strain×temperature interactions for growth performance, serum APPs and immunoglobulin responses, meat quality, and caecal microflora population.

Keyword: Broiler chickens; Caecal microbiota; Ceruloplasmin; Heat exposure; Ovotransferrin; α 1-acid glycoprotein