

Changes in heat shock protein 70 expression and blood characteristics in transported broiler chickens as affected by housing and early age feed restriction

ABSTRACT

An experiment was conducted to determine the effects of 2 types of housing systems and early age feed restriction on heat shock protein (hsp) 70 expression and blood parameters in broiler chickens subjected to road transportation. On d 1, female chicks were housed either in windowless environmentally controlled chambers (temperature was set at 32°C on d 1 and gradually reduced to 23°C by d 21; CH) or in conventional open-sided houses (OH) with cyclic temperatures (minimum, 24°C; maximum, 34°C). Equal number of chicks from each housing system were subjected to either ad libitum feeding or 60% feed restriction on d 4, 5, and 6 (FR). On d 42, all of the birds were crated and transported for 6 h. Birds raised in OH had smaller increases in heterophil:lymphocyte ratios and plasma corticosterone concentrations than those of CH. Subjecting birds to FR dampened heterophil:lymphocyte ratios and corticosterone reactions to transportation. After 4 h of transportation, the OH birds had greater hsp 70 expression than their CH counterparts. Within the CH, the FR chicks showed higher hsp 70 density than those of the ad libitum-fed group. Except for glucose, housing system had a negligible effect on serum levels of cholesterol, potassium, and chloride. Collectively, the results suggest that the improved tolerance to transport stress in OH and FR chicks could be associated with better hsp 70 expression.

Keyword: transport stress, heat shock protein 70, housing feed restriction, broiler chicken