



Alteration of *HSF3* and *HSP70* mRNA expression in the tissues of two chicken breeds during acute heat stress

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ABSTRACT. This study aimed to estimate changes in *HSF3* and *HSP70* mRNA expression in stress-sensitive tissues of 2 chicken breeds during acute heat stress. Lingshan chickens (LSC) and White Recessive Rock (WRR) (24 chickens of each breed) were randomly divided into 4 groups (0, 2, 3, and 6 h of heat treatment). With increasing heat treatment time, both *HSF3* and *HSP70* expression first declined and then showed a significant increase in both breeds. However, *HSP70* expression decreased in the heart following 6 h of heat treatment, whereas *HSF3* expression continued to increase. After 2 h of heat treatment, *HSF3* expression was significantly higher in the brain and leg muscle of LSC compared to WRR ($P < 0.05$, $P < 0.01$). In comparison, *HSP70* expression was significantly higher in the liver and leg muscle of WRR

compared to LSC ($P < 0.01$, $P < 0.05$). After 3 h of heat treatment, *HSF3* expression was significantly higher in the brain and leg muscle of LSC compared to WRR ($P < 0.01$). In comparison, *HSP70* expression was significantly higher in the liver and heart of LSC compared to WRR ($P < 0.01$). These results indicate that the expression of *HSF3* and *HSP70* mRNA in LSC and WRR exhibit species-specific and tissue-specific differences during heat treatment.

Key words: Heat shock factor-3; Heat shock protein 70; Chicken; Heat treatment