

CONSTRUINDO SABERES, FORMANDO PESSOAS E TRANSFORMANDO A PRODUÇÃO ANIMAL

EXPRESSION OF GENES HSF1 AND HSPA6 IN TAURINE CATTLE SUBJECTED TO HEAT TOLERANCE TEST

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Identification of genes related to heat tolerance in bovine may allow advantageous selection of animals avoiding productivity decrease caused by heat stress. The aim of this study was to evaluate the physiological responses and expression of the heat shock factor 1 (HSF1) and heat shock protein family A member 6 (HSPA6) genes, related to heat stress response, in Angus (Ang) and Simmental (Sim) taurine breeds raised in a Brazilian subtropical climate. One hundred animals were classified by level of adaptation, according to an index based on the average of the respiratory rate obtained on two hot summer days. Of these, 30 bulls (n = 15 Ang and n = 15 Sim), eight "high adapted" and seven "less adapted" of each breed were selected to the heat tolerance test. In the day before the heat tolerance test day, animals were taken to a paddock with water, grass and shade until 7 a.m. of the following day for morning (M) measurements. The animals were then kept in the barn without access to water and shade until 1 p.m., when the afternoon (A) measurements were performed. Respiratory rate in the morning (MRR) and afternoon (ARR), surface temperature in the morning (MST) and afternoon (AST), rectal temperature in the morning (MRT) and afternoon (ART) were measured and blood samples were collected for expression analysis of the HSF1 and HSPA6 genes. The MIXED procedure of SAS (SAS Inst., Inc., Cary, NC) was used for all statistical analysis. There was interaction of breed and level of adaptation for MRR (P = 0.023) and MRT (P = 0.095). For Simmental, the less adapted animals had greater values of MRR; however, within the Angus breed there was no difference between high and less adapted. The high adapted Simmental group had lesser values of MRR and MRT. The ARR was greater (P = 0.004) in less adapted than in high adapted animals. The ART was lesser in the Simmental breed (P < 0.001). Less adapted had greater levels of mRNA of HSF1 (P = 0.06) and HSPA6 (P = 0.09) than high adapted animals. In conclusion, the physiological responses and expression of the HSF1 and HSPA6 genes increase in less adapted animals. The Simmental breed is better adapted to the heat tolerance test than the Angus breed.

Keywords: adaptability, angus, heat stress, simmental

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