

CONSTRUINDO SABERES, FORMANDO PESSOAS E TRANSFORMANDO A PRODUÇÃO ANIMAL

## EYE TEMPERATURE CHANGE ASSOCIATED WITH PHYSIOLOGICAL STRESS IN RESPONSE TO RACE TRAINING IN THOROUGHBRED HORSES

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Prolonged or intense exercise disturbs the body homeostasis, requiring neural and endocrine mediation in order to maintain the optimal condition for the cell function. Within seconds of perceiving a stressor, two systems are activated: the sympathetic nervous system (SNS), followed by stimulation of the hypothalamic–pituitary–adrenal axis (HPA), resulting in an increase in catecholamines and cortisol concentrations. The release of these hormones alters the blood flow responses and, consequently, changes the heat production and heat loss from the animal that can be detected by the infrared thermography. So, the goal of this study was to observe and describe the eye temperature change associated with physiological stress in response to a session of race training in thoroughbred horses. Thermal images were taken from the left eye of 13 two-year-old thoroughbred horses before and after the last training day before their first official race. The training session at the experimental day lasted for 20 minutes and was characterized by 900 meters of trot and 1000 meters of fast gallop. The temperature and the relative humidity of the air were recorded by a datalogger and those data were used to assess environmental conditions by calculating the Comfort Index (CI) as shown in equation:  $CI = T_{air} (°F) + RH (\%)$ . The experiment was performed under a total randomized design with 13 replications. The analysis of changes in maximal eye temperature was done with an ANOVA procedure and a correlation between the maximal eye temperature, respiratory rate and Comfort Index was investigated. There was a significant increase ( $P < 0.01$ ) in the eye temperature measurements taken after the training session. There was a positive linear correlation between the respiratory rate and the maximal eye temperatures reinforcing the theory that the catecholamines are involved in the stimulation of respiration rate and also promotes the redistribution of blood flow during stressful situations. A correlation between the Comfort Index and the maximal eye temperatures was not found. This result may be due to the fact that the animals were brought to the washing box during the image collection in order to protect them from direct exposure to the environmental conditions. Therefore, the infrared thermography is a versatile, non-invasive and high sensitive technology that is able to effectively measure the eye temperature change, which consists in a useful parameter to measure stress levels in thoroughbred horses during race training.

**Keywords:** equine, exercise, infrared thermography, welfare

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