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THERMAL REGULATION IN HORSES SUBMITTED TO EXERCISE AT DIFFERENT TIMES OF THE DAY

TERMORREGULAÇÃO EM EQUINOS SUBMETIDOS A EXERCÍCIO EM DIFERENTES PERÍODOS DO DIA

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It is evident the necessity of a better understanding regarding the influence of warmth on the performance of horses in training, establishing that an efficient thermoregulation is essential to provide the physiological demands resulting from effort required and the climatic variables which the animal is exposed. This study aimed to evaluate thermoregulation in horses subjected to 30 minutes of exercise during three periods of the day with different air temperatures and to compare two techniques for measuring the sweating rate (SR) and trans epidermal water loss (TEWL). Three castrated crossbred horses were submitted to a series of half an hour of exercise at different moments (07:00, 13:00, 16:00 hours), carried out as follows: 3 minutes walking, 3 minutes of canter, 10 minutes of trot, 10 minutes of canter, 2 minutes of trot and 2 minutes of canter. Relative humidity, black globe and air temperature were 50%, 34C° and 20.8°C; 62%, 35°C and 28.8C°; 48%, 34.5C° and 27.4C°; respectively for the three periods. Rectal temperature (RT), respiratory rate (RR), body surface temperature (BST), SR through the methodology of Schleger and Turner (1965) and TEWL measured by VapoMeter (Delfin, Finland) were taken before and after exercise. Model for analysis of variance included fixed effects of time and moments, and the means were compared by Tukey test or T at 5% of significance. Significant differences were observed between all variables at all time of samplings, except for the values of BST and TEWL at 13:00 hours. Regarding time of the day, significant differences were observed after exercise in variables RR, RT and BST, and also differences in the BST between the three periods before exercise. In this context, the time of day and weather can influence the thermoregulation. The use of VapoMeter was easier because it was faster and did not have external influences of relative humidity, however, it is necessary to carry out more researches to validate this equipment to horses.

Table 1. Least square means and standard error of respiratory rate (RR), rectal temperature (RT), body surface temperature (BST), trans epidermal water loss (TEWL) and sweating rate (SR) of horses before and after exercise routine at three different times of the day

Variable/time	Moments	07:00	13:00	16:00
RR (mov/min)	Before	18.67 ± 1.33*	20 ± 0*	22.67 ± 4.81*
	After	86.67 ± 17.63 ab*	73.33 ± 15.37 b*	140 ± 9.24[A]*
RT (°C)	Before	37 ± 0*	37.07 ± 0.22*	37.13 ± 0.17*
	After	40.4 ± 0.30 a*	38.93 ± 0.09 b*	41.03 ± 0.15 a*
BST (°C)	Before	27.03 ± 0.28 c*	34.23 ± 0.75 a	32.93 ± 0.44 b*
	After	35.67 ± 0.09 b*	36.23 ± 0.14 a	37.67 ± 0 a*
TEWL (g/m²/h)	Before	67.6 ± 9.32 a*	300.33 ± 74.11 a	264.67 ± 41.38 a*
	After	518 ± 41.49 a*	409 ± 2 a	479 ± 6.56 a*
SR (g/m²/h)	Before	122.75 ± 37.36 a*	233.63 ± 26.91 a*	121.18 ± 4.9 a*
	After	3037.47 ± 1362.48*	3503.85 ± 201.62*	1674.68 ± 130.23*

Means in the same row followed by different letters differ by Tukey test (P<=0.05). Means followed by * in the same column differ by Test T (P<=0.05) for each variable.

Keywords: effort, performance, weather.