

Feeble Weekly Rhythmicity in Hematological, Cardiovascular, and Thermal Parameters in the Horse

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ABSTRACT

The homeostatic control of physiological processes is affected by a variety of temporal programs, such as circadian rhythms, estrous cycles, and circannual rhythms. The existence of circaseptan rhythms (endogenous rhythms with the duration of a week) has been postulated but not properly verified. In this study, we compared plasma concentration of lactic acid, systolic and diastolic blood pressure, and rectal temperature in athletic horses (maintained under a weekly training schedule) with those in sedentary horses (maintained under a constant schedule throughout the week). Although exercise had robust acute effects on the measured parameters, measurements conducted early in the morning or in the evening showed significant weekly rhythmicity only in one of the parameters (plasma concentration of lactic acid) in a few animals. This rhythmicity was feeble, was present only in athletic horses, and vanished if rigorous statistical criteria were applied. In contrast, 24h rhythmicity was significant in all parameters in all horses. We conclude that the overall 7-day pattern in physiological parameters of the horse is feeble and is caused by the weekly

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