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Veterinari Medicina

Assessment of anaerobic threshold in the galloper using a standardised exercise field test

G. Piccione, A. Assenza, F. Fazio, M. Percipalle, G. Caola

Veterinari Medicina, 49 (2004): 291-297

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In this study an incremental load triangular exercise test has been performed on 20 Gallopers, divided into two groups, A and B, and the test has been customised to the two groups according to age and sex. The subjects being tested, after a 10 minutes warm-up, have undergone an incremental three workloads exercise test. All steps lasted for three minutes and were separated by 1 minute intervals (incremental loads triangular exercise test). The workload for each phase of the test has been set as follows: group A, speed of 400, 500 and 600 m/min over a distance of 1 200, 1 500 and 1 800 m; group B, speed of 500, 600 and 700 m/min over a distance of 1 500, 1 800 and 2 100 m. Each horse had a heart rate monitor for the assessment of the heart rate mean value at each phase. At rest, after warm up, and at the end of each phase, 30 and 45 minutes after the end of the test, all subjects underwent a

blood test by means of an external jugular venipuncture for the immediate assessment of lactate on whole blood with a portable blood lactate analyser. For each horse the following physical attitude parameters have been calculated: VLa₂, VLa₄, V₂₀₀, HR₂, HR₄. The highly significant correlation between heart rate and speed during the test has shown a linear increment for group A ($r = 0.94$; $p < 0.01$) and for group B ($r = 0.87$; $p < 0.01$), while the incremental trend of blood lactate as related to speed is exponentially correlated for group A ($r = 0.84$; $p < 0.01$) and for group B ($r = 0.85$; $p < 0.01$). The following differences are of statistical significance: V₂₀₀ of group A compared to V₂₀₀ of group B ($p < 0.01$); La₁ of group A compared to La₁ of group B ($p < 0.01$); La_{R30} of group A compared to La_{R30} of group B ($p < 0.05$). V₂₀₀ represents the horse's cardiac power, thus it is possible that adult subjects, as 4 years (and older) horses, have perfectly developed the efficiency of the cardiac pump. Furthermore the galloper in its effort draws from the anaerobic metabolism which starts timely and to a significantly higher extent in older

efficiency of this metabolic pathway during exercise in these subjects. This could be indicative of the type of training done by the galloper. The results are discussed on the base of a possible use of a triangular exercise test on track for the functional assessment of the galloper.

Keywords:

exercise; anaerobic threshold; standardised test; blood lactate; heart rate; galloper

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