

Energy Expenditure of Polocrosse Horses Using Field Studies of Heart Rate

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Polocrosse is a game of four periods (chukkas) of approximately 8 minutes each. A team consists of two groups of three horses, which play in either chukkas 1 and 3, or 2 and 4. Horses play in Position 1 (attack), Position 2 (centre) or Position 3 (defence). The game imposes constantly changing exercise intensities, as galloping is interrupted by stopping and turning, and rough contact between horses. This type of exercise probably generates high energy expenditures and cardiovascular stress, but these have not been measured.

Heart rates were measured on 26 occasions (over five carnivals and six horses) during the SE Queensland Zone inter-club carnivals and the Queensland Championships. The horses were mature Australian Stock Horses, Thoroughbreds, or their crosses. The weight of horses plus rider and tack could not be measured but was estimated to be 520 to 620 kg. Data were recorded for two chukkas and the intervening recovery period, using an integrated heart rate monitor and global positioning system (E-TRAKKA; Equitronics Pty Ltd., Perth). Energy expenditure was calculated from a relationship between heart rate and Vo_2 (Coenen 2005). Step-wise analysis of variance (GLM algorithm) and step-wise multiple regression methods were used to test the effects of horse, position in the game, chukka, and carnival on the calculated energy expenditure.

During play, the maximum heart rate recorded was 224 bpm (sustained for 6 sec.); mean heart rates varied from 119 to 150 bpm. There was no difference in mean heart rate between the 2 chukkas played by each horse. The horses in this study used an average of 0.55 ± 0.124 MJ NE/min. (mean \pm SE), with one horse using 22 MJ NE in a game of two chukkas and the intervening recovery period (overall mean 5.3 ± 2.70 MJ). Energy expenditure was similar in the first (0.8 MJ NE/min.) and the second (0.7 MJ NE/min.) chukka played. Horses playing in Position 1 tended to have higher ($P < 0.1$) rates of energy expenditure (0.63 MJ NE/min) than horses playing in Position 2 (0.48 MJ/min.) or Position 3 (0.54 MJ/min.).

Maximum and average heart rates were very similar to those recorded with polo horses (Marlin and Allen 1999). Similar mean heart rates between chukkas implies that play in the second chukka does not impose higher cardiovascular stress than the first chukka, but the rate of energy expenditure varies according to position played. Polocrosse imposes considerable energy demands, and the energy used by polocrosse horses playing two games per day is equivalent to about 1.9 times the maintenance energy requirement. This energy expenditure is similar to the "very heavy work" category of NRC (2007). Training and conditioning regimes for polocrosse horses should be tailored to the specific requirements of the game and the position played.

Coenen, M. (2005). Proc. 19th Equine Sci. Soc. Conf., Tuscon, AZ. p. 123.

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