

Rider energy expenditure during high intensity horse activity and the potential for health benefits

O'Reilly CL¹, Sigler DH¹, Fluckey JD², Vogelsang MM¹, and Sawyer JE¹

¹Department of Animal Science; Texas A&M University; College Station, TX

²Department of Health and Kinesiology; Texas A&M University; College Station, TX

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Advisor / Mentor: Sigler DH (dsigler@tamu.edu)

ABSTRACT

Obesity and disease associated with sedentary lifestyles have become major concerns in the United States. Exercise has been described as a crucial part of disease prevention and overall health, with activities such as biking or running cited as examples. Horseback riding is a popular activity; however, little information on the exercise value of horseback riding exists. The objective of this experiment was to define the energy expenditure of participants in several common riding events. All procedures were approved by the Texas A&M Institutional Review Board and Institutional Animal Care and Use Committee; subjects gave written consent prior to participation. Twenty subjects completed each of three riding tests: a 45min walk-trot-canter ride (WTC), a reining pattern, and a cutting pattern while wearing a telemetric gas analyzer. Anthropometric data were obtained for each subject through DEXA scans. Total energy expenditure (tEE), as well as mean and peak energy expenditure per minute (EE/min), metabolic equivalents of task (MET), heart rate (HR), respiratory frequency (RF), pulmonary ventilation (VE), oxygen consumption (VO₂), relative oxygen consumption (relVO₂) and carbon dioxide production (VCO₂) were measured. Mean energy expenditure per minute, and HR responses were greater ($P < 0.05$) for reining (6.96 ± 0.23 Kcal/min, 163.28 ± 4.2 bpm) and cutting (4.98 ± 0.23 Kcal/min, 146.9 ± 4.2 bpm) than for WTC (4.27 ± 0.23 Kcal/min, 131.5 ± 4.2 bpm). When WTC test was evaluated by gait component, mean EE/min and MET increased as gait speed increased. Mean EE/min and MET were higher ($P < 0.05$) for riders at long trot (6.9 ± 0.21 Kcal/min, 6.19 ± 0.21 MET) and canter (6.93 ± 0.21 Kcal/min, 5.95 ± 0.21 MET) gaits than during the walk (2.34 ± 0.21 Kcal/min, 2.01 ± 0.21 MET) or trot (3.5 ± 0.21 Kcal/min, 3.2 ± 0.21 MET) gaits. Similar patterns were observed for RF, VE, VO₂, VCO₂ and RelVO₂ across disciplines and by gait component. The tEE (194.7 ± 3.84 kcal/min) and mean MET (4.27 ± 0.23 MET) observed during the 45-min WTC ride were within current national recommendations of intensity (3-6MET), time (>30min) and calories burned (~1000Kcal/wk). The results of this study provide novel information about exercise intensity values for horseback activities and differences among riding disciplines measured in real time using a portable system. Riders engaged in cutting and reining experienced more intense exercise in short durations, while WTC provided a greater total energy expenditure. These data suggest that it is possible, if riding at the more intense gaits such as long trot and canter, for health benefits to be achieved through accumulated weekly horseback riding exercise.