

Effect of diet on the
metabolic response
to exercise in
Thoroughbred horses
with recurrent exertional
rhabdomyolysis (RER).

MacLeay JM², SJ Valberg², JD Pagan¹,
J Billstrom² and J Roberts². 1998.

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Utsunomiya, Japan (In press).

Purpose

The purpose of this study was to investigate the effect of diet on changes in serum creatine kinase (CK), plasma lactate, muscle lactate, and muscle glycogen concentrations with near-maximal exercise.

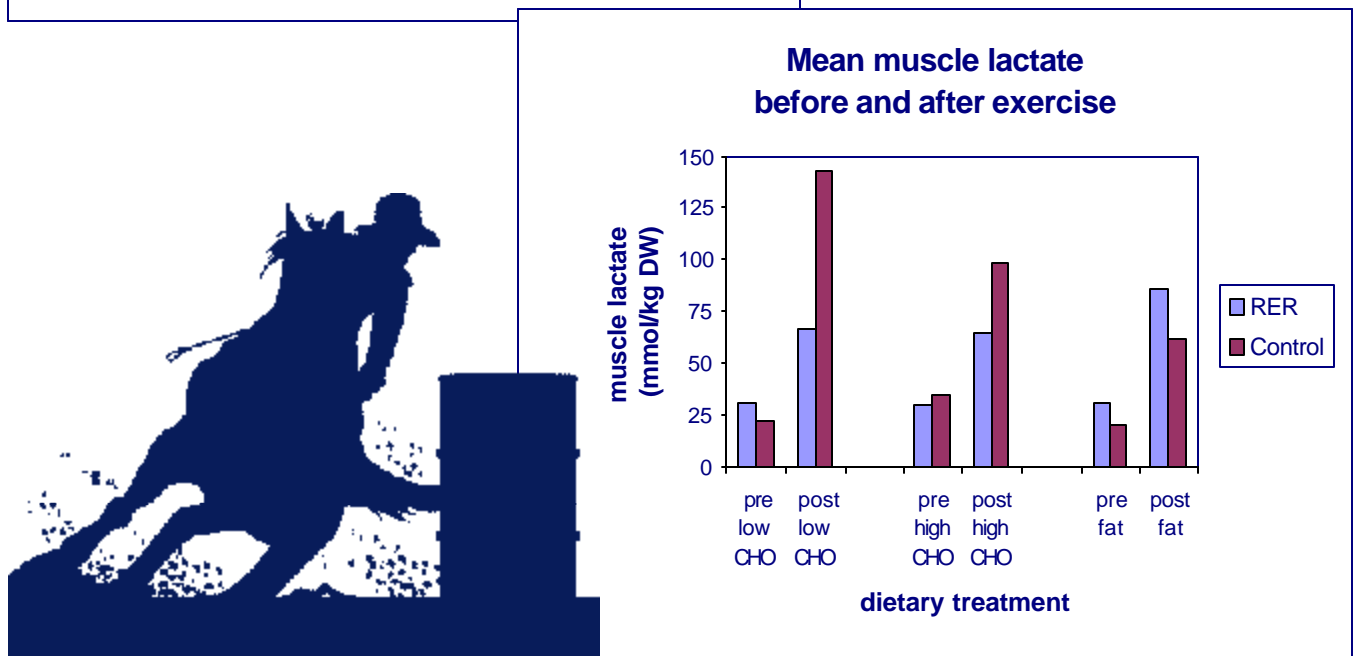
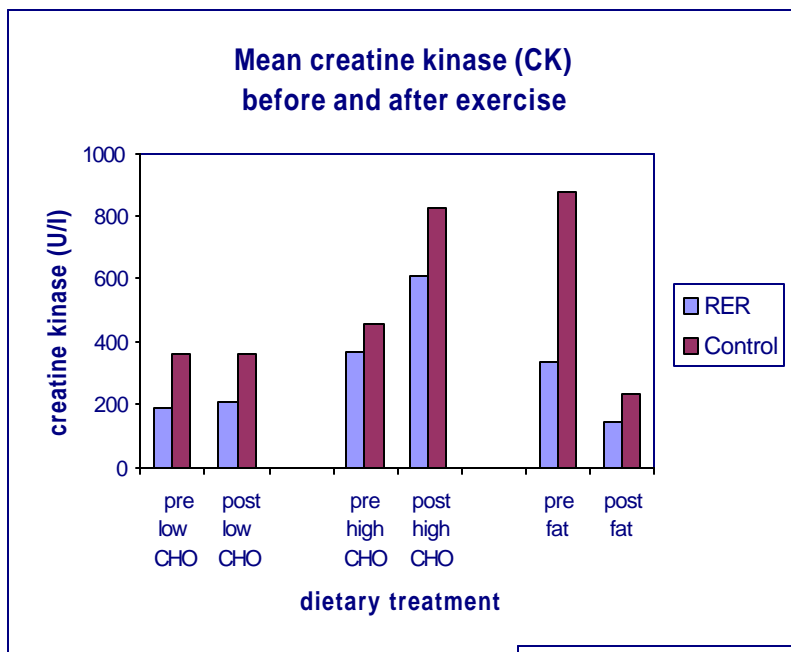
The experimental diets were composed of adequate amounts of soluble carbohydrate or fat, or excessive soluble carbohydrate.



Results

Mean creatine kinase (CK) activity post-exercise on the high carbohydrate diet was 1.5 times greater than the fat and low carbohydrate diet, but this was not significantly different. The changes in plasma lactate and muscle lactate after exercise were significantly higher on the fat diet than the low carbohydrate or high carbohydrate diet.

Post-exercise muscle lactates were 1.5 times higher on the fat diet than on the low carbohydrate or high carbohydrate diet. No significant differences in muscle glycogen were seen between diets.



Implications

This study shows diet has a significant effect on muscle metabolism even when fed for a three week period. CK activity was lowest in Thoroughbred horses susceptible to RER when fed a diet formulated to meet, but not exceed, daily energy requirements using either soluble carbohydrates or fat. The fat diet resulted in higher muscle lactate concentrations in RER horses, though no associated increase in CK was observed.

