

Time of feeding and fat supplementation affect exercise response in Thoroughbred horses.

Duren SE¹, JD Pagan¹, PA Harris²
and KG Crandell¹. 1998.

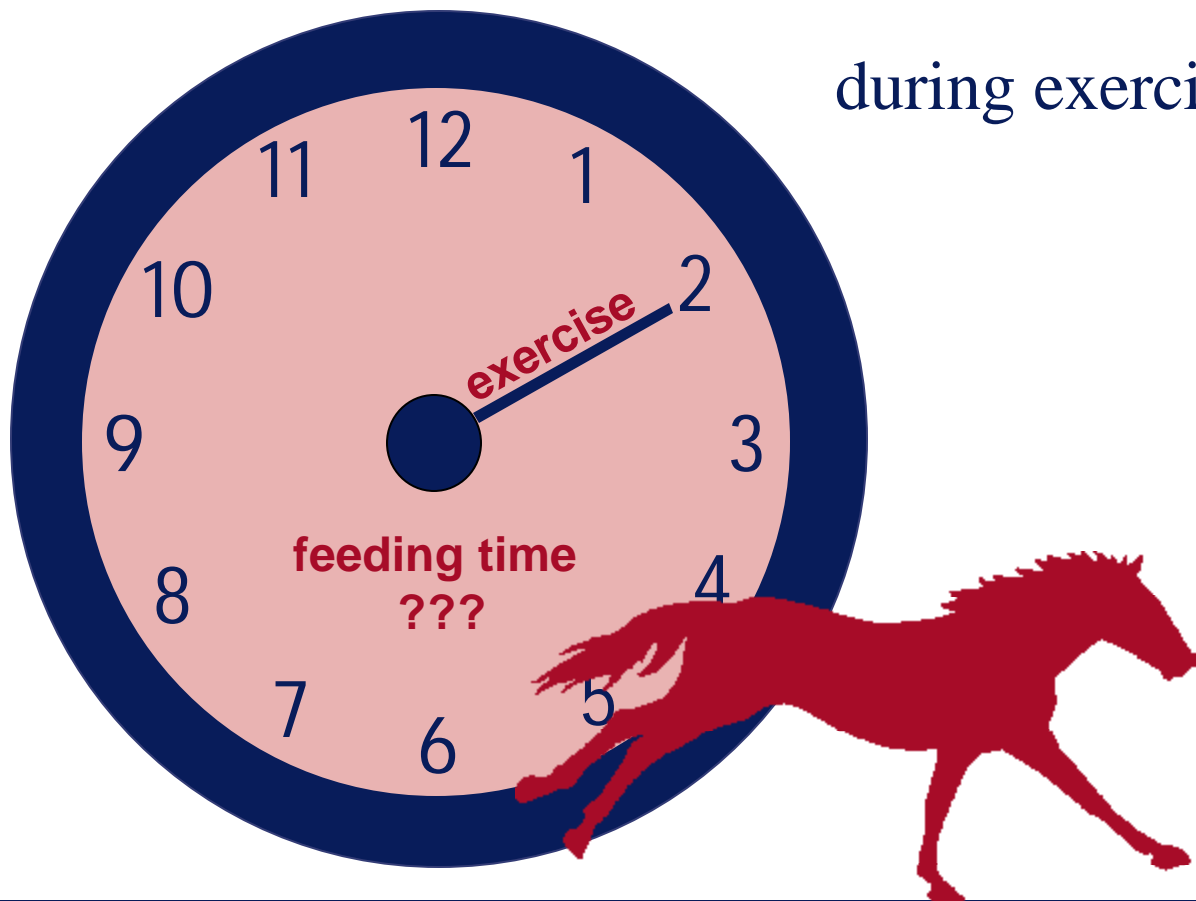
¹Kentucky Equine Research Inc., Versailles, KY

²Waltham Centre for Pet Nutrition, UK

Proc. 5th International Conference
on Equine Exercise Physiology,
Utsunomiya, Japan (In press).

Purpose

The objectives of this study were to further define the impact of feeding prior to exercise and to determine if replacing a portion of the carbohydrate from a typical performance horse diet with fat would alter hormone and substrate concentrations during exercise.



Results

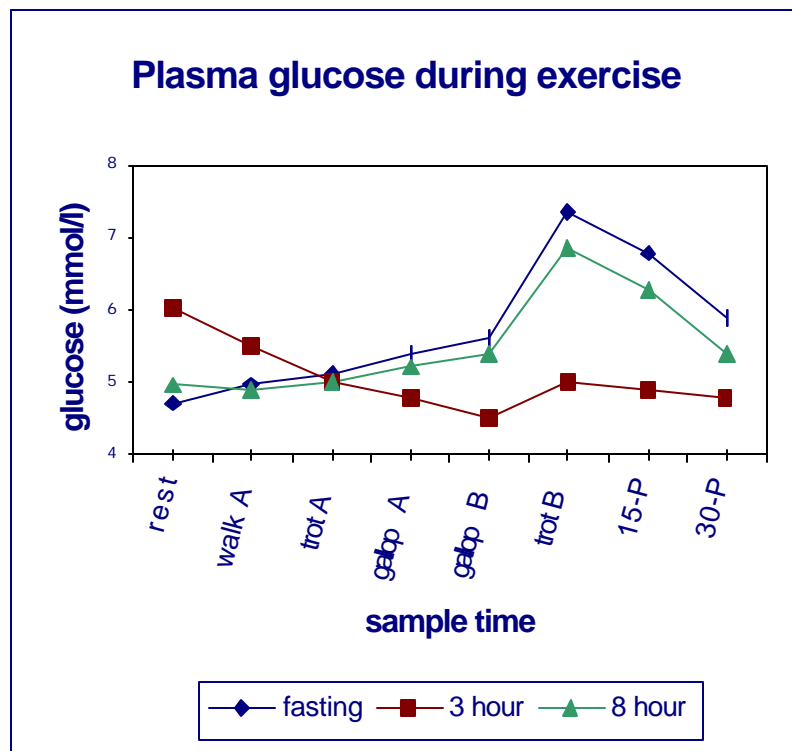
Time of feeding influenced plasma glucose concentrations during exercise. Blood glucose dropped in the horses fed three hours before exercise and was significantly lower during and after the 11.0 m/s gallop. Fat supplementation affected plasma glucose concentrations post-exercise. Plasma glucose concentrations were higher post-exercise for fat-supplemented horses compared with control horses.

Horses that were fed three hours prior to exercise tended to have higher heart rates compared to the 8-hour postprandial and fasted horses. During the warm-up walk, fat-supplemented horses had lower heart rates.

Plasma lactate increased with exercise intensity but was not affected by dietary treatment. Time of feeding did not influence lactate concentration during exercise.

Insulin was significantly higher in the 3-hour fed horses at the beginning of and throughout exercise.

Insulin was significantly higher in the 3-hour fed horses at the beginning of and throughout exercise. Insulin was lower in the fat supplemented horses following the warm-up ($p < .05$) and during exercise ($p < .10$).



Implications

Results from this study and from other studies that have investigated pre-exercise feeding indicate that time of feeding has an influence on circulating blood metabolites available for use during exercise. Providing a textured feed 3 h prior to exercise may be beneficial but is subject to interpretation. On one hand, starting exercise with high plasma glucose concentration may be viewed as a readily available energy source. However,



the potential of hyperinsulinemia to negatively influence plasma concentrations of nutrients and hormones appears to outweigh the potential benefit of feeding horses three hours prior to exercise.