

Timing of Meals May Affect Performance

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Looking for that edge that might make your horse run faster, jump higher, or perform longer? Recent research done by the scientists at Kentucky Equine Research (KER) might provide an answer.

In a study titled “Time of Feeding Critical For Performance,” Dr. Joe D. Pagan and the staff at KER designed two trials: one to determine whether feeding grain with or without hay prior to a competition exercise test (CET) would affect substrate utilization (how a horse uses fuel); and a second to determine whether feeding forage but no grain prior to a CET would affect substrate utilization and performance. The first trial examined feeding hay, grain, or both at four different times prior to exercise, and the second trial investigated feeding only forages at four different times. The results may provide the edge that will put your horse over the top.

Competition exercise tests are designed to simulate the demands placed on horses during strenuous activity. The two studies KER designed utilized the high-speed treadmill to exercise the horses and to enable researchers to draw blood from the horses while they were working at various speeds. Using information obtained from studying the plasma, the researchers hoped to find how different feeds and time of feeding would effect the horses and their performance. Plasma variables are the key indicators as to how the body performs and copes with the physiological stresses presented during exercise. Blood samples were taken during the last 30 seconds of each speed. These samples could only be obtained through the accessibility of the animal on the treadmill. Researchers can stand literally right beside the horse as it is exercising and are able to draw blood without interrupting the horse’s rate of speed. A CET was designed to simulate the conditions of a three-day event, as time of feeding is particularly important to the event horse. The treadmill was raised to an incline of 3° and the horses were asked to exercise as shown in Table 1.

Performing the trials using the treadmill provided a stable environment that remained constant for each horse during each period. This ensured the accuracy of the data recorded so that it could be accurately examined and valid information could be obtained.

GAIT	TIME	SPEED	PHASE
Walk	10 min	1.4 m/s	A
Trot	10 min	3.7 m/s	A
Gallop	2 min	10.7 m/s	B
Trot	20 min	3.7 m/s	C
Walk	10 min	1.4 m/s	C
Canter	8 min	9.0 m/s	D
Hand Walk	30 min	---	Warm down

Table 1.

The results from the studies indicated that feeding hay with grain would increase gut fill and thus increase body weight, which is detrimental to racing. However, raising the level of gut fill is associated with additional volume of water and electrolyte reservoir in the hindgut, which is advantageous to endurance riding. So, for a racehorse it would be wise to feed early enough in the day to enable the horse’s system to eliminate most of the feed, but an endurance horse would do better when its feed was delivered closer to the time of competition.

If a horse is fed grain two hours before competition, the horse will metabolize sugars rather than free fatty acids (FFA). The sugar fuel store depletes much more quickly than the fat fuel store, so for prolonged competition such as an endurance event or the endurance phase of a three-day event, it is recommended to encourage FFA metabolism. The horse’s sugar levels will have returned to baseline before the start of the competition, and the fat stores will become more accessible as a fuel source.

As equine performance continues to become increasingly more competitive, it is crucial that horses have access to fuel at the instant of demand. This maintains excellent performance, ensures the integrity of the horse’s physical being, and also promotes the safety of both horse and rider. 