

# **Dietary manipulation of rations for horses with Recurrent Exertional Rhabdomyolysis (Tying Up)**

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Recurrent Exertional Rhabdomyolysis (RER), commonly referred to as “Tying Up” is a condition which is most frequently seen in fit young fillies with very nervous temperaments. It affects about 5% of racing Thoroughbreds and episodes of RER tend to increase in frequency as the degree of fitness increases. Resting serum CK activity in RER horses is usually normal unless a recent episode of rhabdomyolysis has occurred. *Lack of routine daily exercise and a diet high in starch are predisposing factors for episodes of tying up.*

## **Nutrition and Tying Up**

In recent years, dietary fat supplementation has been advocated for chronic exertional rhabdomyolysis as a convenient and effective method of control.

Dietary fat has become a popular means of providing a highly digestible and dense energy source for horses. Proposed advantages of fat supplementation include:

- Decreased use of energy for heat production
- Enhanced performance
- Alterations in skeletal muscle metabolism with exercise
- Decreased feed and water requirements
- Calmer temperament
- Improved body condition and hair coat

Standard equine diets are generally very low in fat, usually containing only 2-3% fat by weight, and high in nonstructural carbohydrates. Several studies have been conducted which describe a reduced incidence of tying up in horses on high fat/low carbohydrate rations:

- Following an adaptation period of 3 – 6 months, 16 out of 19 horses prone to tying up did not have any episodes following a diet change from high carbohydrate/low fat to low carbohydrate/high fat (Valentine et al., 1998).
- Post exercise serum CK activity was significantly elevated (>3000U/l) when horses consumed a high starch diet but was within normal range (<400U/l) when they consumed a low starch/high fat diet (MacLeay et al., 2000).
- A high-fat, low-starch diet resulted in dramatically lower postexercise CK activity in severely affected RER horses compared to a low-fat, high-starch diet without measurably altering muscle lactate and glycogen concentrations (McKenzie et al., 2003).

## **Fat sources**

The major fat sources in horse diets are the vegetable oils (e.g. corn oil, canola oil, plus other manufactured products from the various feed companies: Performa 3, Racing Oil, Energy Gold etc). Oil is energy dense and cheap but has the disadvantages of being messy, unpalatable to some horses, prone to rancidity in warm temperature and difficult to feed in large amounts. Other fat sources include rice bran products (e.g. Equi-Jewel which is 18% fat) and other high fat premixes (e.g. Mitavite Formula 3 which is 12% fat). Additional Vitamin E (600-6000IU/day) should be added to diets containing a large amount of oil as fat.

## **How much fat to feed?**

Thoroughbreds with frequent episodes of rhabdomyolysis are usually being fed 2.2 – 6.8kg of sweet feed per day. Fat supplementation without complete elimination of starch containing feeds is appropriate for horses who tie-up. This type of high energy diet can also be provided through a combination of grains (no more than 2.2kg sweet feed/day) and fats such as vegetable oil (up to 600ml per day), rice bran (up to 2.2kg per day) or other commercially available fat supplements and highly fermentable fibre sources (soy hulls, such as Prydes Easisport).

There is some evidence to suggest that detrimental effects may occur when feeding a very high dietary fat intake 25-30% of daily dietary energy, which is the equivalent of about 1.1L oil for intense work. Feeding unnecessarily high dietary fat may induce loose manure, decreased digestibility of other dietary components due to depression of activity by cellulytic bacteria decreased dry matter intake and obesity.



## **Expectations of fat supplementation**

The time required for improvement in signs of exertional rhabdomyolysis is controversial. It has been suggested that a minimum of 4 months of supplementation is required and that relapses are associated primarily with disruption of supplementation. However, recent findings showed that significant reduction or normalization of post-exercise serum CK activity can occur within 1 week of commencing a diet providing 20% of digestible energy as fat and 9% digestible energy as starch.

## **Additional management strategies**

The change in diet will only be effective providing an appropriate exercise routine and other management strategies are in place.

Stable confinement should be kept to less than 24 hours if possible. Because RER appears to be a stress-related disorder, management strategies to reduce stress and excitability in these horses are important. These include turning horses out, exercising or feeding these horses first before other horses and providing compatible equine company (judicious use of calming agents is sometimes employed).

Supplemental feeds should be reduced in amount on days when energy requirements are not as high, particularly if the horse is at risk of weight gain. Other management strategies which may help include feeding small meals, providing at least 1.5% of body weight as roughage, and feeding a roughage source either 2 hours before or concurrently with any grain. Avoiding high starch supplements such as molasses is also important. Electrolyte, Vitamin E and B Group Vitamin supplementation may also be useful.

## **References**

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