

## All Tied Up

Do you know the causes of “tying-up” in horses? Our consulting nutritionist and internationally renowned researcher tells us what to look for – and how to prevent – this muscle problem in horses.

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Tying-up is a major concern to many horse owners and trainers. Although most horse owners identify tying-up with a specific problem with which they have experienced, the term tying-up covers a number of problems that have a diversity of causes. Tying-up, or exertional rhabdomyolysis, is characterized by moderate to severe muscle cramping. Signs of the condition vary from mild stiffness following a training session to complete inability to move or stand. The animal with a severe case usually perspires heavily, will have elevated heart and respiratory rate and will likely urinate dark, brownish-colored urine. Care must be taken to separate tying-up from muscle strains and fatigue. The condition might be a single, acute reaction or it could be a chronic condition that occurs at predictable intervals. Until recently, it was thought that tying-up incidents all had the same cause. Research in the past 10 years has provided evidence that there are several forms of tying-up and several causes. Tying Up

### Monday Morning Disease

The classic “Monday Morning Disease” has been recognized for almost 100 years. Historically, this so-called disease occurred in horses that pulled milk wagons six days per week but got Sundays off. When the horses were put back to work on Mondays, they developed tying-up or what became known as Monday Morning Disease. This condition also occurs in other horses in training and is the result of the horses being fed too much concentrate on their day off. It can occur in a young racehorse in training or in a performance horse that spends 24 hours in a trailer between shows. It appears that this condition is due to the buildup of excess glycogen in the muscle. Glycogen is the storage form of glucose that provides the animal with energy to fuel its activity. The horse gets glycogen from starch found primarily in feed grains in the concentrate.

To minimize this problem, reduce concentrate intake on the days that the animal is not exercised. Using a low-starch concentrate, such as Spillers/ Seminole Hdf pellets, will also help.

### Chronic Tying-Up

The second type of tying-up that occurs in the horse is a more chronic condition, taking place in highly trained horses performing in endurance and other strenuous events. This condition is most likely due to fatigue, dehydration and electrolyte loss or nutrient imbalance. It is typified by

stiffness, muscle cramps, profuse sweating and sometimes diaphragmatic flutter. It might occur once and after successful treatment not reoccur. Or, it can come back at regular or irregular intervals.

Provide the horse with adequate electrolytes during or immediately following exercise to minimize this problem. Keep the nutrient intake balanced by feeding a concentrate designed for the animal's activity and the forage program. Reoccurring episodes should be considered a sign that further investigation of the cause is needed.

### Genetic Fault

There are several genetic causes of tying-up. The most common of these is polysaccharide storage myopathy (PSSM). This condition causes the animal to store glucose in the muscle in a form that prevents it from being mobilized. The animal cannot utilize glycogen and therefore must not consume glucose (starch). Animals with this condition must be supported by forages, non-starch by-product ingredients such as beet pulp and soybean hulls and fat. PSSM is most common in Quarter Horses and breeds that cross with Quarter Horses such as Paints and Appaloosas. PSSM is inherited as an autosomal recessive trait. Equine polysaccharide storage myopathy (EPSM) is a similar condition except that weakness seems to be common with this problem. It occurs in draft horses and their crosses. Recurrent exertional rhabdomyolysis (RER) occurs in Thoroughbred racehorses and seems to be due to aberrant calcium metabolism. RER appears to be an inherited condition. It is managed by reducing stress, reducing high-starch concentrates, increasing forage intake and increasing fat intake. A fourth condition, called glycogen branching enzyme deficiency (GBED), occurs in newborn foals and is evident within 10 days of age. The foals lack the enzyme necessary to store glycogen in its branched form. It is usually fatal because the foal cannot mobilize the glycogen in the muscle for its needed energy. The mechanism by which it is inherited is still under investigation.

Tying-up is a condition that for the most part can be managed so that its occurrence can be minimized in most animals. It does take some understanding of the causes and the alternatives in feeding and management programs necessary to keep it under control.

### Low-Starch Alternatives

Dr. Ott's findings reveal that a low-starch diet is helpful for horses suffering from "tying-up." Minimize your horse's chances of tying-up by utilizing these low-starch commercial feed products.

- Spillers/Seminole Hdf pellets

- Spillers/Seminole Horse & Pony pellets
- Spillers/Seminole Happy Hoof
- Spillers/Seminole Showing Chaff

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