

# Questions & Answers

BY DR. STEPHEN DUREN, KENTUCKY EQUINE RESEARCH, INC.

**Q** My horse recently had a tying-up episode. What causes this condition and how can I prevent it from happening again?

**A** The term “tying-up” is used to describe horses that develop rigid hip and back muscles and the inability to move after exercise. Other terms for this syndrome include azoturia, Monday morning disease, exertional rhabdomyolysis and chronic intermittent rhabdomyolysis. Indications that a horse is “tying-up” range in severity from mild stiffness following exercise to the inability to stand. During exercise, horses develop a short, stiff stride, sweat profusely and have elevated respiration rates. A diagnosis is made on the basis of muscle cramping, stiffness, and elevations in serum muscle enzymes - creatine kinase (CK), lactate dehydrogenase (LDH) and aspartate aminotransferase (AST).

The possible causes of tying-up are currently getting research attention. Tying-up is thought to be a sign of many different muscle problems. Several causes have been proposed, including dehydration, electrolyte imbalances, hormonal imbalances, lactic acidosis, vitamin E and selenium deficiency, inability to properly regulate intracellular calcium and muscle sugar (glycogen) storage disorders.

Treatment and/or prevention tips that may help a horse predisposed to tying-up include minimization of stress, daily (non-strenuous) exercise, balanced vitamin and mineral supplementation, minimization of carbohydrate (grain) intake and maximization of fiber (grass hay) and dietary fat (corn oil, rice bran) supplementation. You should work closely with your veterinarian and nutritionist to help minimize layoff time associated with tying-up.

**Q** I am ready to start legging up my horse after his winter layoff. He has been off for about two months. Are there any nutritional considerations that will make this process more efficient and/or get better results?

**A** Yes, nutrition should definitely be considered in the conditioning phase of the training program. As a horse begins a conditioning program, the skeletal, muscular, respiratory and immune systems must adapt to the stresses of training. Nutrition is very important to insure a favorable response. For example, exercise stimulates the bones of the leg to remodel or adapt to the stress of conditioning. This bone remodeling requires a constant turnover of calcium and phosphorus. The muscular system must also receive proper nutrition. The most obvious dietary adjustment is to provide energy (calories) so the muscle can contract and

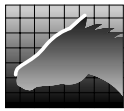
relax normally during exercise. In addition to energy, the muscle requires several minerals and vitamins to aid in its normal function and health. Critical minerals and vitamins include selenium, electrolytes (sodium, chloride, potassium, magnesium) and vitamin E. Without these minerals and vitamins, horses often suffer from “tying-up” syndrome and chronic fatigue. The respiratory system is responsible for delivering oxygen to, and transporting waste products from, body tissues. Iron and copper are essential components of these transport mechanisms. Finally, the immune system of the horse functions to fight off disease.

Trace mineral deficiencies (copper, zinc, selenium and others) are thought to depress the immune system.

To summarize, proper nutrition during the conditioning phase of the training program is critical to help prevent bone, muscle, metabolic and immune problems in athletic horses. A standard diet of alfalfa hay and oats typically will not provide those nutrients in adequate amounts. The inclusion of a well-balanced supplement to oats or the feeding of a properly fortified grain mix will go a long way towards maximizing the performance potential of a horse.

**Q** As the weather starts to warm up, is there anything that I can feed my horses to help them shed out quicker?

**A** Years ago a wise horseperson told me that you can feed many things to horses to help the hair coat; all you have to do is brush them afterward. From a more scientific standpoint, several nutrients are involved in the synthesis of the protein found in skin and hair. Zinc, biotin, protein (and the specific amino acid methionine), and fatty acids from dietary fat (such as vegetable oil and rice bran) are all necessary for hair growth. Most of these substances are found in the leading commercial hoof supplements on the market. This is not by accident since horse hoof is a form of modified hair. In fact, most testimonials regarding hoof supplements state the appearance of a “glossier” or “healthier” hair coat prior to seeing any influence on hoof quality. A simple feeding program that includes a source of additional fat along with a fortified grain mix containing supplemental protein, vitamins and minerals should help horses slip their winter hair. If more speed is necessary in getting the horses to turn loose of their winter hair, provide a normal dose of a quality hoof supplement. With either approach, just remember to brush them afterwards. ☺



# Kentucky Equine Research Team Member Directory

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011-4161-753-9620 FAX

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