

Muscle Rebuilding & Recovery

By Lauren Marlborough, BSc (Hons), CESMT

Equine muscle injuries are daunting, often frustrating for the rider, and can be just as challenging to diagnose by the veterinarian. The best way to prevent muscle injury is to keep horses in a regular exercise program and avoid demanding more of them than their level of conditioning permits. It's also a good idea to acknowledge the well-being of the horse throughout their fitness program by observing their attitude, adjusting their nutrition, keeping an eye on their appetite and weight in order to determine whether they are suffering from training demands, or thriving on them¹. Together this will give you a better idea on what is happening to your horse as a whole and allow you to continue monitoring their level of fitness, overall health and psychological state of mind as they progress through the conditioning program. Daily nutrition requirements should be evaluated on their individual needs, such as, their age, weight and work regime, and by maintaining a consistent feeding program appropriate to each horse to avoid overtraining and muscular injuries¹⁴.

Feeding management is critical to performance horses as exercise depletes nutrient levels and increases the requirement for some nutrients but not for others². A proper mixture of essential nutrients as a source of energy for an athletic horse includes protein, carbohydrate, fat, minerals, vitamins and water⁴.

Proteins consist of large molecules composed of one or more long chains of amino acids and are an essential part of all living organisms. In particular, performance horses have increased protein needs; although these increased needs can be relatively small (1-2%), they are required to support muscular activity, improve recovery, reduce muscle breakdown from training and competition, and support the joints and connective tissue. Most grass hays run about 6-10% protein, legume hays, such as alfalfa, can run as high as 14-15%⁸. Accidents, injuries, surgeries and substantial increases in physical, mental or emotional stress can also increase protein requirements for optimal recovery and adaptation⁸. Lysine supports immune function and is the most important amino acid in horses while Leucine, Isoleucine, and Valine specifically support muscular integrity and contribute to blood sugar control. Glutamine protects lean muscle mass, including connective tissue, and supports brain and nervous system health. The athletic horse also requires more carbohydrates and/or fats to provide energy (calories) for muscular contraction².

Carbohydrates exist in several forms: sugars, starches, fructans and fibres⁷. Carbohydrates in the form of starches and sugars



provide the substrate glucose, which is metabolized by cells in a process known as glycogen synthesis, which in turn, produces the energy (calories) required for exercise and performance. Research has shown that 75% of all plant matter is comprised of carbohydrates⁴ and commonly fed to horses in the forms of forage, cereal grains, beet pulp, legumes, fruits and vegetables⁷. As the horse progresses through a conditioning program, the increasing workload is associated with higher energy expenditure; this is usually supplied from carbohydrates by increasing the grain and reducing the hay in the diet² or by adding fats to the diet⁷.

Fats are another excellent source of calories as they supply more than twice the calories of equivalent amounts of carbohydrates or proteins. Beyond their role as a concentrated energy source, fats offer other benefits, such as; enhancing body condition, delaying fatigue, moderating glucose levels and insulin response, as a carrier for Vitamins A, D, E and K, they reduce cortisol levels associated with stress and energy levels, resulting in less lactic acid production and better muscle glycogen utilization⁷.

Minerals and vitamins are an essential part of your horse's dietary needs and are required for maintaining energy, performance and to prevention of health problems. However, one must monitor the levels of mineral and vitamin intake as there is a fine line between deficiency and excess, both of which can be detrimental to the horse's health.

Sodium and Chloride are considered primary electrolytes and control blood volume, muscle and nerve function and maintain blood pH⁷. Other electrolytes include: Calcium as a primary mineral in your horse's diet for bone development and maintenance; Phosphorus to aid in the development of bones, teeth and the horse's metabolism¹³; Magnesium as a crucial component in skeletal development, the muscles, nervous tissue and overall joint health; Zinc as an important contributor in the development of healthy hooves and bones, and as a cofactor of Vitamin D3 which is essential for calcium and phosphorus metabolism in normal bone growth and development; Copper, necessary to obtain bone and cartilage development; and Boron, necessary for bone and joint health¹¹. Alpha Lipoic Acid and the B-Vitamins all aid in reducing joint inflammation¹² while Vitamin C not only assists in reduction of joint inflammation, it also promotes cartilage healing³ and works well alongside of Vitamin E, which improves pain control⁵ and increases immune function in horses. Selenium is an essential component to your horse's diet to aid in the detoxification of lipo peroxides and hydrogen peroxides that are toxic to cell membranes. Biotin greatly increases the overall health of the hoof by improving horn hardness, growth rate and tensile strength, allowing less pressure and exertion of the horse's limbs and joints giving focus more so on sound feet^{6,9}.

Every cell within your horses body is partly made of water which is essential for all metabolic activities and for a number of vital physiological processes including sight, hearing, breathing, digestion of nutrients, cushion for the nervous system, regulation of body temperature (sweat), joint lubrication, waste elimination and muscle contraction strength. Even blood and lymphatic fluid are made of water, bringing sustenance to every part of the body⁷. Thus, horses should have free access to clean, fresh water at all times¹. Stiff muscles, muscular weakness or tremors can indicate that a horse could be suffering from dehydration as muscles cannot function properly when they lack oxygen, resulting in inadequate blood flow, accumulation of too much heat or metabolic waste products, or when electrolyte imbalance develops¹⁰.

In summary, even though proper conditioning plays an important role in sustaining your equine athlete's muscles, providing your horse with an appropriate nutrition program catered to their individual needs is just as important for preventing muscle injury, assisting in recovery and reducing the risk of recurrence.

Tetda is a natural liniment that is applied after exercise to soothe tired muscles, increases blood flow, aid in muscle recovery and help your horses' bruises, strains and sprains.

Equisel-Lyte not only aids in rehydration, but it is also a muscle builder. It essentially replaces the minerals lost in sweat while increasing the rate of repair of damaged muscles by using the branched chain amino acid (BCAA) ingredients to reduce muscle breakdown after exercise or exertion.



Equisel-Lyte BCAA all the benefits of Equisel-Lyte in syringe form; a convenient and easy administrative way to rehydrate and rebuild muscle in your horse immediately post exercise.

Gamma Oryzanol promotes the formation of lean muscle mass and is pure pharmaceutical grade with no fillers or additives

D-Ribose promotes speedy recovery after exercise, is an important component for ATP formation and is pure pharmaceutical grade with no fillers or additives
Dimethyl Glycine (DMG) promotes speedy recovery after exercise, reduces lactic acid build up and is pure pharmaceutical grade with no fillers or additives

MuscleGro is a concentrated paste that will encourage development of lean muscle mass with added support from ingredients such as BCAA, L-Glutamine, Gamma Oryzanol, R-Alpha Lipoic Acid and herbs.

Vantiox not only provides essential vitamins, minerals and antioxidant properties, but it has muscle and cell protecting abilities for optimal performance.

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Lauren Marlborough has been an avid horsewoman for over 20 years, with several years experience in a variety of roles in the equine trades. She earned a BSc from Lakehead University, a post-graduate Honours Biological Science degree from Brock University, certification as an Equine Sports Massage Therapist, and she obtained the Equine Science Certificate with Distinction from the University of Guelph. Lauren operates her own equine therapy business in Southern Ontario.

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