Fact Sheet

Electrolytes And The Competition Horse

The horse's capacity for work is truly amazing and there is perhaps nothing more thrilling than watching a horse compete in an endurance event, jump a cross-country course or complete a testing show jumping course. In order to be able to perform these feats, training and genetics are major contributors to performance, but nutrition has received wide recognition as a determining factor in the success or failure of equine athletes.

Electrolytes are supplements that are regularly used in horses diets, whether they be added to the horse's feed, dissolved in drinking water, or syringed directly into the horse's mouth. Although they are essential to help prevent dehydration, if they are not used correctly as part of a well-balanced feeding and management regime, these important minerals could potentially have a detrimental effect on your horse's performance and well being.

What are electrolytes?

Electrolytes are chemical compounds that ionize when dissolved to produce an electrically conductive medium (ions). Chloride, Sodium and Potassium are the minerals that are most commonly thought of when the term electrolyte is used, but other minerals such as Calcium and Magnesium are also important in their role as an electrolyte.

Electrolytes are found in the intracellular fluid (water inside the cells), the extracellular fluid, which consists of the plasma portion of the blood and the interstitial fluid, which surrounds the cells in the body. Calcium and Magnesium can be mobilized from the skeletal frame. Their role is to maintain osmotic pressure, fluid balance, and nerve and muscle activity.

Electrolytes and dehydration:

As a horse starts to exercise it will get hotter and it is vital for the horse to get rid of the extra heat produced to prevent the body from over-heating, which would eventually disrupt normal metabolic function. Heat is taken away from the working muscles by the blood to the skin and the respiratory tract where it can be passed to the outside environment. Like humans, horses rely on sweating as their main mechanism to remove excess heat from the body.

Sweat not only contains just water, but it is also made up of large quantities of electrolytes. During exercise, sodium, potassium and chloride are lost in large quantities together with smaller amounts of magnesium and calcium. The combination of water and electrolyte loss will lead to dehydration, which can eventually be fatal, but even a slight dehydration can significantly impair performance. A 450-500kg horse has around 300 litres of water in its body and a loss of only 3 litres of sweat would be enough to result in a 10% reduction in performance. Loss of water and these electrolytes causes fatigue and muscle weakness and decreases the thirst response to dehydration. Typical symptoms of a severely dehydrated horse will include a dull, depressed expression and glazed eyes, with dry mucous membrane and gums. By the time these symptoms are noticeable, the horse may have lost up to 5% of its body water, which is a very serious situation requiring immediate veterinary intervention. Therefore, it is vitally important that a performance horse starts a competition with optimal levels of fluids and electrolytes in their bodies and that these important nutrients are replaced throughout prolonged exercise.

Sweat Losses:

The amount of sweat that is produced by a horse will depend upon the duration and intensity of the exercise and the environmental temperature and humidity. In the UK typical temperatures will be between 50-70 F and a horse in moderate work will lose between 5-10 litres of sweat per hour. During higher intensity exercise and increased temperature, sweat losses can reach as high as 15 litres per hour.

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Electrolyte requirements:

First and foremost, it is essential that horses have continual access to plenty of fresh clean water. Withholding water even for a short period of time will result in loss of bodyweight and reduction in health and performance. It is good management practice to monitor how much your horse is drinking on a daily basis, as travelling and competing will not only increase your horse's water requirements but can also put him off drinking, thereby increasing his risk of dehydration.

Salt is the only mineral for which horses have an indisputable appetite, thereby displaying a degree of nutritional wisdom regarding its consumption. If salt is available, most horses will consume sufficient amounts to meet their needs without overindulging. Natural feedstuffs, such as pasture grasses, contain little sodium, often less than 0.1%. Most compound feeds do contain some salt but not enough to guarantee sufficient intake for horses that are in regular medium to hard work. Ideally this important electrolyte should be fed ad-libitum in the form of a salt block. Horses at rest will normally consume around 50 grams of salt per day from a salt lick. However, some horses do not reliably use a salt block so you may need to add some salt to your horses feed.

It is vital to adjust the amount of electrolytes fed according to the sweat loss of the horse. If a horse is only in light work then electrolyte supplements do not need to be used every day. However, if there is a loss of 3 litres of sweat, which can occur in less than an hour in moderate work and conditions, this is sufficient to reduce performance by 10% and most competition horses will benefit from electrolyte supplementation on a daily basis. As a general rule of thumb, 60 grams (2 ounces) of electrolyte supplementation are required for each hour of exercise in moderate climates.

Performance horses, such as endurance horses that are sweating hard and covering large distances may benefit from a specific electrolyte supplement formulated specifically for endurance competition. These supplements will contain sodium and chloride but also calcium, potassium and magnesium. If calcium and magnesium losses are not replaced by mobilization of skeletal stores or by supplementation, metabolic disturbances such as thumps may occur. These electrolytes should be administered to horses at each vet check and at water stops along the ride. Some electrolytes also contain an antacid to help reduce gastric acid build up caused by irregular feeding intervals during a competition.

It is important to stress that if you are using a concentrated electrolyte paste then the horse must have access to unsupplemented drinking water. Electrolyte pastes are hypertonic (a greater concentration of electrolytes) compared to the blood and will effectively draw fluid out of the horse into the gut if they are not diluted by drinking water. Administering large doses of electrolytes without adequate water intake will result in serious problems including colic, increased dehydration and even possibly death.

Other considerations:

When choosing an electrolyte supplement, make sure that sodium and chloride are the main ingredients and not glucose. If your electrolyte supplement does not taste of salt it is unlikely that it is going to be effective!

Ensuring adequate fibre intake is important to combat the effects of dehydration. Fibre in the hindgut traps water and electrolytes acting as a reservoir, which can be called upon during exercise.

Feeding readily digestible fibre sources such as, soaked sugar beet is also useful. Sugar beet holds water but is readily fermented and so releases the water into the digestive tract.

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