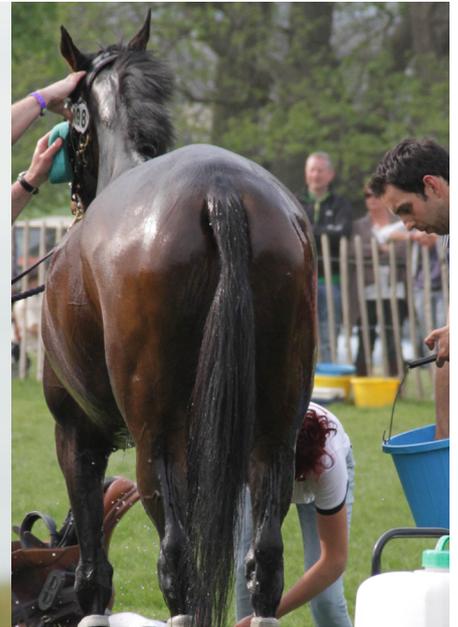




electrolytes



The use of electrolyte supplements has the potential to significantly affect a horse's performance and recovery from exertion; here we take a look at the science and the practicalities behind their effective use.

Horses, like humans, sweat to cool the temperature of their body which increases when muscles work, when the ambient temperature rises or as a response to stress. Electrolytes (salts) are minerals which form charged particles, or "ions", when dissolved in water. They are integral components of body fluids, causing cells to have electrical charges according to the concentrations of the various ions inside and outside the cell membrane.

This phenomenon is involved in important cellular functions, including maintenance of fluid balance, muscle contraction and the transmission of nerve impulses. When the body sweats it releases these body fluids via the sweat glands with the horse losing chloride, sodium and potassium and smaller amounts of calcium and magnesium. Body fluids need to be kept at a certain concentration (osmolarity) so, when water and electrolytes are lost in this way, the osmolarity is changed, an imbalance of salts occurs and tissue and organ function are affected.

This can lead to general and muscle fatigue as well as inability to concentrate and reduced co-ordination, all of which are not good news for any horse, let alone one who is expected to perform over long periods and/or over several days like the endurance horse or three day eventer. Consider the effects of a hangover in humans, which are in the main due to dehydration (fluid loss) caused by alcohol consumption, and you can appreciate how a horse could feel if dehydrated due to fluid and electrolyte loss through sweating!

Water Losses

The body monitors the levels of sodium in body fluids so, when water is lost, the concentration of sodium increases and triggers the horse's thirst mechanism. Ironically, providing the

horse with water alone to replace that lost through sweating can lead to further problems, since the water will be absorbed and dilute the existing levels of sodium. This then stops the desire to drink, even though the body may still need more water (be dehydrated), and at the same time the kidneys are triggered to excrete water until the sodium concentration is back to normal, compounding the problem still further.

The most effective way to help replace fluid losses therefore is to provide a solution of water and electrolytes mixed to a concentration (osmolarity) which is the same as body fluids (isotonic). This helps the body recover from dehydration by providing fluid without unbalancing sodium levels and thus suppressing the thirst response.

Electrolyte Losses

Most horses on a fully balanced diet, comprising good quality feed and forage, and in light to moderate work, will receive sufficient electrolytes to meet their daily requirements, with any potential short fall being made up by the addition of 1 to 2 tablespoons (25 – 50g) of table salt daily or free choice access to rock salt in their manger. Since electrolytes are lost mainly in sweat, requirements can however be dramatically increased for horses exercising over longer periods or working



were to provide 50 – 100g per day, could take 5 to 10 days to replace without additional supplementation.

Selecting an Electrolyte Supplement

So electrolyte supplements are clearly useful to help a horse both replace lost electrolytes and to rehydrate efficiently and safely. Ideally the formulation should mirror the levels of salts (electrolytes) lost in sweat; a useful guide is that the quoted levels of sodium plus potassium should roughly equal the amount of chloride in the formula.

There should also be small amounts of calcium and magnesium along with some sugar, generally dextrose (a form of glucose) which helps to improve palatability and also increases the rate of absorption of the electrolytes across the gut wall. Some suggest “homemade” electrolytes combining table salt (sodium chloride) and “Lo-Salt” (potassium and sodium chloride) but well known brands, like Baileys Aqua-Aide, contain a range of salts and include ingredients selected for maximum absorption, present in the correct proportions and readily available to the horse.

Using Electrolyte Supplements

As we’ve discussed, an isotonic solution of electrolytes mixed in water is the ideal way to help the body rehydrate as quickly as possible and should ideally be given within an hour of work, or sweating, finishing, although endurance horses who are sweating over prolonged periods can be given an isotonic solution at vet gates.

Most electrolyte supplements should carry instructions on how to make up a solution though getting the horse to drink it may have mixed results. In theory, an isotonic solution should taste more appealing to the dehydrated horse than one that is either weaker than body fluids (hypotonic) or stronger and saltier (hypertonic). Ideas like adding apple juice, or sugar beet water, to the water to aid palatability are all worth a try to encourage a horse to take electrolytes in this way.

The Reality!

In the event of a horse not wishing to drink water containing electrolytes, they can be administered either in feed or via a syringe directly into the horse’s mouth. When given in this way however it is absolutely imperative that the feed is made wet and slushy and that the horse has access to plenty of fresh drinking water. A small amount of wet soaked sugar beet pulp, perhaps with a handful of alfalfa or chaff added, can be used as a basis for adding electrolytes and is safe to offer straight after a cross country run or at a vet gate.

Because electrolytes are “hygroscopic” (attract water), if they are taken with insufficient water they will draw fluid into the gut from the surrounding tissues, worsening the horse’s dehydration. This can have particular implications for the endurance horse given a syringe of electrolyte paste at a vet gate and then not drinking sufficient water before having to continue the ride.

The Benefits

Whilst we cannot “preload” the system because the body can’t store excess electrolytes, it is still worth giving electrolytes prior to competition to be absolutely sure a horse will not be starting out with a deficit. Electrolytes stay in the system for about four hours before an excess is excreted by the kidneys, so a carefully timed feed containing electrolytes

intensely, especially during warmer weather and in hot, humid conditions.

For example, a horse can lose up to 10 – 15 litres of sweat per hour containing about 10g of electrolytes per litre of sweat. Even an isotonic electrolyte solution will only contain 1g of electrolytes per litre so a horse would need to drink large volumes of such a solution to replace electrolyte losses. For those working harder and longer, like endurance horses, losses could amount to 500g at the end of a two day ride which, if the normal diet

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or isotonic drink can be worthwhile on the day of a competition.

Don’t forget the impact of travelling on a horse’s hydration status too; offering water or an isotonic solution every couple of hours on long journeys should help avoid unnecessary fluid and/or electrolyte deficits before the competition has begun. Research has proven that correct administration of good quality electrolytes before and during moderate to intense work can increase the time it take for a horse to fatigue by nearly 23%; that means a horse can continue to work for 23% longer before getting tired.

It has also been shown that when horses receive electrolytes within an hour of work being completed, recovery is improved and the horses are able to bounce back and perform to the same level on a second and third day. This is clearly important for many performance horses but highlights that any horse who sweats could benefit from receiving an electrolyte supplement.



For further information or a practical and individual diet for your horse, contact one of Baileys Nutrition team on 01371 850 247 (option 2)
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