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Dehydration and Fluid Loss

By Dr John Kohnke BVSc RDA

Dehydration is a common problem in racing and hard working horses, particularly during the summer months. Dehydration is caused by the excessive loss of blood and tissue fluid without adequate replacement of fluid by intake of water or moisture in the feed.

The most common causes in racing and working horses include:

1. Heavy sweat and respiratory loss under hot conditions or during hard, extended training. A horse can lose 5-11 litres of sweat per hour working under hot, humid conditions.
2. Low grade, 'cow pat', acidic, watery diarrhoea due to high grain rations which trigger hindgut acidosis and reduce water resorption from the hind gut.
3. Reduced water reserve in the hindgut resulting from high grain, lower fibre racing rations with minimal hay as roughage.
4. Feeding all dry feeds, including large volumes of hay, with an average of 10 - 12% moisture.
5. High lucerne hay diets hold a lower water reserve in the hindgut and more free water is passed out in the droppings because lucerne fibre absorbs less water. Often horses pass softer droppings with a higher moisture content and a risk of 'anal dribble' down the inside of their hind limbs after passing their droppings.
6. Inadequate water intake - 'poor-drinkers', dirty water or excessively warm water in drinkers/tubs. Some horses will not drink sufficient chlorinated town water or bore water with a high salt or mineral content to maintain adequate hydration if they are accustomed to drinking dam or rain water.
7. Rations low in electrolytes (water intake not stimulated) or too high in electrolytes (excess water passed out through kidneys or in the droppings).
8. Long term training - stress related hormonal changes which result in lower water retention.
9. Diarrhoea of any cause resulting in excess fluid loss in droppings.

Handy Hint

Evaluation of Dehydration

The state of dehydration can be evaluated by **appearance** (skin dryness), **skin elasticity** (pinch test), **degree of 'belly' tuck up** (reflects fluid reserves in hindgut), **loss of body weight** on weighing scales (less fluid weight), **gum colour and membrane dryness**.

It can also be assessed by the Plasma protein or Total Protein reading in a blood count, which is an essential reading when interpreting a blood count.

Management

The management and correction of dehydration is a combination of determining the underlying cause (eg diarrhoea, lack of water, chronic sweat loss, fever, long term 'over-training' syndrome), providing electrolytes and fluids, dampening the feed and hay, and in severe cases, emergency IV fluids.

It is important to cease working/training a horse with moderate to severe dehydration as metabolic stress, muscle damage and heart damage may occur.

The severity of dehydration is classified into mild, moderate and severe, relative to the degree of fluid loss

Degree of Severity	Total Protein Reading	Skin	Belly	Mouth Membranes
Normal Hydration	60 – 64 g/L PCV 0.34 – 0.40	Elastic, soft, flexible	Let down normally	Moist and pink
Mild Dehydration (up to 4% fluid loss)	65 – 67 g/L PCV 0.40 – 0.45	Dull coat, slight loss of skin elasticity	Slight tucking up	Darker and less moist
Moderate Dehydration (up to 5-6% fluid loss)	70 – 76 g/L PCV 0.46 – 0.50	Dull, dry coat, slow skin pinch test	Obvious tucking up 25-35 kg bodyweight loss	Darker, dry and sticky
Severe Dehydration (above 7% fluid loss, lack of water, severe diarrhoea, fever)	Above 76 g/L PCV above 0.50 Very serious condition	Dull skin, skin pinch 7 seconds	Tucked up severely, 35-50 kg body weight loss	Very dark, sticky and slow capillary refill. Immediate veterinary attention and IV fluids necessary to save a horse's life.

Dehydration and Fluid Loss

Provide Hydration Fluid after Training/ Travelling

Studies have shown that horses prefer to drink cool (not cold) water from the 'hose end' or preferably luke-warm water after exercise. Many trainers condition horses to drink molasses water or weak rehydration fluids after exercise each day. One cheap and highly effective way of rehydrating a horse after daily exercise, travelling or after a race or competition, is to provide 5 litres of luke-warm water (eg add hot water from a thermos to cold water) containing 50 g (2 ½ tablespoonsful) of plain, fine table salt (it dissolves quickly) and 50 g glucose or dextrose (glucose assists sodium uptake from the small intestine) to ensure its palatability. Horses can be conditioned to drink the warm, salty water after each training session by offering it in a small tub or bowl/dish - after a couple of days they will begin to drink the fluid once 'hooked' on it. It is an easy, effective way of rehydrating a horse within 5-10 minutes after training, or following competition before the return trip to home stables.

Electrolyte or Salt Mix Supplements

Supplements of salt (sodium chloride), potassium, bicarbonate etc are given in the feed to help replace salt lost in sweat and stimulate the thirst response to encourage horses to drink. Many electrolyte supplements are based on 50-70% salt and are often low in potassium – an electrolyte most likely to need replacement after exercise.

However, do not exceed the recommended supplementation rates, especially when feeding prepared commercial feeds which can contain 1% salt and other electrolytes.

Always provide a source of cool, clean water in a volume which doesn't heat up in outside yards during hot weather. Check and clean automatic drinkers daily. Routine dampening of all hay before feeding helps provide additional moisture and reduces dust.

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Handy Hint

Choice of a Salt Mix

There are a multitude of electrolyte and salt mixes available. **Kohnke's Own Cell-Salts** is different - it is a salt mix formulated to correct low feed levels rather than just replace salts lost in sweat after exercise. It is a concentrated mix of some sodium chloride (salt), high potassium and magnesium in a slow release formulation, to which you add your own salt (salt is cheap) to meet sodium needs. Simply add 1 scoopful (30 g) of Cell-Salts and the same scoop size (30 g) of plain, fine salt to the feed of lightly worked horses or those on commercial feeds. Add 1 ½ - 2 scoopful of Cell-Salts and an equal amount of salt to grain mixes or for heavily worked horses (such as pacers). A separate formulation, **Kohnke's Own Troppo-Salts**, containing Vitamin E and Vitamin C, formulated to be given on a 'scoop for scoop' basis with salt, is available for horses worked under hot or tropical conditions and may be supplemented to horses with non-sweating disease under these conditions.

Handy Hint

Avoid Strong Saline Drenches

One of the most popular methods used to correct dehydration and 'flush the kidneys' of metabolites is to stomach tube a hypertonic saline drench. A saline drench made up of over 100 g of electrolyte mix in 4 litres of water has a mild irritant effect on the stomach and intestinal wall and can result in diarrhoea. All salines must contain a minimum of 4 litres of water to avoid gastro-intestinal irritation. Often strong salines will dehydrate a horse to a greater degree for 6-8 hours after stomach tubing due to reverse osmosis and flow of fluid back through the intestinal lining drawn by the strong salt mix.

Handy Hint

Horse Exhibits Discomfort after Strong Saline

If a horse goes down to roll, or appears uncomfortable (pawing the ground, looking at its flank or 'sitting down like a dog' within 1-5 minutes after a saline drench is administered, it is possible that the animal has a gastric or duodenal ulcer which is irritated by the strong salt solution. Consult your vet to check for gastro-intestinal ulcers.

Handy Hint

Take Care when Administering Electrolyte Pastes

It has become routine for endurance riders and some harness and galloping trainers to administer electrolyte and vitamin pastes to their horses during or soon after hard or heavy sweating exercise. Observations in endurance horses found that when concentrated electrolyte pastes were administered during or soon after a ride, there was a 57% incidence of gastric irritation and development of gastric ulcers if horses were not given access to or offered water after the paste was given over the tongue. If you do administer an electrolyte paste, ensure that the horse has access to clean, preferably slightly warmed fresh water to drink to promote rehydration and reduce the potential for gastric irritation. If water is not available during a ride, administer the paste only when water is available for the horse to drink.

