

Cold Water Cooling for Hot Horses

DR DAVID MARLIN Leader of the Atlanta Project The Animal Health Trust shares his advice and information about Cold Water Cooling for Hot Horses including techniques and background information

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Why does the horse get hot?

The horse's normal rectal temperature at rest is around 37-38°C(98.6-100.4°F). When muscles work, they produce heat. For every unit of energy used to make the muscles contract, around four times as much energy is lost as heat because the process of conversion of energy to movement is not very efficient. What happens when a horse overheats?

Very high body temperatures (above 41°C) result in high sweat rates, large sweat losses (water and electrolytes), dehydration and consequently a reduction in performance, or more serious consequences such as heat exhaustion and even death. How does a horse lose heat?

- Convection The heat is produced in the muscles and then carried to the surface of the horse's skin by the blood. If the surrounding air is cooler than the horse, as the horse moves through the air or as air passes over the horse, then heat will be lost by the process of convection. The greater the difference between the horse's skin temperature and the surrounding air, or the stronger the air movement (natural breeze or fans), the greater the rate at which heat will be lost.
- Evaporation Heat is lost when sweat evaporates from the horse. Sweat that drips from the body however, does little to keep the horse cool and is essentially wasted fluid loss. Sweating is highly effective when the horse is in a hot and dry environment, yet in a hot and humid environment the rate of evaporation from the skin is much lower. This is because the rate of evaporation depends mainly on the difference between the moisture level of the skin and that of the environment.
- Respiration In the horse, around 15% of heat loss can occur through breathing. This is part of the reason why horses may have high respiratory rates during and after exercise in hot or hot and humid conditions.

Warming-up or over-heating?

A moderate increase in body temperature is not a disadvantage. Horses should be warmed up prior to exercise. Muscles work more efficiently when they are warm. When it is hot the horse will warm up faster.

Why should horses be cooled with cold water?

The horses willingness to exercise hard and our previous lack of a precise understanding of how different environmental conditions affect the horse, has led to a number of competitions where horses have suffered heat stress, including at the Barcelona Olympic Games (1992) and the World Equestrian games in the Hague (1994). Regimes for cooling horses with ice-cold water at competitions in hot climates have been criticised even though the cooling is beneficial and some

people have suggested this type of cooling may cause other problems such as "tying-up".

Which horses will benefit from cold-water cooling?

Any horse at any competition or show at any level including: Event horses, dressage horses, show jumpers, racehorses, polo ponies, endurance horses, driving horses, and horses or ponies in gymkhanas. Fact: Horses that are hot (above 40°C or 104°F) and competing in hot environments (above 26.5°C / 80°F) and are cooled quickly during or after competition are less likely to suffer heat stress, will recover more quickly, will not become as dehydrated and are almost certain to perform better.

Cold water cooling technique

All that is needed are some large buckets to hold 40-50 litres of water and ice, smaller buckets, giant sponges and three assistants - one to hold the horse and one person to cool each side. It is not necessary to remove the tack. Start to cool the horse whilst taking the horse's rectal temperature. Liberally apply cold water to all parts of the body including the quarters, as this is where most of the large muscles used for movement are located and so is an area that gets particularly hot. It is not necessary to scrape off excess water after each application, it is more important to continue to apply cold water. If you wish to scrape off the excess water, do so quickly at the end of each 30 second cooling period and while the horse is being walked between cooling periods. Carry on cooling the horse for 20-30 seconds, walk the horse for 20-30 seconds and cool again. The walking and cooling sequence is IMPORTANT. The walking promotes skin blood flow and the movement of air aids evaporation. If possible, carry out the cooling and walking in the shade.

Check the horse's rectal temperature at intervals. It should be possible to reduce rectal temperature by around 1°C in 10 minutes. There is no evidence to suggest that there is any harm in letting your horse drink small amounts of water (half a bucket) during competition (e.g.: during the 10 minute box in Three Day Eventing), between rounds (e.g., Showjumping, Mounted Games) and during long warm-up periods (e.g.: Dressage), which will also help to cool the horse down and reduce the effects of dehydration. When should I stop cooling?

When the horse's rectal temperature is less than 38°C - 39°C, when the horse's skin feels cool to touch (over the quarters) after a walking period, if the respiratory rate is less than 30 breaths per minute and if the horse begins to shiver. The rider

Mistakes and falls occur because of hot, tired horses - but the same applies to the rider. To cool the rider, remove their hat, sit them in the shade, wash their face with cold water (which makes you feel better, but is not very effective at reducing body temperature) and encourage them to drink an isotonic drink such as Lucozade Sport (isotonic = same concentration as body fluids). The rider should also wear light coloured, loose fitting, cotton clothing. In addition, the hat should be lightweight and a comfortable fit.

What not to do

- Ice in the rectum does very little to lower body temperature. It makes it hard to assess body temperature and can hide a high temperature. Masking a high temperature from vets at events is unwise as it will prevent a horse receiving appropriate cooling and other necessary treatments, which may result in the development of heat exhaustion and death. The chances of injury will also increase if the horse is allowed to continue when overheated and dehydrated.
- Don't hold small bags of ice over the head, neck, under the tail, on the quarters, etc. Instead, concentrate on cooling as much of the body surface as possible. Holding bags of ice is likely to reduce cooling by stopping skin blood flow to the area under the pack.
- Do not place wet towels on the neck or quarters. Although at first the towel may be wet and cold, it soon warms, and hinders the loss of heat, acting as an insulator.
- Excessive application of grease prior to cross-country limits sweating. The grease acts as an insulator, prevents sweating and limits sweat evaporation.
- Do not let horses stand still for prolonged periods. If cold-water cooling is adopted, do so completely and not tentatively. The cold water on the skin will reduce the horses sweating rate. This has the advantage that because the horse sweats less, it becomes less dehydrated.
- There is no harm in allowing horses to drink small amounts (half a bucket) during competition. Water should also be left in the stable until 15-30 minutes before exercise. Water is emptied very rapidly from the stomach. **DO NOT** give the horse ice cold water to drink. Recent research has also shown that it is important to feed hard feed and some hay together, at least 4 hours prior to exercise.
- There is no evidence to suggest that cold-water cooling causes other problems such as "tying-up"

It is important that we learn to apply new ideas and findings from various studies so that we can maintain or improve the welfare of competition and pleasure horses at all levels.