Surviving the Summer Heat

An elevated body temperature is not only uncomfortable, but can be dangerous as there is a critical point above which your horse's central nervous system becomes impaired.

By Katelyn McNicol, BVSc

Summer is nearly upon us, and no doubt we have all noticed the temperature and humidity steadily creeping up. And whilst many of us are able to hide away from the heat in air-conditioned homes and offices, most of our big four-legged friends are not so fortunate and have to tough it out in the elements.

This article will help highlight some of the dangers of living in a hotter climate, as well as provide some management tips that can help your horse through the Summer months.

Temperature control

Our body naturally produces heat from cellular metabolism, muscular contractions and fermentation of our food, and is absorbing heat from external sources, such as the sun. Our ability to keep our temperature at the normal level depends on our body's ability to manage these sources of heat.

This is achieved through a variety of ways, including evaporative loss through breathing and sweating, dilation of surface blood vessels to lose heat through convection, conduction of heat from deeper within the body to cooler surface tissues by our circulation and by radiating heat from our body surface to the cooler ambient air. It is when our bodies fail to be able to manage these heat exchanges that hyperthermia, dehydration from sweating and, ultimately, heat stress can occur.

Mammals, as a group, have a variety of ways of dissipating heat from the body. Dogs predominantly lose heat by panting and sweating from their paws, whilst horses are more like humans and rely predominantly on sweating through their skin. When we sweat, heat is transferred from our body to the sweat, which then evaporates, thus cooling us down. Brisbane, for example, tends to have a high humidity meaning the air is saturated with moisture, leaving little room for this sweat to evaporate and take away our heat.

Heat stress

Your body's temperature will often creep above normal during the hottest Summer days and after exercise. These small changes in temperature easily and quickly resolve on their own when, for instance, you move into the shade or stop exercising. Heat stress occurs when there is an elevation in body temperature paired with dehydration and electrolyte derangements.

It is then that more proactive measures are necessary to cool the body and, in more severe cases, medical intervention is required. A quick assessment of your horse can help give you some clues as the whether your horse is coping with the heat, needs some extra attention from you or if veterinary intervention is needed.

Rectal temperature

One of the most useful items a horse owner can have in their first aid kit is a digital thermometer. The normal rectal temperature for a horse is 37.5–38.5 degrees. If your horse's temperature is above this, it will either be due to a fever from an illness or from an inability to cope with the amount of heat produced and absorbed by their body.

In the case of a fever, this increase is driven from within the brain where the normal temperature 'set point' has been tricked into increasing, due to inflammatory cytokines.

The body can easily become overheated from exercise and it is not uncommon for a horse's rectal temperature to become elevated after hard exercise, such as show jumping or cross country so, as a general guide, your horse's temperature should return to normal within 30 minutes of finishing exercise.

An assessment of the environmental conditions and whether your horse has been exercising should help differentiate the cause of your horse's elevated temperature.

An elevated body temperature is not only uncomfortable, but can be dangerous as there is a critical point above which your horse's central nervous system becomes impaired. At 41 degrees, denaturation (unravelling) of cellular proteins begins which, if left untreated, will eventually lead to organ dysfunction, organ failure and death. Once your horse's temperature reaches this critical point, the normal homeostatic mechanisms that regulate their temperature also begin to fail, such as peripheral vasoconstriction and reduced cardiac output, which will further exacerbate the heat stress.

Hydration

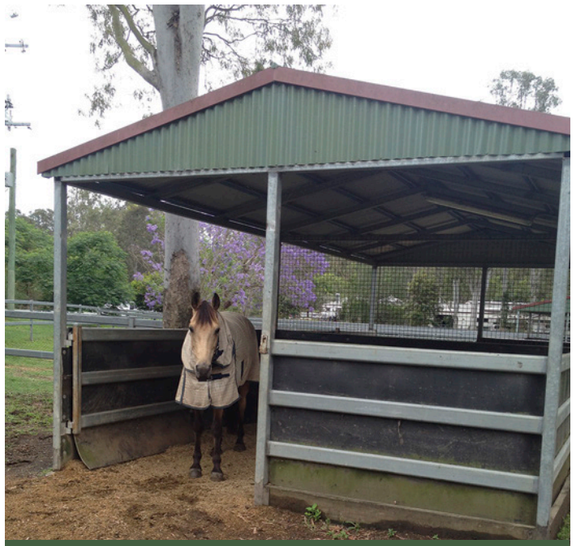
Next, it is important to assess your horse's hydration. This can be difficult to accurately assess at home, but there are some rough guidelines that you can use. Assessing your horse's 'skin tent' will tell you how hydrated their peripheral tissues are.

This is assessed by pinching some skin over the shoulder and seeing how quickly it snaps back into place. In a normal, hydrated horse, the skin should spring back into position. In a dehydrated horse, the tent of skin will stay in place. You can also check your horse's oral mucous membranes, which should be light pink and moist. If they are dark pink and tacky, your horse may be dehydrated.

When we are dehydrated, our urine becomes more concentrated, in an effort to conserve water, and becomes darker and lower in volume. This also happens with horses. However, there is wide variation in the intensity of colour and the turbidity of horse urine so, to avoid misinterpretation, your assessment should be done taking into account any other clinical signs of dehydration.

Dehydration can also lead to colic where excessive water is absorbed from the gastrointestinal tract, resulting in constipation (impaction). Very hard and dry faecal balls or faecal balls covered in yellow mucous can indicate the manure has been sitting in the colon for too long, and signify dehydration and poor gastrointestinal motility.

If your horse appears normal and comfortable, close observation and access to fresh water over the next 24 hours is recommended. If your horse shows any signs of dullness, colic, reduced appetite or their faecal output stops completely, your veterinarian should be called.



Whether to rug your horse or not is always a debated topic. It relies on your own assessment of your horse. If a rug is necessary, a lightweight, low denier rug is recommended.

Shelter is crucial for any horse at any time of the year. This can be in the form of trees, shelters or stables. Shade afforded by trees will actually be cooler than from a structure, such as a shelter.

Other clinical signs

When your horse's body temperature is elevated, their body will increase their respiratory rate to try and cope. A normal respiratory rate is 20 breathes per minute but, in heat stress, there will be an increase in rate and respiratory effort, i.e. your horse will appear to be out of breath.

Other clinical signs include an increase in heart rate and excessive sweating. Ironically, heat stress can also lead to anhydrosis, a condition where your horse will partially or completely lose their ability to sweat. As mentioned earlier, sweating is the primary way horses reduce their body temperature, so an inability to sweat will rapidly lead to dangerously high body temperatures and further worsen the heat stress. In more advanced cases, there may be a decrease in anal tone, prolapsed penis, colic, diarrhoea and seizures.

Remember that it is always important to practice basic hygiene when coming into contact with any of your horse's bodily fluids, such as saliva or faeces. Gloves should be worn or hands washed immediately after checking their temperature or mouth.

Risk factors

How you manage your horse during the Summer months is critical to their comfort. Take caution when exercising your horse by riding during the coolest part of the day or, if you have the luxury of lights, at night. If you must work your horse during the hotter days, then keeping your riding session short and at a lower intensity will help. Combine this with appropriate measures to cool your horse down adequately afterwards, as discussed below, and you should get through the Summer months problem-free.

Overweight horses have a higher risk of developing heat stress, due to their large body mass relative to skin surface area. This means they are not only producing more body heat, but have a smaller surface area to help dissipate this heat.

Horses with Cushing's syndrome typically have a longer and thicker coat meaning they will have a noticeably harder time losing heat through sweat and evaporation. Treating your horse for Cushing's will reverse this coat change but, in the interim, they may need to be clipped to prevent overheating.

Heat can also worsen some respiratory conditions, such as chronic obstructive airway disease, inflammatory airway disease and recurrent airway obstruction, so if you know your horse has one of these conditions, they may need special attention during the Summer months.

Treatment

The treatment for heat stress will depend on the severity of clinical signs and rectal temperature. If your horse is showing the more extreme signs, such as muscle weakness, incoordination, recumbency or seizures, your veterinarian should be contacted immediately. If your horse's temperature is over 41 degrees, contact your veterinarian and alert them to your situation.

If your horse only has a mild case of heat stress, you can try the following treatment at home and see how they respond. Move your horse to a shady spot and saturate with a hose. The next step is important. The heat from their body will be transferred to the cool water, so it is essential that you scrape the excess water from their body, and then repeat the hosing and scraping process until their temperature starts to respond.

Heat can also worsen some respiratory conditions, such as chronic obstructive airway disease, inflammatory airway disease and recurrent airway obstruction.

The use of fans is also effective by creating air movement and promoting evaporation. Additional cooling methods, such as ice boots and misters, can also be used. Electrolyte replacements can also be given and always ensure cool water is available. In more severe cases, your veterinarian may need to treat with intravenous fluids, and correct electrolyte and acid-base derangements.

Electrolytes

Electrolytes are important for helping to maintain normal water balance in our body, and to help our muscles and organs to function normally. Your horse loses electrolytes, such as sodium, potassium, calcium and magnesium, when they sweat.

- Sodium: This is the predominant electrolyte lost in sweat. It is involved in a huge number of interactions in the body, such as maintaining fluid balance between cells and circulation, allowing nerves to function, muscles to contract and maintenance of acid-base balance.

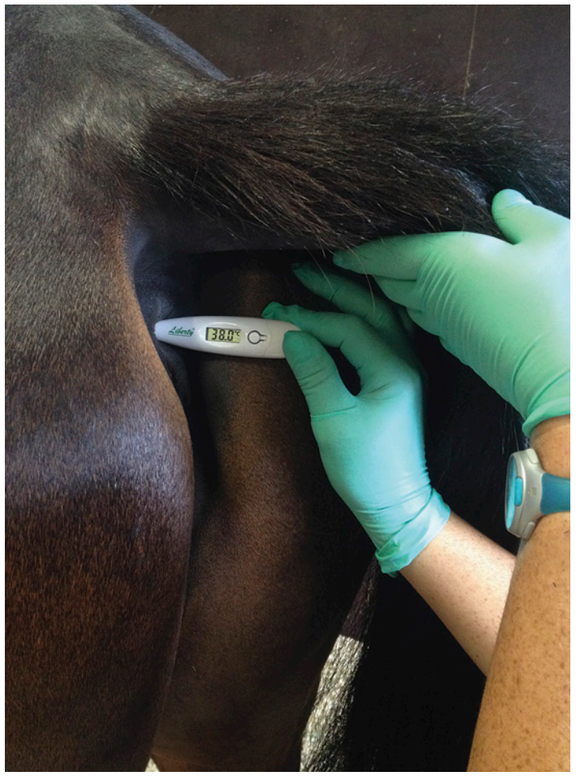
- Calcium: The importance of calcium for bone strength is well known, but calcium also plays a vital role in muscular contraction. This is not only the contraction of skeletal muscles, for example leg muscles, but also cardiac muscle and smooth muscle, such as that found in our intestines. Calcium is also used in energy metabolism.

- Potassium and magnesium are both involved in healthy muscular function and help prevent muscular cramps. Magnesium is also involved in glucose metabolism, nerve function and blood pressure regulation, to name but a few.

There are large number of electrolytes all working together in your horse's body to allow normal cellular activity. It is when the levels of these electrolytes are depleted or imbalanced that medical conditions can develop.

Generally, a horse on a well-balanced diet will be receiving adequate levels of minerals, electrolytes and nutrients. It is when we ask our horses to perform in tough conditions or are sweating excessively, that excessive losses can occur and, therefore, additional supplementation can be necessary.

There are a multitude of electrolyte replacements on the market, often which product is used comes down to whether your horse will eat or drink it! Just remember that you are aiming to replace electrolytes that are being lost, therefore a horse standing in the paddock during Winter is very unlikely to need replacement electrolytes, whereas a horse that has just competed on the cross country course on a Spring day may benefit from an electrolyte replacer on the day of competition.



Electrolyte depletion can potentially contribute to several medical conditions, such as synchronous diaphragmatic flutter (thumps or equine hiccups), rhabdomyolysis (tying-up) and anhydrosis.

Hot conditions

Before making any drastic changes to the management of your horse, it is worthwhile observing them and seeing if they are coping with the heat. Many horses are comfortable throughout Summer and only have mild issues during the more severe heat waves. If, however, you think your horse is struggling, there are some management practices that can be adopted to make their lives more comfortable.

Shelter

Shelter is crucial for any horse at any time of the year. This can be in the form of trees, shelters or stables. Shade afforded by trees will actually be cooler than from a structure, such as a shelter, due to evaporative cooling from the tree.

Having both options for your horse is ideal. Stables can be excellent for avoiding the sun, but can present other problems, such as lack of air flow and can often be hotter than standing in the paddock under a tree. Stables provide the opportunity to install items, such as fans and misters, which can dramatically improve your horse's comfort and heat dissipation.

Water

It is vital that your horse has easy access to water at all times. It can be ideal to have multiple water stations, which are changed regularly to keep the water cool. Additional water containing

Only take your horse's temperature if you can safely do so without getting kicked. Your safety is the priority. Practice good hygeine: wear gloves or wash hands after taking their temperature.

sweeteners, such as molasses, can also be offered to encourage increased water intake.

Do not do this if you have a laminitic horse or pony as the sugars may worsen this condition. Electrolytes can be added to the water to compensate for electrolytes lost in the sweat. Always have another fresh water source available as well as some horses do not readily drink electrolyte products.

Hosing your horse is a special treat, even if your horse appears to be coping ad may help prevent heat stress.

Rugging

Whether to rug your horse or not is always a debated topic. It relies on your own assessment of your horse and how they tolerate rugging. Black horses can sometimes be cooler with a white rug than without, whereas the opposite can be true for grey or white horses.

To rug or not must be juggled with the benefits of rugging, such as insect protection for horses with Queensland itch and sun protection for those horses with pink skin. If a rug is necessary, a lightweight, low denier rug is recommended.

Taking an accurate temperature

Only take your horse's temperature if you can safely do so without getting kicked. Your safety is the priority.

Practice good hygiene: wear gloves or wash hands after taking their temperature.

1. Insert a digital thermometer into the centre of the anus.
2. Once inserted, gently lean the thermometer against the rectal wall. This will help ensure you are not sitting in a pile of manure or an air pocket, which can alter your reading.
3. Wait until the thermometer beeps and then repeat the reading. If the second reading is higher than the first, continue to check the temperature until you get a consistent reading.

ABOUT THE AUTHOR: After graduating with honours in 2009 from the University of Queensland, Katelyn McNicol joined the WestVETS team as a mixed animal veterinarian. Although Katelyn loves all animals, her true passion is horses, being particularly interested in medicine and anaesthesia. Katelyn has also undertaken further study in equine dentistry and she is dedicated to the science of balancing a horse's teeth to enhance health, nutrition and performance.