



**Vic Branch ACDS**

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# **HEAT POLICY**

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## INTRODUCTION

In Australia, summer days often produce extreme heat that can be exacerbated by the exertion applied during competition or distance driving (such as charity drives/pleasure drives/training). These circumstances can instigate concern and their owners will most likely strive to help their horses adjust to remain comfortable and healthy. With a well-planned management programme, horses can stay comfortable and cool, even in the middle of summer.

Light driving isn't likely to bring on a state of heat stress, unless there are extenuating circumstances like extreme heat and humidity and/or over-working the horse for the conditions of the day.

The primary responsibility for the welfare of horses competing and exercising during hot weather lies with the driver. Drivers must always take preventative action to manage and treat stress in their horses.

Event organisers are responsible for providing adequate facilities and information that drivers need to safeguard the welfare of horses

## HORSES AND HEAT

Heat Stroke is different from Heat Stress.

**Heat Stroke** can happen over a short period of time and in a variety of circumstances, for example:

- An unfit horse who works very hard in hot temperatures, or
- A horse confined to hot trailers with poor ventilation

**Heat Stress** is typically due to fluid and electrolytes being lost over an extended period of time due to varying factors.

When standing in the sun without shade or a breeze, horses will commence to retain heat in temperatures above 33°C.

Heat can have a detrimental effect on a horse's health and well-being a lot more than it does humans. Heat stress in horses can cause high body temperatures, weight loss, low performance and a dramatic intake of water.

An average sized horse can produce an amazing amount of sweat – approximately a quarter of a litre per minute. If that is multiplied by 60 minutes of exercise, that amounts to 15 litres per hour. Horses have a generous amount of fluids in their systems; allowing for a comparatively high level of fluid loss, but there is a cost. The horse uses energy to produce sweat; meaning there is a loss of electrolytes and water, which causes its own problems. They become dehydrated and their electrolyte balance becomes unstable.

Most of the time horses will easily recover from exertion. All that is needed is time to rest, proper feed, access to salt (may include an electrolyte supplement) and importantly, access to plenty of water. Nevertheless, if a horse is overworked and/or overheated to a degree that seriously overloads their ability to cool themselves, then their temperature can spike to dangerous levels. If the process is overlooked, their body will begin a chain of events that become progressively more dangerous.

A horse is similar to an all-terrain vehicle with an air-cooled engine. 85% of the heat loss will be through the skin surface and will radiate to the air. Approximately 15% of heat is lost through the respiratory tract, that is, they draw cooler air into their lungs and heat will be dissipated as the horse breathes out.

## **HEAT STRESS FACTORS**

Other than hot weather, factors that contribute to heat stress in horses are:

- Excessive and/or Strenuous Work.
- Obesity.
- Metabolic Conditions – processes that break down and convert ingested substances to energy and nutrients needed.
- Previous history of heat illness or heat intolerance.
- Horse/Pony's Age.
- Long Hair Coats.
- Lack of Fitness – fitness of the cardiovascular and muscular systems. As muscles train for more efficiency, less work is needed to achieve a required level, with less heat generated by the body.
- Inadequate Acclimatisation – it is recommended that 15 to 21 days be used as an acclimatisation period for horses from cooler or drier climates traveling to compete or reside in hot, humid climates. Acclimatisation increases the horse's tolerance to heat and exercise.
- Humidity.
- Prolonged exposure to hot conditions.
- Low air movement or no wind.
- Heavy rugs or full head covering.
- Dehydration – inadequate water intake before and during activities.
- Illness (current or recent illness or chronic heath disorder).

- Transportation – can affect some horses badly while not affecting another. Poorly ventilated, hot horse floats, stress, fatigue, positioning (forward, backward, sideways), position of the head (normally too high and can cause respiratory problems) and physical injuries are contributing factors to overheating a horse during transportation.
- Inability to Sweat (Anhidrosis).
- Heavy Muscling – more muscling means more heat generated but the surface areas does not increase in proportion to dissipate enough heat., and
- Insects – agitation of insect bites can cause an increase in a horse’s core temperature.

## **SIGNS OF HEAT STRESS IN A HORSE**

The following signs may be shown should a horse be experiencing heat stress:

- A high core temperature (over 41°C).
- A heart rate of over 60 beats per minute.
- High respiratory rate (more than 80 breaths per minute).
- Dehydration – Skin Tent Test – take a fold of skin between the thumb and forefinger, lift it away from the underlying tissues, twist slightly and release. A skin fold or “tent” that remains for over two seconds indicates dehydration. A delay of five seconds is serious.
- Fatigue (very tired, lacks focus, becomes inattentive, refuses to work).
- The mucous membranes (above or below the teeth) may feel dry and/or tacky when touched.
- Capillary Refill Time (CRT) is lengthened. Press the horse’s gum above the front teeth (not hard) for approximately five seconds. Release and see how long it takes for colour to return to normal. CRT in a healthy horse should be 1-2 seconds.
- Typically, skin is dripping wet from extra sweat, but can be dry and warm;
- Thumping or jerking of the diaphragm and flanks (in response to the electrolyte disturbances);
- A stiff, odd, abnormal gait;
- Muscle soreness; or
- Cramps (includes spasms and twitching of the abdominal and/or large leg muscles – may appear to have colic).

If heat stress is not treated, neurologic signs like seizures can occur and the horse can experience serious damage to their heart, muscles, and kidneys.

# ORGANISERS

## Essential Aspects

Organisers of any event to be held during hot weather must be fully conversant with the following essential aspects:

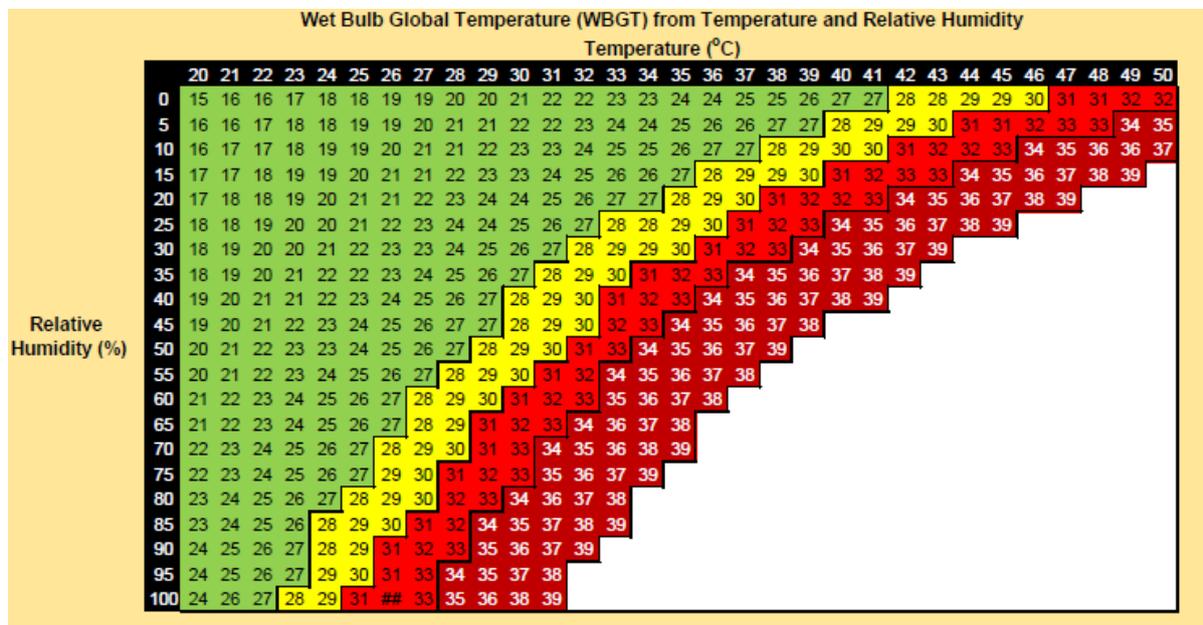
### Humidity and Heat

It has often been said that "It's not the heat, it's the humidity". With regard to the health of humans and horses – it's both. Humans and horses dissipate heat by varying the rate and depth of blood circulation, by losing water through the skin and sweat glands and, as the last resort, by panting. The heart begins to pump more blood; blood vessels dilate to accommodate the increased flow and the bundles of tiny capillaries threading through the upper layers of skin are put into operation. The body's blood is circulated closer to the skin's surface and excess heat drains off into the cooler atmosphere. At the same time, water diffuses through the skin as perspiration. The skin handles about 90 % of the body's heat dissipating function in humans and about 85% in horses.

Sweating, by itself, does nothing to cool the body, unless the water is removed by evaporation. High relative humidity retards evaporation.

### Wet Bulb Global Temperature (WBGT)

The WBGT is a measure of heat stress, which considers temperature, humidity, wind speed, sun angle and cloud cover (solar radiation). Occupational Health and Safety organisations in many countries use the WBGT as a guide to managing workload in direct sunlight and under cloud cover (the more cloud cover, normally the higher the humidity).



The WBGT can also be used as a heat management tool to assess the risk of heat stress in horses. Used correctly it will give a true indication to organisers and drivers as to how weather forecasts can be utilised to prevent or at least reduce the risk of damaging the health of horses and drivers due to undue exposure to heat and humidity.

The table below is a guide for organisers and drivers and recommends certain actions at given WBGT indicators.

WBGT	Example °C / RH%	Recommendations for Competitions
<28	26°C / 65%	Competition conducted under normal guidelines
28 - 30	30°C / 40%	Some precautions will be required to reduce the heat load on horses, for example: <ul style="list-style-type: none"> <li>• If possible, use shaded locations for warm up and competition areas.</li> <li>• Where possible, avoid non-grassed surfaces.</li> <li>• Reduce the horse's work load – increase time allowance; shorten distances.</li> </ul>
31 - 33	33°C / 40%	Those above should be adhered to, but there should also be consideration for: <ul style="list-style-type: none"> <li>• Altering the timing of the event. Events should be conducted at the coolest parts of the day, for example; 7:00 – 10:30am and after 5:00 pm.</li> <li>• In CDEs: <ul style="list-style-type: none"> <li>▪ Take body temperature after the marathon</li> <li>▪ Section A maximum 4 Km</li> <li>▪ Generous time allowance for Section B</li> <li>▪ Generous time allowance and reduce overall distance for Section E</li> </ul> </li> </ul>
>33	34°C / 50%	<b>THESE CONDITIONS ARE AN EXTREMELY HIGH RISK TO HORSES AND COMPETITORS AND ARE NOT COMPATIBLE FOR SAFE COMPETITION.</b> <ul style="list-style-type: none"> <li>• Veterinary consultation will be required before commencing/continuing.</li> <li>• If continuing, consider the appropriate conditions above and: <ul style="list-style-type: none"> <li>▪ In CDE, reduce marathon Section A to 2 Km, no walk and a maximum of 5 hazards in Section E.</li> <li>▪ Generous increase in allowable times.</li> <li>▪ As a minimum, higher exertion activities (High Level Dressage over 6 minutes, Cones, Sections A and E in a marathon) <u>must</u> be conducted in the coolest part of the day – 7:00 – 10:30 am and after 5:00pm.</li> <li>▪ <b>Body temperatures <u>must</u> be taken before and after Section E.</b></li> </ul> </li> </ul>

**In all competitions, the Organising Committee must consult with the Judge at 'C' (for Dressage Competitions), the President of the Ground Jury (for CDEs) or the Event Manager (for all other events) for the proper conduct or cancellation of the event if the WBGT figure reaches 31 or above.**

WBGT information is on the Bureau of Meteorology Website, for each Australian State and Territory with regional indices. To find this information, open the Website at <http://www.bom.gov.au> and in the Search engine in the top right corner, type WBGT. The next page will direct you to your location.

## For Event Organisers

For all events, Organisers **must** provide access to an adequate number of wash bays for entries received (at least have taps and hoses available) with free running water. Along with this, wash buckets and sponges should be made available (be aware of biohazards – competitors should supply their own but there should always be extra) and the location of wash bays should be in a shaded location, if possible. (Under trees is preferable compared to low iron roofing.)

If the WBGT is forecast to be above 31, it is recommended that ice be made available, where possible.

In the event of forecast extreme high temperatures, with or without high humidity, consideration should be given by the Organising Committee to cancel or reprogram the event. This decision should preferably be made before the event starts to avoid undue travelling in the heat by horses & competitors.

## The Six Minute Threshold

The Six Minute Threshold is for horses that have just had a strenuous workout, either being trained or performed, for 6 – 6 minutes 30 seconds, in heat and humidity and are at risk of suffering a dangerous temperature spike and heat overload. When the WBGT is high, then 6 – 6 minutes 30 seconds of continuous hard work can be crucial in causing heat stress. Horses work extremely hard in competition, especially Section E of a CDE, higher level Dressage and during training, consequently heat overload effort may be under 6 minutes. Comprehensive research shows the best way to evaluate the risk is to check the WBGT reading before working the horse, either in training or in competitions.

## Air Flow

The principal cooling process of both horses and humans is the evaporation of sweat. Air flow will significantly increase evaporation. On hot days, typically there will be a breeze early in the morning and another in the evening. On these types of days, events should be scheduled outside of the hottest parts of the day and utilise the cooler mornings and evening with the added bonus of a breeze.

**In temperatures above 33°C, horses standing in the sun, without air flow or shade, start to accumulate heat. Horses working in the sun in temperatures above 33°C, without air flow or shade, are put at risk of heat stress.**

## Arena and Surfaces

Arena surfaces that are soil based and/or exposed to full sunlight will attract a lot of heat. Heat is not attracted and retained as much in a grassed or shady surface.

When tying horses, ensure they are in a shady area away from those surfaces that generate absorbed heat, for example, sand or asphalt.

## Event Planning

A Risk Assessment (available on the ACDS Website) must be conducted by Event Organisers if the days leading up to and during a competition that are forecast to have high WBGT readings. Items to consider include:

- Provision of drinking water for competitors and helpers.
- Provision of shade (for horses and competitor meeting areas).
- Provision of multiple wash bays or at least running water.
- Encourage competitors to provide adequate buckets and sponges for their horse/s.
- Provision of bags of ice (for aggressive cooling).
- Alter the timing for the event (earlier and/or later in the day)
- Reduction of distances and increase in times allowed for each section of a Marathon in a CDE.
- Announcements to drivers and grooms regarding relevant information in relation to heat stress and the event heat policy.
- A Veterinarian (or at least one on call).

## Vital Signs for Horses at Rest

All participants in any training day or event should be aware of the vital signs for horses at rest, including:

- Temperature: 36.5 – 38.5°C
- Heart Rate: 25 – 45 Beats per Minute
- Breathing: 8 – 16 Breaths per Minute
- Capillary Refill Time (CRT): 1 – 2 Seconds
- Hydration Test (Pinch Test): 1 – 2 Seconds
- Clear Eyes
- Normal Stance
- No Nasal Discharge

Information Source: The Biosecurity Glovebox Guide. [www.pip.sa.gov.au/\\_data/.../HorseBiosecurity\\_GloveboxGuide\\_09.pdf](http://www.pip.sa.gov.au/_data/.../HorseBiosecurity_GloveboxGuide_09.pdf)

## **AGGRESSIVE COOLING**

To avoid the downward spiral created by heat stress, the “overheated” horse often requires active intervention from the moment it is recognised to be a problem.

Care would involve the stopping of exercise and cooling the horse by walking (in a shaded area if possible) as well as offering the horse plenty of opportunity to drink. As the horse starts to edge towards heat exhaustion, aggressive cooling measure will become necessary.

Cool to cold water hosing of the head, back, large hindquarter muscles and large blood vessels that travel along the inside of the horse’s hind limb and under the neck will act to quickly dissipate and carry excess heat away from the body. Scrape any excess water off – any water remaining can act as an insulator and actually retain heat. Gentle walking (again, in the shade) will encourage circulation; bringing more heated blood to the surface of the skin for cooling.

Standing the horse up in a breeze, whether natural or created by fans, will increase evaporative losses. If the horse’s body temperature climbs upward into the danger zone of 41°C and higher, douse as much of their body as possible with the coldest water available. Sponge the horse with cold water and apply ice packs to the large vessels along the insides of the hind legs. If their temperature does not come back into the normal range of 38.5°C and the horse is not back to normal eating and drinking readily within an hour, then summon veterinary assistance. It may need intravenous hydration and further measures to support its recovery.

## **ANHIDROSIS**

Anhidrosis is defined as a decreased ability to sweat in response to increased body temperature. Failure to sweat has been found in both horses and humans and it manifests primarily in hot, humid climates. It is of great concern, particularly in performance horses because thermoregulation is mainly accomplished by sweating.

Horses in hard training programs and on high grain diets are more susceptible to develop Anhidrosis, however, it can affect all horses of any age or breed. Pregnant mares and non-working pleasure horses are also prone to Anhidrosis. It normally starts in spring or summer, especially if humidity is high and earlier than normal, thus meaning that acclimatisation adjustments are not routine.

When a horse’s coat is dry or patchy with sweat when worked, some people think it is an indication that a horse is not bothered by the heat. In fact, it should be a cause of great concern and a veterinarian should be called. The horse is showing signs of a faulty cooling system and may suffer heat stroke and collapse.

## CONCLUSION

As a by-product, horses will naturally benefit from the heat produced by their own digestive processes and muscular activity, however, as temperatures rise beyond approximately 24°C and humidity increases, horses struggle to effectively cool themselves and are at a risk of heat stress.

Heat stress and its various forms of distress can be prevented with proper management and conditioning. The most important single factor in preventing heat stress is providing plenty of clean, fresh water and trace mineralized salt to all horses. Sensibility when asking a horse to perform during the heat and a watchful eye for early signs of distress are equally important.

## Acknowledgement

- How Horses Keep Cool – Equus Magazine, 4 June, 2008.
- Caring for Horses in Extreme Heat – The Horse Magazine, 24 June, 2017.
- Heat Stress in Horses – The Horse Magazine, 1 July, 2003.
- Heat Stress in Horses – Kentucky Equine Research, 21 July. 2016
- National Weather Service USA
- Caring for Horses During Hot Weather – University of Minnesota, Krishona Martinson, Marcia Hathaway, Christie Ward, Roy Johnson, Reviewed in 2018
- Cooling the Performance Horse – Hoofbeats.com.au, Wendy Barker
- Heat Stress and Horses – Glacier Farm Media (Manitoba Co-operator), 23 August, 2017, Carol Shwetz.
- Equine Anhidrosis – College of Veterinary Medicine, Florida, USA, Martha Mallicote, 28 February 2015.

## Human Factor – Resources, Advice, Policies and Guidelines

Refer to the Sports Medicine Australia website (hit Control+Click to access document):

### Beat the Heat

<https://sma.org.au/sma-site-content/uploads/2017/08/beat-the-heat-2011.pdf>

### Hot Weather Guidelines

<https://sma.org.au/sma-site-content/uploads/2017/08/hot-weather-guidelines-web-download-doc-2007.pdf>

### UV Exposure and Heat Illness Guide

<https://sma.org.au/sma-site-content/uploads/2017/08/UV-Exposure-and-Heat-Illness-Guide.pdf>