

## ANIMALS

### Hot Weather Management and Action Plan

#### **1. OBJECTIVE**

Under conditions of hot weather, manage and treat animals at your Agricultural Show to avoid or reduce heat stress.

#### **2. GUIDELINES**

- 2.1.** A person nominated by your Show Society must carry out regular assessments of animal exhibit pavilions and in consultation with your Show Society approved person and implement necessary actions in the event of hot weather conditions to manage ongoing risks.
- 2.2.** A person nominated in charge by your Show Society must have a Hot Weather Management Plan document available and they should record daily environmental conditions within that document.
- 2.3.** Hot Weather risk assessments should include:
  - Site climatic factors using a Wet Bulb Globe Temperature thermometer or other recording devices.
  - A qualified person to identify at risk animals.
  - Reports given by a Show Society approved person.

#### **3. CAUSES OF HEAT STRESS**

Heat Stress occurs when a combination of local environmental conditions and animal factors lead to an increase in body temperature beyond the animal's ability to cope. The ability to dissipate heat can be lessened or diminished by a mix of the following environmental factors:

- Recent rainfall
- High ongoing relative humidity
- An absence of cloud cover with a high solar radiation level
- Minimal air movement over an extended period
- A sudden change to adverse climatic conditions

Certain characteristics of an animal make them less tolerant to heat than others. These characteristics may include:

- Dark colour coat
- Thick textured coat
- Heavier breeds with a higher fat percentage
- Animals not accustomed to high humidity
- Animals moved from one climatic zone to a Show situation in a significantly different climatic zone.

#### **4. SIGNS OF ANIMAL HEAT STRESS AND DISTRESS**

Heat stress is caused by three factors: humidity, temperature, and air movement. High humidity impacts an animal's ability to cool down by sweating and panting. Therefore, heat stress can occur at lower temperatures on days of high humidity. Air movement can assist an animal to cool as can providing cooler air.

## **HORSES**

The following peak bodies have hot weather policies for horse competitions that AgShows NSW recommends shows follow in the case of extreme heat:

### **EQUESTRIAN AUSTRALIA**

[http://www.equestrian.org.au/sites/default/files/EA\\_Hot\\_Weather%20Policy\\_26092017.pdf](http://www.equestrian.org.au/sites/default/files/EA_Hot_Weather%20Policy_26092017.pdf). Follows the Web Bulb Temperature guidelines (see below)

### **PONY CLUB AUSTRALIA**

[http://www.pcansw.org.au/docs/general/41/pca\\_hot\\_weather\\_final\\_draft\\_may\\_2017.pdf](http://www.pcansw.org.au/docs/general/41/pca_hot_weather_final_draft_may_2017.pdf). Follows the Web Bulb Temperature guidelines (see below)

Horses cool themselves efficiently by evaporative cooling. As sweat and water molecules evaporate from the skin these molecules absorb and remove body heat causing the horse to cool. Heat stress after exercise is most likely to be seen on days when both the ambient temperature and relative humidity are high, and wind speeds are low or absent. Signs of heat stress include:

- Increased respiration rate
- Increased heart rate
- Flared nostrils
- Staggering gait/weakness
- Agitated and distressed appearance
- Irrational behaviour such as lashing out with hind limbs
- Loss of appetite
- Excessive sweating

## **CATTLE**

Days with temperatures in the high 30s may have negative outcomes for cattle and intensive cooling strategies are required.

Calves, pregnant cattle, and dairy cattle (see *Dairy Cattle*) are more at risk of heat stress due to their lower heat threshold, as are animals with a history of respiratory disease due to a decreased ability to dissipate heat through panting. For Dairy cattle, high milk producing cows are more sensitive to heat stress (e.g. Holstein-Friesian).

Cattle do not perspire and therefore regulate body temperature in other ways. If conditions are hot and humid, their body temperatures will peak in the late afternoon and early evening hours. Signs of heat stress include:

- Panting, open mouthed breathing
- Excessive salivation
- Lack of coordination
- Trembling
- High rectal temperature (> 40°C)
- Increased heart rate
- Loss of appetite

*General Preventative Cooling Measures* should be employed such as:

- A plentiful supply of clean, cool water and shade is essential

- Minimal handling of cattle at high temperatures.
- Shows should make sure that any cattle judging is done in the cool of the day and that cattle have access to water and water pools to stand in
- If adequate shelter does not exist; consideration should be given to erecting temporary shade access
- Stocking densities of pens and sheds should be reduced to ensure good air flow between animals.
- Crowding around water sources can be an issue. If possible, more than one water source should be provided.
- Exhibitors should be advised to only transport animals during the cooler hours of the day.

## **SHEEP**

### **Provision of shelter for sheep**

Healthy sheep can tolerate a wide range of temperatures if they are acclimatised and have adequate feed and water.

Animals must be provided with shelter in times of above or below average temperatures. This can minimise the impact of climatic extremes and prevent suffering or possibly death. Periods of extreme heat can cause heat stress, with lambs again more susceptible than adult sheep. Heat stress can reduce productivity, cause reproductive problems such as reduced semen quality and lower birth weights, and compromise the immune system.

### **Hot weather**

While the Merino is better adapted to hot and shadeless conditions than British breeds, all sheep experience heat stress to some degree on days of above average heat. Sheep cool themselves primarily by increasing their respiration rate and can also lose a small amount of heat through sweating. Heat stress and exhaustion should not occur if sheep are able to find shade and rest during the hottest part of the day.

Lambs and pregnant ewes are more at risk of heat stress due to their lower heat threshold, as are sheep with a history of respiratory disease due to a decreased ability to dissipate heat through panting.

Wind flow is important for keeping animals cool and should be considered when deciding the type and location of shelter. Shelter should also be provided to recently shorn sheep to prevent sunburn.

### **Shelter suitable during hot weather**

The best type of shelter during extreme heat protects animals from the sun and allows for the cooling effect of the wind. An option for shelter in hot weather is to construct shelters using materials such as shade cloth, corrugated iron or timber. It is important that sufficient shelter is available for all animals at the same time to prevent sheep crowding and smothering. It is preferable that all animals can lie down as this helps them cool themselves.

### **Water**

The importance of clean fresh water during periods of extreme heat should not be underestimated. An adult sheep requires an average of two to six litres of water a day, and up to 80 per cent more on days over 35°C. Wool protects sheep from extreme heat as wool fibers dissipate heat more rapidly. Signs of heat stress include:

- Rapid breathing
- Lack of coordination
- High rectal temperature (>40°C)
- Increased heart rate
- Loss of appetite
- An inability to stand

## **GOATS**

Goats experience heat stress at temperatures above 30°C.

General preventative cooling measures should be employed as well as adequate shelter and water be provided to goats in hot weather and handling kept to a minimum.

Refer to sheep for more information.

## **ALPACAS**

Alpacas are particularly susceptible to heat stress and cooling efforts should be planned for in hot weather. Cooling efforts could include:

- **Shade** - Keeping alpacas out of direct sunlight will assist in reducing heat stress.
- **Water** - Heat stressed alpacas will readily accept being sprayed with cool water. Wet down legs, belly, tail and front of the neck all the way to the skin. If not wet to the skin, the layer of wet wool may treat heat and make the animal hotter. Spraying with cool water does not damage the fibres.
- If practical, alpacas may benefit from standing in baby pools. However, hosing down legs with cool water can assist them with cooling. Misting may cause fleece to matt and inhibit the animals ability to lose heat.
- Alpacas have been known to sit down in water buckets during hot weather or guarding it to prevent others from drinking. Multiple water buckets in various areas can assist with this problem. Note that alpacas who lie down in water may damage the fibres below the waterline.
- Misting, while effective for cooling is inefficient for alpacas as it can trap heat close to the skin, rather than release it.
- **Sand** - Damp sandy soil in a shaded area can provide a cooling means for alpacas to stand and lie on.
- **Air** - Airflow is critical to cooling alpacas. Fans will help cool alpacas by increasing air flow and when coupled with cool water, as mentioned above, can be a highly effective method.
- **Excessive Handling** - Alpacas can become stressed by handling if they are unaccustomed to it. Competitions should be arranged to keep handling to a minimum.
- **Transport** - Transporting alpacas during the hot weather can be very dangerous. Trailers do not insulate from the heat coming off the road or from the sun beating down. Alpaca competitors should be advised to travel during the cool hours and maintain air flow and stop for water.

## **PIGS**

Pigs are highly susceptible to heat stress and should not be exposed to long periods of extreme temperatures. Pigs are unable to sweat and cool themselves by increasing water intake, lying on a cool surface, panting, and reducing their feed intake. Pigs are also prone to sunburn.

Signs of heat stress include:

- Panting, open mouthed breathing
- Lack of coordination
- Trembling
- High rectal temperature (> 40°C)
- Increased heart rate
- Loss of appetite
- Inability to stand

During very hot weather (35°C or more) adult pigs are **very** susceptible to heat stress, and steps should be taken to alleviate distress and avoid deaths. Lactating or pregnant pigs are particularly susceptible to heat stress and heat stroke. Pigs may die if loaded for transportation in very hot conditions.

General preventative cooling measures such as water application followed by increasing airflow, provision of ice blocks as a lick, access to wallows or mist sprays should be employed for a pig showing signs of heat stress.

Note: It is not advisable to hose down a hot pig with cold water; this can cause shock to the system. If a pig is over heated, cool down their feet first by providing them with some water to walk in or by hosing their feet.

### **DOMESTIC ANIMALS (Including DOGS)**

Please refer to Dogs NSW regulations on hot weather management for dog competitions  
[http://dogsnsw.org.au/images/Part\\_02\\_Show-November\\_2017-2.pdf](http://dogsnsw.org.au/images/Part_02_Show-November_2017-2.pdf).

Heat stress in domestic animals occurs when the heat generation exceeds the body's ability to dissipate heat. Small animals including rabbits, guinea pigs, ferrets, birds, rats, and mice are highly susceptible to heat stress. Signs of heat stress include:

- Excessive panting (dogs)
- Open-mouth breathing (cats)
- Muscle cramps/tremors
- Mucous membranes that are a deep red colour/or pale and dry.
- Weakness
- Excessive salivation
- Loss of appetite
- High rectal temperature (> 40°C)
- Stretching out on the floor or bench (Rabbits)
- Lifting wings away from the body (Birds)

### **POULTRY**

Poultry are particularly susceptible to hot weather. Hens that are heavier should be monitored. Hens exposed to temperatures 29-35°C will require heat management measures.

General preventative cooling measures should be employed such as:

- Hosing down roof housing hens
- Cool water misting
- Fans
- Lots of drinking water
- In severely heat affected birds, it may be necessary to place them in shallow tubs of cool water

In temperatures up to 37°C heat exhaustion is highly possible and egg production will suffer. Temperatures over 37°C bird survival is a concern and intensive cooling management should be employed.

Poultry should not be wet down unless there is a breeze to aid the cooling process.

Birds can adapt to a wide range of temperatures (approximately 5°C - 30°C), however, the heavier meat

chickens and breeder birds may experience high levels of mortality if exposed to sudden and large fluctuations in temperature and humidity. Signs of heat stress include

- Heavy panting
- Lifting wings away from the body
- Darkened skin colour due to blood being pumped in the skin

### **FARMYARD NURSERY**

As per the species above.

### **HEAT TREATMENT FOR ANIMALS**

#### **5. TREATMENT EQUIPMENT** kept at your Show Society office.

- Ice bags/packs in freezer for aggressive cooling
- Body scrapers to remove excess water
- Towels for cooling
- Buckets
- Thermometer
- Shaded area
- Fans
- Water bowls
- Spray bottles for misting
- Extra hoses
- Sprinklers

#### **6. TREATMENT FACILITIES**

- Wash bays with freely running water via hoses
- Undercover and/or ventilated areas
- Pavilions with adequate fan equipment for ventilation
- Shaded areas with a breeze avoiding bitumen areas where possible.
- Introduction of additional cooling systems such as fans.

#### **7. TREATMENT OPTIONS** including shutdown procedures

Clinical assessments by your Show Society personnel of all animals are essential before the best option is chosen. Decisions must be made in consultation with the Head Steward of animal species. Various options are listed below but are not limited to:

- Withdraw the individual animal from competition/display and treat/cool the animal in its normal housing.
- Withdraw the individual animal from competition/display AND move the animal to a new location better suited to reducing heat stress such as an air-conditioned room or treatment room.
- Stop general public entry to the pavilion on the day in order to reduce additional stress BUT allow the animal competitions to continue privately. Ensure that cool ventilation is not closed off.
- Stop general public entry to the pavilion AND cancel/postpone any competition/display for that day. Remove all animals from the pavilion AND relocate all animals to a new pavilion /quarantine hospital/Main Arena OR provide the option for exhibitors to leave the showground early with their animals if necessary.

## 8. OTHER CONSIDERATIONS

- Double check that cool, clean water is available.
- Only under veterinary recommendation (if available), add ice to drinking containers.
- Only under veterinary recommendation (if available), some species can be sprinkled with water for cooling. Do not sprinkle wool producing animals because if the wool becomes wet, the air cannot flow properly over the skin for evaporative cooling
- Under veterinary recommendation (if available), spray the animal with a spray bottle or in extreme cases; briefly sit the animal enough in water if practical.
- Provide sprinklers with large droplets; misters only contribute to the humidity; do not use misters as they increase the humidity
- Ensure the onsite veterinarian (if available) monitors the exhibits for signs of heat stress throughout the day.
- Introduce monitor sheets for staff to document that all animals are checked.
- Reduce the time that animals are waiting for an event to begin.
- Prudent PA announcements should be made advising exhibitors/general public of the situation following discussion with your show society authorized persons
- Ensure that pavilions that have louvres have them opened ahead of the Show beginning
- Extra fans are available if required

### **TEMPERATURE MEASUREMENTS**

#### **Temperature Humidity Index (THI)**

Wet Bulb Temperature considers humidity and temperature together. Wet Bulb Temperature is used by peak bodies such as Equestrian Australia and Pony Club Australia. Measurements for regional areas of NSW are available at <http://www.bom.gov.au/products/IDN65179.shtml>. For dairy cattle the Thermal Humidity Measurement is used which can be seen under Dairy Cattle in this document.

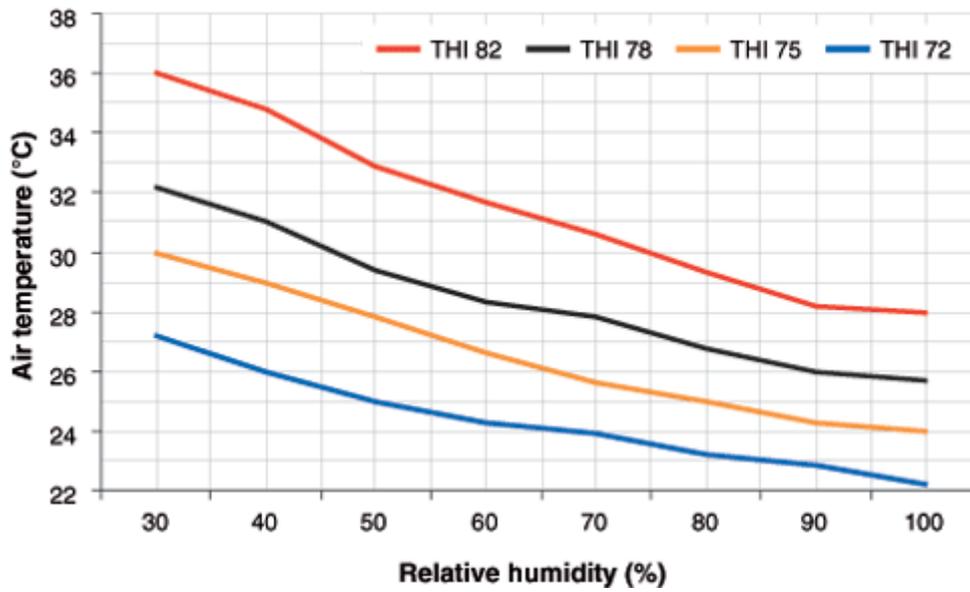
**Wet Bulb Temperature** measurements for regional areas of NSW are available at <http://www.bom.gov.au/products/IDN65179.shtml>.

Temperature Humidity Index (THI) accounts for the combined effects of environmental temperature and relative humidity and is a useful and easy way to assess the risk of heat stress. Please see the graph below:

- When the THI exceeds 72, cows are likely to begin experiencing heat stress.
- When the THI exceeds 78, cows' milk production is seriously affected.
- When the THI rises above 82, very significant losses in milk production are likely, cows show signs of severe stress and may ultimately die.

A number of important points should be made about the THI:

- THI does not account for solar radiation or air movement – those two factors, along with air temperature and relative humidity, determine the heat gained and lost between the animal and the environment.



For example, a THI of 78 occurs at:

- 31°C and 40 % relative humidity; or
- 27°C and 80% relative humidity