

PREVENTING HEAT STRESS WHEN RIDING IN HOT WEATHER

By Heather Smith Thomas

Heat stress, heat exhaustion and heat stroke are terms that refer to dangerous conditions that may occur when mules or horses are overworked in hot weather. Extremely hot weather is most likely to be life threatening when the animal is exerting (creating more body heat) or being hauled in an enclosed trailer/van with inadequate ventilation. Some horses are more likely to suffer heat stress than are mules, just because they tend to be more “hyper” and may keep going even when they shouldn’t. A mule tends to conserve energy and is less apt to overdo himself. But any animal—mule or horse—pushed beyond his capabilities and fitness, especially in hot weather, may suffer heat stress.

Barney Fleming, DVM (Custer, South Dakota) vets endurance rides around the U.S. and has seen many heat-related problems in hard-working animals. He says the danger for heat stroke can be minimized by proper care and conditioning of the horse or mule. Every rider should know the signs of trouble, and be aware of subtle changes in his/her mount to be able to stop riding and reverse the condition before it’s too late.

HOW THE BODY DISSIPATES HEAT

“The heat the body must get rid of comes from metabolism, muscle contractions and energy production. Equines can eliminate heat several ways,” says Fleming. Just like humans, they cool themselves mainly by sweating, but also via respiration—dissipating heat from the lungs. “The lungs have a huge surface area inside. The horse or mule blows hot air out and draws in cooler air that absorbs heat, and blows it back out. He also flares his nostrils, to aid that process. If his nostrils are flared, he’s attempting to get rid of heat,” explains Fleming.

“There are some individuals that don’t sweat much, or sweat in patches, and this makes them more prone to overheating. When sweat evaporates from the body surface, it cools. The animal sweats in order to cool off, but if he loses too much fluid from sweating during the ride, he dehydrates—and that leads to problems,” he says.

One difference between humans and equines is that temperature can vary more



widely, with a larger range of safety, in horses and mules. “Their temperature can safely be between 99 and 103 and they’re not in trouble. Between 103 and 104 is borderline.”

CONDITIONS THAT MAY LEAD TO HEAT EXHAUSTION

“If his temperature continues to climb, this is when he gets into trouble. If his temperature gets up to 106-107 degrees it can’t stay there long or the condition becomes irreversible,” explains Fleming.

Factors that can increase risk include high humidity during hot weather. When the air is full of moisture (humid) instead of dry, evaporation rate slows or ceases, and there’s no cooling effect of sweat. The body just stays wet and hot.

“If air is dry you get a swift cooling effect; sweat comes out hot, dissipates into the air (taking heat with it), and that cools the body surface. If it can’t evaporate because the air is already full of moisture, it just sits there on the skin, hot. The moisture becomes insulation, holding heat in rather than dissipating it,” he says.

The body doesn’t cool, and signals for more sweating. Sweat may cover the body and run off in streams because it can’t evaporate. The animal is wet but doesn’t become cooler. If he continues to work, he quickly dehydrates and overheats.

In an arid climate, by contrast, sweat evaporates almost as fast as it is produced, constantly cooling the body. And if you put water on the animal to help him cool, it evaporates quickly. But on a hot humid day

moisture just sits there, and you have to scrape it off, to take any heat with it. “You put the cool water on, and take the warm water off; then put more cool water on, etc.,” he explains.

“In areas with high humidity, you must help the animal get rid of the heat, by getting rid of the water. In the arid West, however, if air is dry and there’s a breeze, it evaporates so fast you don’t even see the sweat. This is an ideal situation, because the horse or mule will cool very well,” says Fleming.

Be aware of weather conditions and weather predictions, especially heat/humidity index. Don’t work the animal hard when temperature and relative humidity together are dangerously high. A rule of thumb: when temperature and humidity numbers are added together and the total exceeds 130 (as when it’s 80 degrees with 50 percent humidity) there is risk of overheating. If the total gets up to 150 or higher, any working horse or mule will probably overheat. If temperature is 90 he may get in trouble even if humidity is only 40 to 50 percent, and may also be in trouble if it’s only 75 degrees and humidity is 75 percent. When humidity is high, he is unable to cool himself.

Another factor that influences overheating is body mass. Large, fat, or heavily muscled animals and heavily pregnant mares don’t dissipate heat as well as small, lean ones. “Quarter horses, draft horses, or any big heavy horse or mule will overheat much faster than a trim, well conditioned Arab, or a little mule. A lot of pleasure riders like to ride Quarter Horses, but they are more likely to overheat,” he says.

SIGNS OF HEAT STRESS DEHYDRATION

If the body’s methods for regulating heat have not kept pace with heat accumulation, the animal becomes weak and “exhausted.” When he runs out of body fluid for sweating, dehydration complicates the process of heat regulation. “He can’t sweat anymore, or sweats at a very reduced rate. This greatly increases the risk for heat stroke,” says Fleming. The animal’s temperature will shoot higher.

The “pinch test” is a clue to how dehydrated he is. Skin becomes less elastic due to fluid loss from underlying tissues, and a pinch of skin pulled out from the neck or point of shoulder will not spring back into place but stays tented a few seconds. If it takes two or three seconds for the skin to sink back into place, the individual is moderately dehydrated and has probably lost at least four gallons of fluid. If the pinch of skin stays elevated six seconds or longer, he is severely dehydrated.

Mucous membranes in the mouth (such as gums) become dry and discolored, turning brick red instead of healthy “bubble gum pink”. Heart rate increases as the body tries to pump more blood to the surface for cooling, but has less body fluid to do it. The eyes seem sunken; eyelids and tissues around the eyes are more wrinkled, due to loss of fluid in the tissues. What sweat the animal does produce will be thicker and sticky instead of clear and watery. Capillary refill time is longer than normal; if you press your finger into his gum, blood does not rush right back afterward. That spot where you pressed out the blood stays pale for several seconds.

His pulse and respiration rate may remain high in spite of rest. His pulse may be weak, heart rhythm may be irregular, intestinal sounds may be diminished or absent (the gut has stopped working) and the muscles of his anus may become relaxed and floppy; the anus sags open.

Important salts have been sweated out with the fluid, creating critical changes in electrolyte balance of the body. This can interfere with nerve signals since electrolytes are crucial for proper nerve and muscle function. Erratic nerve signals can contribute to digestive tract malfunction, irregular heartbeat, muscle cramps, etc. Some animals, for instance, will develop “thumps” (the abdomen jerks each time the heart beats).

The dehydrated animal will be depressed, and won’t have much interest in eating or drinking. If a tired horse or mule will eat, this is always a good sign. Green grass is the best feed for a tired/dehydrated animal. **DO NOT** feed grain.

An alert rider can begin to sense subtle signs of fatigue before his/her mount is in trouble. If you stop working the horse or mule at the first signs of weariness, and take time to let him drink and cool out, the condition won’t progress to the point of heat exhaustion or heat stroke. Check his pulse and respiration periodically during and after a

ride. Take his temperature to see how overheated he is and how quickly he recovers. If the animal suffers heat stroke, rectal temperature may rise as high as 106 to 110 degrees. Skin will be hot and dry, since he has run out of fluid for sweating. He may be oblivious to his surroundings, and has difficulty moving. Unless the condition is quickly reversed he will collapse, go into convulsions or coma, and die.

DEALING WITH A TOO-HOT ANIMAL

If the horse or mule is mildly overheated, halt your ride and remove the saddle. Sponge him with water, especially over the major blood vessels, and provide shade. Walk him in a big circle if there’s a breeze, to cool him on all sides. Once he seems cool, check him again 15 minutes later, and again 30 minutes after that. If he is not completely cooled out (temperature still elevated, body retaining internal heat), he’ll break out in a sweat again. If that happens, walk and cool him again. After any strenuous workout in hot weather, check him again several hours after you’ve cooled him, since some animals may also be at risk for colic after working in the heat.



Cooling after a ride.

If the horse or mule is severely overheated, stop riding as soon as he starts showing signs of trouble and move him into the shade if possible. Call a veterinarian to administer large volumes of IV fluids to restore what’s been lost and to help restore proper blood circulation. While waiting for the vet, try to lower his temperature. Keep air moving around him with fans, or manual fanning. One of the quickest ways to cool him is to put cold water where major blood vessels are close to the surface—like the jugular groove.

“Keep the jugular groove wet with cool water—sponge it on, sponge it off, sponge it on, etc. Another good place to keep wet is the big blood vessels on the belly. These are very close to the surface, to dissipate heat,” says Fleming.

Don’t wet the whole animal, in an arid

climate. If you chill the big muscles, they’ll contract and constrict the blood vessels, hindering dissipation of heat. “In the East, where humidity is always higher, you can pour water over the whole animal and get away with it, or pour cool water over his big muscles, because it’s not evaporating very fast. The big muscle masses have a lot of heat in them and it needs to be dissipated. But in low humidity don’t speed heat loss too much or the animal will cool too fast,” explains Fleming.

In a humid climate, keep applying cool water all over the animal and keep scraping it off, since the water warms up immediately on the body. After a short session of cooling, walk him briefly then apply cool water again. Keep alternating walking and cooling, since moving helps promote blood flow to the skin and air movement aids evaporation (unless humidity is too high for evaporation). Keep checking his temperature. It should drop about two degrees within ten minutes. Once it starts to drop, slow down on the cooling. Stop using cold water as soon as his temperature comes down to 101, or when skin over his hindquarters feels cool after a walking period, or when his respiration rate drops below 30. Definitely stop if he starts to shiver; this means you’ve gone too far with the cooling.

“Continually monitor him. Once his temperature starts dropping, slow down on whatever it is you are doing to cool him, or you may go too far and get a collapse of the blood vessels, and put him in worse shape,” says Fleming. Don’t use ice packs over the muscles. This constricts surface blood vessels and hinders blood flow to the skin, which retards the cooling process. If you use wet towels over the neck or head, continually pour cold water on them. A wet towel left in place without constantly adding cold water will soon warm up and act as insulation, retaining heat.

The legs have a lot of blood vessels close to the surface. “Wetting the legs with cool water, including the feet, can help cool an overheated animal. If there’s a stream nearby, walk him into the stream. Stand him in the water and use water to keep his jugular vein and abdominal veins wet and cooling. A lot of blood goes through the feet,” says Fleming.

Overheating can be a serious problem, but caught soon enough it is very easily corrected. “If you halt all activity, you are stopping the production of heat, and then all you have to do is get rid of it,” he says. But if



you keep pushing the animal to go farther, you may push him over the edge.

SIDEBAR: FACTORS THAT MAY LEAD TO HEAT STRESS - Heat and humidity, lack of fitness and proper conditioning for the work being done, steep terrain if the animal is not accustomed to climbing, high altitude if the animal is not adapted to working at high altitudes, inability to sweat, rider inexperience (not knowing when to give the animal a rest, presence of disease or lameness, which adds to stress

SIDEBAR: TIPS TO AVOID OVERHEATING – Always make sure the animal is fit enough for the work. Gradually increase the length and challenges of his rides (such as working in steep or rough terrain) before you ask him to do a hard ride in the heat. A fit horse or mule has more endurance and also a much more efficient cooling system than a soft, out-of-shape animal. Even so, avoid doing a long or strenuous ride during a heat wave or during the hottest part of the day. Ride early in the morning or late evening if possible. Mornings are usually best because the air is not as warm and humid.

Since dehydration (from sweating) is a big factor in heat exhaustion, make sure the animal always drinks plenty of water. Let him drink at every stream or water source you come to. Drinking while he is hot and working hard will not cause colic or founder, as long as the water is not ice-cold and the animal will be continuing on after drinking. If he takes a big drink of cold water, it may cause gut cramping, especially if he is just standing around afterward. If the only water available when you come home from your ride (or back to camp) is ice cold (such as a mountain stream), fill some buckets before you leave, so the water can warm up before the horse or mule comes back to drink. If the only water sources along your way are cold streams, don't let him tank up. Allow him many opportunities to drink, without overloading on cold water.

You want him to drink as much as possible during the day's work. "The more he drinks, the more he replenishes his reserves for sweating, and the more urine he produces," says Fleming. "The more he urinates, the more heat is removed from the body. The urine is coming out of the body core (which is hottest) and bringing a lot of heat with it. Seeing the animal urinate is always a good sign." Not only is this removing heat, but it also means he is not dehydrated.

Don't feed grain or high protein feeds during hot weather. Grain produces more heat in the muscles and protein produces extra heat during digestion. Animals working hard in hot weather do best on a diet of grass hay (rather than rich alfalfa) and a minimum of grain. "For every pound of roughage the animal eats, he'll take in 10 pounds of water," says Fleming. The roughage acts as a big sponge, making the gut a large storage vat for fluid and the animal won't dehydrate as quickly.