HEAT STRESS IN THE HORSE

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The horse produces body heat through exercise, digestion of food and other metabolic processes. The circulatory system transports the heat from the central area of the body to the skin and respiratory passages. Once the heat reaches the skin and lungs it is lost via heat waves transferred from the body; transfer of body heat to the sweat and evaporation.

The body temperature is maintained within narrow limits by a thermoregulatory system within the brain. A failure to maintain this temperature within normal limits can result in altered function of the brain and nervous system. This altered function, if continued, can cause the animal to collapse. An untreated horse suffering from heat stress will sometimes die.

This thermoregulatory center in the brain controls behavioral and physiological mechanisms to return the body to its ideal temperature. When the body temperature is too low the animal will shiver to increase heat production. On the other hand, when the body temperature exceeds the upper limit allowed by the control center the animal will lose heat through sweating and also through dilation of blood vessels. Sweating is the primary method of thermoregulation in the horse.

The first mechanisms of heat loss (body heat waves production and transfer of body heat to sweat) require a favorable temperature difference between the horse and the environment. Exercising a horse in cool weather allows these mechanisms to remove heat. However, as the environmental temperature increases these mechanisms become ineffective. Heat stress can also occur when a horse from a dry climate is suddenly exposed to a hot humid climate. Transportation in an overheated, poorly ventilated trailer will also cause heat stress. Extended exercise in a hot or humid environment will cause heat stress. High humidity interferes with sweat evaporation and contributes to heat stress.

Performance horses will lose large volumes of sweat (5 to 10 liters) during a one mile race. The amount of fluid and electrolytes lost, in addition to heat stress, can have severe effects on the horse. Dehydration will slow down the ability to sweat and thereby cool the body. Dehydration can be a major factor in developing heat stress.

Horses suffering from heat stress exhibit a variety of symptoms. Initially the horse may be depressed with little interest in food or water. The respiratory rate may also be elevated. After exercise the horse with heat stress can appear restless, anxious or even more depressed. These horses may sweat profusely and have elevated heart rate and respiratory rate. Rectal temperatures can reach 105 degrees Fahrenheit or more. Left untreated the horse may become

disoriented, collapse and perhaps die. Horses exhibiting the severe signs of heat stress are a medical emergency.

Emergency treatment the owner can perform prior to the veterinarian's arrival starts with a cool water bath to control and begin reducing the horse's body temperature. Alcohol can be added to the water to promote faster evaporation and cooling. The cool water should be applied over the large vessels of the legs, head and neck.

The veterinarian often takes blood samples to determine which electrolytes should be supplemented to the intravenous fluids. These initial blood samples also determine the degree of dehydration. Usually horses suffering from heat stress are low in sodium, chloride and potassium. A venous catheter can be placed and aggressive fluid therapy initiated. Once re-hydration is begun, the veterinarian can administer antipyretics to help reduce the fever. Oral water supplementation should be given by small frequent sips from a bucket. Oral electrolytes can be given to help replace sodium, chloride, and potassium loss.

SYMPTOM	MILD	MODERATE	SEVERE
RECTAL TEMPERATURE	102 – 103 F	103 – 105 F	MORE THAN 105
HEART RATE	50 – 60 / MIN	60 – 80 / MIN	MORE THAN 80
RESPIRATION	30 – 40 / MIN	40 -50 / MIN	MORE THAN 50
GUM COLOR	SLIGHTLY DARK PINK	DARK PINK / MAROON	DARK RED / PURPLE
BODY SURFACE	VEINS "POPPED"	BULGING VEINS	BULGING-LUMPY VEINS
SWEAT	FILM OF SWEAT	BODY WET SWEAT DRIPS	SWEAT DRIPS OR MAY STOP SWEATING
BEHAVIOR	DEPRESSED	STUMBLING	STAGGER / FALL
ACTION PLAN	REST IN SHADE REMOVE TACK SPONGE OR HOSE OFFER WATER	SAME AS MILD BE READY TO CALL VET!!	SAME AS MILD CALL VET NOW!!!!!!!!!!