



USE SHADE

TO COMBAT HEAT STRESS IN ANIMALS

Scott Cotton

Research has shown heat stress can have many detrimental effects on animals.

Heat stress in cattle reduces feed intake, lengthens intervals between estrus cycles, and can reduce fertility, according to research at the University of Kentucky and Iowa State University.

The best-case scenario on hot days for all animals is a shaded area with vegetation underfoot, a light breeze, plenty of cool water, and feed provided in the late afternoon or early evening.

Causes of heat stress

Heat stress is caused by a combination of environmental factors, animal characteristics, and some management issues.

Heat stress peaks when high temperatures combine with high humidity levels. These reduce an animal's ability to dissipate heat within its body by convection, conduction, or evaporation. This combination, referred to as the Temperature Humidity Index (THI), is usually more of an issue in areas with higher humidity and less wind than the arid West but can occur anywhere. You can find THI Heat Stress Forecasts from the USDA Agricultural Research Service and NOAA at <http://bit.ly/heatstressforecast>.

Animals have varying capability to deal with heat stress based on genetics, access to shade and water, and their feeding schedule.

Genetics, age, and health play a role

Various genetic traits can make an animal more or less adapted to cope with high heat levels. Using cattle as an example – a Brahma crossbred cow with light-colored, thin skin and long ears with extra blood vessels close to the skin surface – has the ability to cope with higher heat levels than a classic Black Angus cow. The same principle occurs with lighter-haired, lighter-colored dogs compared to dark-colored and double-furred canine species such as Huskies.

Along with genetics, health and age can affect an animal's ability to cope.

Tactics to help animals cope

In general, if the outside temperature is over 75 degrees in humid areas or over 80 degrees in dry areas, then start watching for and making a plan to deal with heat stress. Bear in mind if overnight temperatures stay 71 degrees or above, all animals will have a harder time compensating the next day.

Feeding time can make a difference to animals

Remember that the temperature of animals may lag that of the air temperature. Most animals generate internal heat as they process feed. In cattle this heat generation peaks at six to seven hours after feeding. Feeding cattle at a time so their internal heat generation does not coincide with peak daily environmental temperatures is suggested. Feeding cattle in the late afternoon or early evening would have their internal heat peak long after the temperature highs for the day.

Access to cool water helps

Cattle can tolerate higher THI without adverse effects if they have sufficient access to cool water to drink and possibly wade in. Most animals increase their water needs by as much as 30-80 percent when temperatures go above 75 degrees. If the species is a herd animal, they must be able to access the water in groups. This requires a larger watering area (bigger diameter water tank, etc.).

A shady hangout and cool surfaces provide relief

Shade for any animal species can dramatically reduce heat stress by reducing solar exposure, cooling their body, and cooling the surface they stand or lay on. Shade also can



Shade is an obvious answer to reducing heat stress.

keep water cooler, adding to the water's cooling benefits and attracting animals to the water. This natural reaction is one that causes livestock grazing in the arid West to be drawn to riparian areas where both shade and water benefit them, especially in the heat of the day. Unfortunately, they tend to linger in these areas longer and eat the forage there at an enhanced rate. Wildlife do the same. This can reduce the vegetation in these areas over the long-term, so some access management may be required.

Standing on any vegetation, especially cool, green vegetation, also reduces heat stress, while standing on pavement or bare ground can reflect heat and double its impacts.

Shade structures can be portable mechanical shades or lines of trees planted in a manner so animals stand on opposite sides of the trees at different times of the day (as the sun moves across the sky).

Shade cloth, which blocks 40-80



Plant trees so animals can stand on opposite sides of a shade tree as the sun moves across the sky.

percent of solar radiation, can reduce body temperatures by as much as 10 degrees on 80 degree days. This cloth is fairly inexpensive, can be stretched across movable frames, and still allow air movement through and around the shade.

When animals are handled makes a difference

Handling or moving heat-stressed animals can compound heat effects. Carrying out these activities in the cooler parts of the day can reduce impacts.

North Dakota State University factsheet *Dealing With Heat Stress in Beef Cattle*, No. AS1615, and the University of Kentucky Factsheet AEN-99 *Shade Options for Grazing Cattle* are excellent guides to heat stress management that apply to many species.

A special note: Heat regulation for a species that has to pant to cool itself is dramatically enhanced by access to cool vegetation and shade.

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