Cooling off Heat Stress

Managing for heat and humidity can help reduce stress in the cow herd.

by Heather Smith Thomas

The sultry, dog days of summer will soon sweep across many regions of the United States. Preparing for high temperatures can help minimize heat stress in your herd.

Don Spiers, professor emeritus at the University of Missouri (MU) has worked with cattle for many years, looking at heat stress. He says large animals have more trouble dissipating heat than smaller, leaner animals. Dark-colored animals and those with the most insulation, or body fat, have the most problem with heat.

Heat combined with high humidity can be a deadly combination.

Minimize heat stress

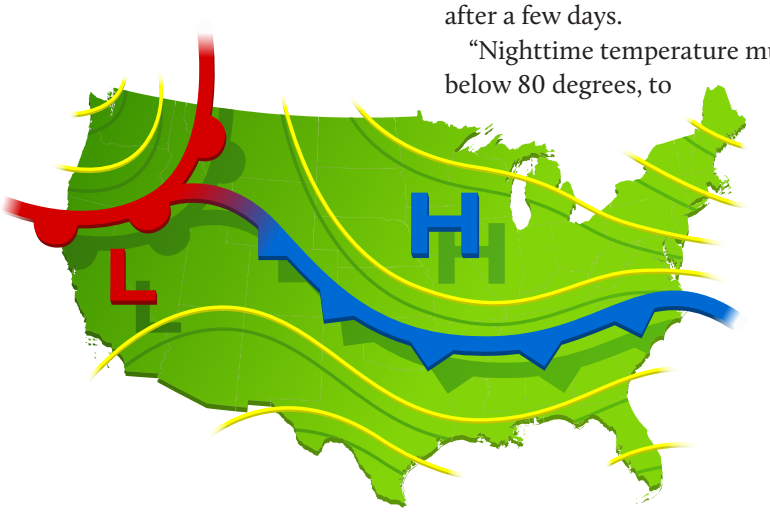
If cattle are out grazing, they need adequate shade and water. "If there are no trees, some producers use portable shade structures," Spiers says. "Cattle need some way to get out of direct sunlight."

The rumen creates heat during fermentation digestion, so cattle must dissipate body heat or it continues to build up.

"Humans have a lighter build and also sweat more than cattle do," he explains. "Cattle also have more hair, which tends to insulate and hold in the heat."

If ambient temperature drops at night, this gives cattle a chance to dissipate excess body heat. But if it stays hot, especially if it's hot and humid, they have no chance to cool off. Heat continues to build in their bodies, resulting in serious heat stress or even death from heat stroke after a few days.

"Nighttime temperature must drop below 80 degrees, to allow cattle to cool off," Spiers says. "Their skin temperature is in the low 80s so if air temperature isn't a lot lower than that, there's no way for them to dissipate body heat at night. The sky is a heat sink, if you have clear nights. But if it's cloudy the heat sink is blocked and cattle can't get rid of the heat."



In an arid climate it almost always cools off at night, and there aren't as many problems with heat stress.

Spiers published a paper last year showing how important nighttime cooling is. "If night temperatures stay high, you'll need to find ways to cool cattle," he says. "If you try to cool them, night is the best time; you have a better chance to get their body temperature lower. It's like opening your windows at night. If you can drop their body temperature a little at night, they can tolerate more heat during the day."

Feedlot cattle may benefit from sprinklers and a person might rig up a sprinkler in the pasture, where cattle could get under a misting of water to help cool them.

A few years ago, one of his graduate students did an experiment with Angus cattle, knocking down the hair coat, and found it reduced their body temperature a little in the summer. This shows that individuals or breeds with long hair have more

trouble dissipating body heat.

"In a feedlot, take heat of digestion into consideration," Spiers says. "Metabolic rate will increase over the next several hours as cattle digest the feed, so don't feed late morning or mid-day because that means heat production will be highest during the hottest part of the day. It's better to feed very early in the morning or late in the day so their heat production will occur during the cooler hours. If you are working cattle, don't do it mid-day. Try to work the cattle very early in the morning."

Spiers says that for years he would take questions from people asking if there was a method or treatment they could give cattle to help them tolerate heat better.

"We've looked at different things over the years, including seaweed, feeding it to Angus cattle in controlled studies to see if it would help reduce body temperature," he says. "We found it did reduce temperature slightly — a couple tenths of a degree, for maybe a day — and then their temperature rebounded and the seaweed no longer had an effect. We never found a 'silver bullet' that worked."

Heat and reproduction

If cattle get too hot, conception rates drop, and cows may suffer from early pregnancy loss.

"If a cow's body temperature gets too high, this may kill the embryo," Spiers says. However, it is difficult to determine the correlation between heat stress and reproduction because it's not always known if heat compromised the pregnancy until later.

Some producers are calving later in the spring and into early summer rather than during the cold weather of February and March, but this means breeding during heat of summer, which can also be a problem. Utilizing artificial insemination (AI) means cows are handled during the heat, which is an additional stress, and conception rates may go down. This may also be a factor with epigenetics.

"What the cow is experiencing during pregnancy can affect the embryo or fetus, or even affect her eggs," Spiers says. "The female is born with all the eggs for her lifetime. If she suffers heat stress that reduces blood flow to those eggs [because she's routing more blood to the skin to try to dissipate body heat], the eggs that are developing could be malnourished and not the prime eggs you'd want. Our knowledge of epigenetics is increasing, and this raises more questions."

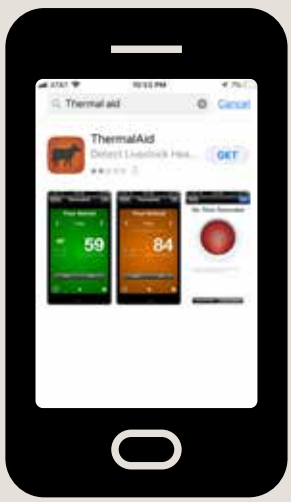
High temperatures coupled with humidity are a reality for many Angus breeders who are at the whims of Mother Nature. Spiers suggests that during summer months breeders work to manage the factors under their control including shade, water and stress. AJ

Editor's note: Heather Smith Thomas is a freelance writer and cattlewoman from Salmon, Idaho.

There's an app for that

Angus breeders and cattlemen have a free app available to them to help monitor heat stress. Don Spiers, professor emeritus at the University of Missouri (MU), says the university has created Thermal Aid™ with cattlemen in mind.

"Anyone can download [Thermal Aid] to their iPhone, program it for beef or dairy application and put in their zip code," Spiers says. "It accesses weather stations in or close to your area, and gives ambient temperature, humidity and predictions of what those will be. Combined, temperature and humidity provide the temperature-humidity index and an indication of how stressful it will be for your animals."



The app gives predictions for several days, and changes color depending on how hot it will be. It goes from green (no stress) to yellow (warning) to red (danger zone).

"If you are working with Angus cattle and you know tomorrow will be in the red zone, you don't want to be moving them, processing or shipping them," he says. "Producers can tap into our university website for suggestions about working with cattle in ways to avoid heat stress."

For more information visit *www.thermalnet.missouri.edu/index.html*.