



PANTING IS ONE SIGN OF HEAT STRESS. Combining soakers with shade is one promising solution to help cows cope better with hot weather.

that number will be eating when soakers but no shade are provided at the bunk during the hottest part of the day.

Compare cooling options

Looking for these telltale signs of heat stress can help producers make informed decisions. Dairy producers clearly recognize the importance of managing the environment to reduce heat stress. A USDA survey found that 94 percent of U.S. dairies use either shade, fans or soakers.

Among these cooling options, what is your best investment? If you already have soakers, have you ever found yourself wondering why some cows don't use them, even on hot days? As scientists, we are trying to understand cows' needs in order to answer such questions.

One answer may be that the best solution is to combine both shade and soakers over the feed line. This is already done in many freestall barns and can be done in drylots as well.

Even though we know that soakers cool cows more efficiently than shade, when cows have to choose between soakers or shade in hot weather, they choose shade. When high-producing cows have both soakers and shade, we have found that they spent a great deal of time (about 8 hours a day) at the feedbunk and start using the soakers at 10 a.m.

By using the soakers in the morning, these cows were able to keep their body temperature within a normal range. By watching cow behavior, we have learned it may be a good idea to turn on soakers in the morning, even before it gets hot.

We have also tried letting cows choose which feedbunk to use — one with just shade or one with soakers and shade. They clearly preferred the feedbunk with both soakers and shade. And in this situation, their breathing rates were only 50 breaths per minute, even though daily high temperatures ranged from 83°F to 108°F.

Shade and soakers best

Recently, we visited some drylot dairies in the California Central Valley to study how housing and management decisions affect heat stress. We found that cows on some farms showed very few signs of heat stress, even on hot days. We visited one dairy on a 100°F afternoon, and cows in the high-producing pen were breathing at a rate of 65 breaths per minute. Only one in 20 cows in the pen showed open-mouth panting.

Compare that with another farm where cows were taking more than 90 breaths per minute. Nearly half of the pen was panting with their mouths open — even though temperatures were only in the high 80s.

What did these farms do differently? Both farms had high-producing cows (86 and 87 pounds per day), shade structures in the pen and used soakers over the feed line. But, the farm with less pronounced heat stress also had shade over the feed line.

The comparison between two farms isn't always quite so simple because other factors, like the amount of water sprayed, also affect heat stress. This example illustrates, however, how studying dairy cattle behavior can provide valuable insight into alleviating heat stress. We will continue to watch for signs that can teach us how to better care for our cows during bouts of hot weather. 🐄

Are your cows hot?

Certain behaviors can identify heat stress before the bulk tank takes a hit.

by Jennifer M. Chen, Grazyne Tresoldi, D.V.M., and Cassandra B. Tucker

HEAT stress costs U.S. dairy producers money — as much as \$1 billion annually. These costs come in many forms. When cows are hot, they eat less, milk production drops and pregnancy rates fall. In extreme cases, cows can even die in hot weather. High-producing cows are especially vulnerable to heat stress.

Watch for signs of stress

As you may have noticed firsthand, the effects of hot days can be seen in terms of less milk in the bulk tank and lower pregnancy rates. These changes come after the fact and tell us that a problem has already occurred.

To get ahead of the game, we need to watch for signals that tell us heat stress is happening now. Some simple observations can tell us a lot about how well we are managing heat stress. Walking past the high-producing pens in the late spring or summer, during the hottest part of the day, and looking for the following can provide useful information.

Are breathing rates elevated? One of the main ways cows cool off is by breathing faster. For 30 seconds, count the number of breaths a cow takes. A full flank movement, in and out, counts as one breath. Then, double that number to get breaths per minute.

When the weather is mild, cows normally take

fewer than 40 breaths per minute. But, if a cow is taking 80 breaths per minute or more, it is a sign that she could be too hot. To get a good sense of what's going on, take these measurements on 10 to 20 or more animals per pen.

How many cows are panting? When breathing faster doesn't provide enough cooling, cows start to pant. Look for cows that are breathing with their mouth open, perhaps with the tongue hanging out and drooling. If your herd is coping well with the heat, you should not see very many cows panting, ideally fewer than one out of 20.

Are cows standing around the water trough? During hot weather, cows need to drink more water because of what they lose through panting and sweating. If you observe a group of cows clumped around the water trough, whether or not they are drinking, this may be a sign that they are hot.

How many cows are eating? When cows are hot, they spend less time eating. Their willingness to feed during the hottest time of day may depend on whether or not there is shade or soakers (sprinklers) over the feed line.

If feed has recently been delivered or pushed up, cows should come and eat. If they remain under the shade instead, as we've seen some cows do in drylots we've studied, this can tell us that they are too hot to eat. We have found when drylots have both water cooling and shade over the feedbunk, about one in five cows in the pen will be eating. Only about half

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