



Study of cow soakers looks at how to cut down on water

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By Dennis Pollock

Soaking cows can cut down on heat stress, but it also can be a bit of a drain on the wallet at times when water is a scarce and costly commodity.

A speaker at a Tulare symposium on managing cow comfort in hot weather talked of how to avoid using excess water while at the same time responding to signs from the animals that they are distressed.

Jennifer Chen, a doctoral student with the Department of Animal Science at the University of California, Davis, cited a study in which she found that 0.35 gallon per minute was the optimum application of water to keep cows cool without wasting water.

She said that is an important consideration when the Tulare County Farm Bureau reported water prices in that county at \$1,200 to \$1,800 per acre-foot in 2014.

Chen said potable water used in dairies can amount to 45 gallons to 194 gallons per day per cow for cleaning cows, the parlor and equipment; from 12 to 73 gallons for spray cooling; and 15 to 29 gallons for drinking.

She left no doubt that cows do benefit from soaking, which helps them release body heat. Chen added that some water can be saved by having soakers on timers, eliminating water use when cows don't benefit.

Use of shade is also important, she said, adding that cows seek soakers and other cooling means earlier than some may realize, as early as 9 a.m. under temperatures as low as 73 degrees.

Chen said cows should be wet, but not dripping water. She said it may be wise to compare different types of soaker nozzles.

Cattle release excess heat by breathing faster, Chen said, adding that it is important to gauge whether an animal is reaching a high stress level by looking for signs of heavy breathing, panting, whether its mouth is open, if its tongue is hanging out or if it is drooling.

Cattle are also likely to eat less when stressed.

Chen uses a free smartphone application to come up with the animal's breathing rate, counting movements of flanks as it breathes in and out — "one and two and three" and so on until reaching 10. The app, available from <http://thermalnet.missouri.edu/ThermalAid/>, calculates the number of breaths per minute.

"It has a built-in stopwatch," she explained.

Chen said there can be great variation among animals and the level at which they experience stress. For that reason, she recommends checking the breathing rates of several animals. Movements of nostrils can also be an indicator.

Noelia Silva-del-Río, dairy specialist with the UC Davis Veterinary Medicine Teaching and Research Center in Tulare, looked at fan and soaker use in lactating pens at 16 dairies.

She looked at whether dairy operators cleaned and calibrated thermostats and found that just under a third needed to do so.

Silva-del-Río also studied fan maintenance that included checking guard attachments, cleaning blades and grills, checking alignment and orientation, and oiling and tightening belts. She said it is wise to check soakers and nozzles, and look for leaks in a water line.

Likewise, she said it is good to see how the sun travels over a pen and whether shading is effective.

Silva-del-Río cited a study that indicated cooling cows with fans and sprinklers from 46 days before expected calving raised the subsequent milk yield. Another study showed that maternal heat stress during the dry period altered the postnatal whole body response of calves.

Silva-del-Río also looked at how often water troughs were cleaned, and found that only 7 percent of producers cleaned the trough every day or every other day. She also said it is important to clean mixer wagons.

She studied how often a total mixed ration was fed and found that most producers, about 64 percent, fed TMR twice a day. She said few dairies adjusted their feeding schedules in the summer.

Alex Souza, UC dairy farm advisor for Tulare and Kern counties, said it is particularly important to pay attention to cows with high milk production that are likely to become especially stressed by heat.

He said there can be some variability among animals, particularly by breed.

"The temperatures of Holsteins appear to rise earlier than for Jerseys," Souza said.

Cows with greater milk production have greater dry matter intakes, he said, and they have higher metabolism rates.

Searching on www.scholar.google.com, Souza said he came up with some 35,000 articles that linked high stress to problems with fertility.

"If you're not convinced that heat stress will affect fertility and will reduce profits," he said, "you'd better search at this website."

Participants in the symposium also heard from Paul Inguez, a meteorologist with the National Oceanic and Atmospheric Administration and National Weather Service in Hanford.

Inguez talked of efforts by the National Weather Service to improve heat impact forecasting, "to deliver more information and sooner."

He said forecasters at various sites use variable criteria for issuing heat warnings. One of the goals of improving forecasts is to put warnings "in context" as it relates to regional differences, time of year and what animals and residents may be accustomed to.

A color-coded warning system is expected to evolve.

Souza said an effort is underway to find dairy operators of 10 herds who would share with the National Weather Service data on their experiences with heat stress, to help in developing the model for the warning system.

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