AgriLIFE EXTENSION
Texas A&M System

Texas Dairy Matters

Higher Education Supporting the Industry

CONSERVE WATER WHILE COOLING COWS

Ellen R. Jordan, Ph.D.
Extension Dairy Specialist
Department of Animal Science
Texas AgriLife Extension Service
The Texas A&M University System

Start preparing now for summer heat stress. When the temperature-humidity index exceeds 72, cows experience heat stress. This can happen as early as April in Texas. Evaluate the cooling system you had in place last summer. Did it cool cows enough or did you see signs of heat stress - panting, reduced production, and decreased conception?

One common method of cooling cows is to install sprinkler systems over feed lanes and in the holding areas. Ideally these systems wet the cow's back, without creating runoff down the cow's sides and onto her udder. But, don't dampen resting areas such as free stalls or under shades.

Many times sprinklers are allowed to run continuously. However, for evaporative cooling to work, there must be a time when the water isn't running, and air is moving past the cows. This ventilation can be natural or mechanical. Most dairies have fans to provide enough air movement to dry and cool cows.

Running continuous sprinklers creates excess moisture which leads to hoof problems. And they waste water. Sprinklers should be set to turn on and off in a 15-minute cycle. The water is

on for three minutes and then off for twelve minutes. Cooling will be more effective if cows are soaked to the skin during the on time and then evaporative cooling occurs during the off time.

Whether in a drought or not, it is critical to we conserve as much water as possible. To calculate how much water can be saved on your farm by adding cycling timers, determine how many gallons of water are used per minute. A commonly used design criteria is 0.03 gallons of water per square foot of wetted surface per cycle. If the sprinklers are set up to spray six feet behind the feeding lane, then 0.18 gallons of water will be used per foot of linear bunk space per three minute cycle.

Next, determine the length of your feed lane. Generally, provide two feet of bunk space per cow. Therefore, every 100 cows in the herd requires 200 linear feet of bunk space. For 100 cows, the water requirement would be 36 gallons/cycle (0.03 gal/sq ft X 200 feet long X 6 feet deep).

If a 15 minute on-off cycle is used, the daily water required to cool 100 cows would be: (36 gallons/cycle X 4 cycles/hour X 24 hours/day) = 3456 gallons of water per day.

Compare this to the same system, operating continuously. Each 100 cows would need 17,280 gallons of water per day compared to 3456. If water costs $1 per 1000 gallons, the cost per day for 100 cows would be $3.46 if the sprinkler system was set up to cycle on and off, compared to $17.28 if the system were operated continuously at the same flow rate.

With night time cooling, the system may not need to operate 24 hours a day. If cooling is used 120 days each summer, for an average of 18 hours per day, the cost savings for cycling the sprinkler would be $1244 per 100 cows.

You might think a finer mist could be used to reduce water use if the system operates continuously. However, fine sprays create a fog around cows trapping moisture and heat instead of cooling the cows. Just the opposite of what you want. Soak cows with large droplets, which require greater flow rates, for best cooling.

Evaluate your cooling system now to get the best results this summer. By cycling the sprinklers on and off, reduced water use can be enough to pay for the investment. Furthermore, this conserves water for other uses. Fewer hoof problems should result from cows standing in wet feed lanes. And finally, the excess water will not have to be captured, transported to a lagoon or other nutrient collection system and eventually disposed of in an environmentally-friendly manner.