



## **Summer heat STRESSES your cows!**

**Access to water, airflow and sprinklers can make a world of difference in keeping cows cool.**

Summer can have a big toll for your dairy herd. This can be in the form of reduced feed intake, lower milk production and impaired health and reproduction.

To counter these, farmers should review their heat abatement strategies and analyze their facilities for ways to improve heat stress management.

US studies in 1998 showed that lactating cows under heat stress have lower feed consumption by 6-16%. These can greatly affect milk production and reproductive performance of the cows. Joe Harner and Mike Brouk compiled researches at Kansas University attested that heat stress can be reduced by improving water availability to cows, taking advantage of natural ventilation in barns and focusing on evaporative cooling.

### **Optimizing water availability**

The easiest method of reducing heat stress is by providing water for everyone. Dairy cattle should have at least 1.2 to 1.5 linear inches of space per cow at a water trough. In the Midwest, one waterer is recommended for every 10-20 cows. While in the Southwest, the requirement per linear space is at 3.6 linear inches of space per cow for 10-15 cows per waterer.

For peak dry matter intake, water is very crucial. Locations of the waterer should be considered when stocking pens or building barns. For a four row freestall barn, water access at each cross over is sufficient. In a six row freestall barn this will not be enough. It is therefore important to understand your pen design and ensure stocking rates are managed for optimum water consumption.

Water space should be available immediately after exiting in a milking parlor. If a parlor has 20 milk units per side, then water space should be available for 20 cows. Cows will consume around 10% of their daily water intake.

### **Air and ventilation**

When managing air quality, it is very important to consider air movement and moisture. This is where the roof pitch, height and width of the barn come in. Generally, barns with open sidewalls have better ventilation. One study reported that 4 ½ (18 degrees) pitch with an open ridge produces the lowest respiration rate of cows compared to a roof pitch or covered ridge. An eave height of 14 feet resulted in lower respiration rate than an eave that is closer to the ground.

When constructing a new barn, consider the width of the building. Narrower barns have better ventilation compared to wider barns. Evaporative cooling is the most aggressive form of cooling method. This is accomplished when the cow dissipates heat through water on her skin, thus removing heat and reducing heat stress.

This can be done by using sprinklers and fans. Brouk and Harner recommend placing sprinklers on the feedline and the freestalls in the housing area.

A study conducted at Kansas State University showed the benefits of evaporative cooling. The study analyzed cattle in eight groups. Treatments were four different soaking frequencies administered with and without supplemental airflow. Soaking frequencies were **every 5 minutes, 10 minutes, and 15 minutes**. And the cow's respiration rates were recorded every 5 minutes for two hours.

Results of the study showed that **cows soaked every 5 minutes with supplemental airflow cooled fastest. Their respiration rates after 90 minutes were reduced by 47%**. While the cows that were soaked every 5 minutes but not given supplemental airflow cooled at the same at about the same rate as cows soaked every 10 minutes under airflow. The results also showed that supplemental airflow without soaking had very little effect on cooling the cattle.

### **Plan ahead**

Above data indicates that the combination of soaking and supplemental fan cooling is superior to single treatment. The drop in respiration rates can be avoided with good airflow and water resources to soak your cows. This will be good for producers/farmers during the peak of the summer season.

The study also showed that farmers can adjust the frequency of soaking depending on the temperature. If the heat stress is moderate, farmers can soak their cows every 10 minutes with fan cooling to conserve water. However, in the peak of heat stress, soaking frequency can be intensified every 5 minutes to lower respiration rates.

Brouk and Harner also recommend turning fans at the freestall barn at 65° F At 68°F soaking frequency should be done every 15 minutes. When the temperature reaches 81°F to 90°F, cows should be soak every 10 minutes, if the temperature goes above 90°F, soaking should be done every 5 minutes.

**Evaporative cooling pads** can be another form of cooling. The Kansas State University used evaporative pads in its maternity barns as alternative for hanging fans in the rafters of the barn. Fans blew air over the pad, reducing the air exiting in the pad into the barn. The evaporative pads cooled the temperature between 10°F and 15°F cooling the cows body temperature at 0.5° F.

It is also important to cool the holding pen. The holding pen will be 4°F to 5°F warmer than the outside temperature due to the cow's body heat. A sprinkler can do wonders for the cows, just soak them every 5-7 minutes and provide 1,000 cu feet per minute of airflow per cow.

On the other hand, to limit heat stress, barns can be remodeled to include these cooling techniques. And the easiest and the most economical strategy to combat heat stress is by constructing new facilities.

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