



DAIRYINFO

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What Should You Do When It Gets Hot?

Wherever you live, you have seen the effects of heat stress on dairy cows. They might be exposed for different lengths of time, ranging from one week to five months, but very few will avoid it entirely. Over the years, much has been written about how heat stress affects dairy cows. This article discusses nutrition and management strategies that have been tested, researched, and used successfully. But first, we want to emphasize that cooling cows with water and air movement should be your top priority. None of the recommendations will work to their full potential unless the cows are cooled first.

Causes & effects of heat stress: Lactating cows begin experiencing heat stress when temperatures rise above 22°-23°C. However, the amount of stress largely depends on humidity, shade, and air flow. Furthermore, heat stress for high producing cows can actually begin at much lower temperatures around 16°-19°C. It is advisable to err on the side of caution and begin using fans and sprinklers as soon as cows look hot.

The most obvious indicator of heat stress is increased respiration rates (>60 breaths/minute). However, heat stress causes many other noticeable behavior changes as well, such as bunching, standing half-in and half-out of free stalls, lethargy, and water guarding. Often these behaviors are hard to explain and, more importantly, hard to correct.

To a cow, perception is reality. Sometimes this perception of discomfort during hot weather can result in bunching behavior. If cows perceive direct sunlight entering the barn at a given time of day as "hot," they will often bunch in a darker area to avoid the rays. Although this behavior doesn't make sense to us, the cows themselves may see it as a logical response to their perception that direct sunlight is responsible for their discomfort. In addition to bunching, you may observe more cows that stand half-in and half-out of a free stall. Perhaps at one point the cow was taking advantage of a breeze at that height above the stall. Versus lying down, this behavior increases skin surface area for evaporative cooling, and [also] allows her to pant more effectively, thereby eliminating more heat.

Unfortunately, the negative effects of standing longer are often not seen until after the heat stress is over. Remember, there can be up to an eight-week lag-time between cause and effect in hoof problems, explaining the spike in lameness often observed in early fall.

Water guarding can be another behavioral response to heat stress. A dominant cow can deny access to water for a high percentage of cows housed together, if she perceives that it is a scarce resource.

In terms of nutrition, cows will respond by reducing dry matter intake (DMI), while increasing water consumption by as much as 100%. At the same time, cows begin sorting more and chewing cud less, which reduces production of an important buffer in the rumen and blood system. All of these effects are the perfect scenario for rumen acidosis, and we all know what acidosis does to dairy cows.

Start with nutrition: The main nutritional problem in times of heat stress is meeting a cow's nutritional requirements in a shrinking space. Several options for solving this problem are commonly discussed. Which one works?

- **Add more grain:** Adding more grain to a diet can result in a quick gain in production and intake, but it may have detrimental long-term consequences. Increasing starch levels is ultimately not a good idea because the result is often an unbalanced rumen during times of heat stress.

- **Increase protein concentration:** As the old adage goes, cows eat amounts, not percentages. Cows have protein requirements that are reported as amounts. The strategy of raising the percentage of crude protein (CP) in a diet addresses the fact that dry matter intake (DMI) is declining, so the protein consumption holds steady. While this seems logical, ration protein levels should also be influenced by other nutrient concentrations. A ration that is formulated, fed, and digested as balanced between protein and energy is our first responsibility. The goal should always be to feed a *balanced ration* that best impacts the rumen.

- **Add fat:** This strategy uses the high caloric density of fat to make up for a shortfall in energy, which is attractive because fat does not ferment into lactic acid. Be aware that there are rumen-protected and unprotected fats. Remember, fat is not friendly to fiber digestion in the rumen. Typically, rumen-protected fat is recommended to bring the total ration fats levels to no more than 6%, as a way to help meet energy requirements, while avoiding the negative effects of fiber digestibility.

- **Increase mineral concentration:** During heat stress, cows can become deficient in minerals much like athletes during strenuous exercise. Raising sodium and/or potassium concentrations in a ration is backed by research... and it works!

- **Use feed additives:** One feed additive that is particularly useful for addressing heat stress is yeast culture. While there is a wide range of opinions on how yeast works, there are several common themes across most of the research: (1) yeast culture increases intake; (2) it improves fiber digestion; (3) it prevents acidosis by reducing lactic acid levels in the rumen. These are the effects we need during times of heat stress.

Being proactive when times of heat stress are imminent, can help prevent many problems when it comes to lactating cows or any livestock! Review your plans and minimize the short-term and long-term impacts of heat stress this summer!

(Edited from numerous articles)

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