Heat stress: Bad for dairy cows and the people who care for them

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Heat stress in dairy cows has long been recognized as having significant negative impacts on dairy production parameters, including milk yield and reproduction, and therefore is a substantial financial burden to dairy producers. It's estimated that problems related to heat stress on the farm can cost in excess of $900 a year in the U.S. alone.

Advances in dairy management, such as cooling systems and nutritional adjustments during heat stress, have helped to alleviate some of the production impacts.

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When subjected to heat stress, cows respond by reducing their intake, changes occur in their endocrine status, there's a reduction in rumination and nutrient absorption and increased maintenance requirements, resulting in a decreasing availability of nutrients for production and subsequent losses in bodyweight.

Heat stress is an accumulation of heat as a net result of a combination of heat and humidity superimposed on the amount of metabolic heat produced by the animal's digestive system. This explains why high-producing cows, consuming and digesting large quantities of feed and producing lots of metabolic heat, are the first animals impacted by heat stress.

When cows no longer have a means to dissipate this heat through cooling, either through management practices or by nighttime cooling, they become heat stressed and will respond with reduced feed intakes. Cooling systems to comfort cows during heat stress can consist of a combination of shades, fans, misters, soakers or even complete indoor facilities with evaporative cooling systems, much like those found in green houses.

Dairy cows are not the only ones on the farm that need help when dealing with heat stress; dairy farm employees need help managing heat stress as well.

The workforce demographics on a dairy farm have changed over the past 20 years. For example, new employees on the farm may have no previous agricultural experience. Many producers who have "grown up" in the industry are aware of the hazards of heat stress.

New employees, however, may not have previous experience working on the farm under hot environmental conditions. Furthermore, an acclimatization period of several weeks is needed for individuals who have not been exposed to high heat conditions.

All employees are at risk of heat stress and heat-related illness during hot periods. Employees at greater risk are those 65 years or older, are overweight, have heart disease or high blood pressure, or take medications that may be affected by extreme heat.

The National Weather Service guidelines for heat safety indicate that individuals performing strenuous activity are in danger of a heat-related illness when the temperature is at or greater than 86ºF and 90 percent relative humidity. Caution should be taken when temperatures and humidity levels are at or above these guidelines.

Additional guidelines are provided by the National Institute for Occupational Safety and Health (NIOSH) to limit the impact of heat stress among employees and prevent heat-related illness. Heat stroke is the most serious heat-related disorder.

Heat stroke occurs when the body becomes unable to control its internal temperature: the body's temperature rises rapidly, the sweating mechanism fails, and the body is unable to cool down. When heat stroke occurs, the body temperature can rise to 106 degrees or higher within 10 to 15 minutes. Heat stroke can cause death or permanent disability if emergency treatment is not given.

Symptoms of heat stroke include hot, dry skin or profuse sweating, hallucinations, chills, throbbing headache, high body temperature, confusion/dizziness and slurred speech. First aid should include the following steps:

- Call 911
- Move the sick employee to a cool shaded area
- Cool the worker by soaking their clothes with water or spraying, sponging or showering them with water
- Fan their body

Heat exhaustion, fainting, heat cramps and heat rash are among the less serious forms of heat-related illness; these conditions must be taken seriously, however, as they could rapidly progress to heat stroke.

Dairy owners should consider working with farm supervisors to manage work conditions where heat stress may occur. Some examples of how to manage heat stress among employees are:

- Schedule maintenance and repair jobs in hot areas for cooler months
- Schedule hot jobs for the cooler part of the day
- Acclimatize employees by exposing them for progressively longer periods to hot work environments
- Reduce the physical demands of employees during hot work conditions
- Use relief employees or assign extra employees to physically demanding jobs

- Provide cool water or liquids to employees
- Allow rest periods with water breaks
- Provide cool areas for use during break periods
- Monitor workers who are at risk of heat stress.

Dairy farm owners should consider providing heat stress training that includes information about worker risk, prevention, symptoms and the importance of monitoring yourself and coworkers for symptoms and treatment.

NIOSH has created the following guidelines for employees: They should avoid exposure to extreme heat, sun exposure and high humidity when possible. When these exposures cannot be avoided, employees should take the following steps to prevent heat stress:

- Wear light-colored, loose-fitting, breathable clothing such as cotton
- Avoid non-breathing synthetic clothing
- Gradually build up to heavy work
- Schedule heavy work during the coolest parts of the day
- Take more breaks in extreme heat and humidity
- Take breaks in the shade or a cool area when possible
- Drink water frequently, enough that you never become thirsty (about 1 cup every 15-20 minutes)
- Avoid alcohol and drinks with large amounts of caffeine or sugar
- Be aware that protective clothing or personal protective equipment may increase the risk of heat stress
- Monitor your physical condition and that of your coworkers.

Dairy producers can reduce the impact of hot weather on both their milk cows and employees by following these basic guidelines. Additional information, as well as free brochures and tip cards on how to prevent heat-related illness are available from the NIOSH website.

Additionally, OSHA offers a free mobile phone app that enables workers and supervisors to calculate the heat index for their worksite, and, based on the heat index, displays a risk level to outdoor workers. Then, with a simple "click," you can receive reminders about the protective measures that should be taken at that risk level to protect workers from heat-related illness. ***PD***

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