

Managing Heat Stress in Dairy Cows

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Summer is approaching fast and it's that time of the year when producers must deal with heat stress in their herds. Heat stress not only decreases milk production, but also affects reproductive performance. Pregnancy rates can decrease as much as 30% during the summer months due to heat stress. Apparently a rise in uterine temperature affects the development of the early embryo. Often these embryos die within the first few days of the pregnancy. Therefore, producers must have management plan in place in order to optimize reproduction during summer months.

Factors That Contribute to Heat Stress

Heat stress occurs when the cow can no longer effectively maintain her body temperature due to excessive heat load. There are a number of factors that determine if a cow is going to experience heat stress. The obvious is environmental temperature. As temperature increases, the cow's body temperature will also increase. The cow will begin to sweat and pant as means to dissipate heat through evaporation. However, even during moderate temperatures (75-80° F), cows can become stressed. This is due to relative humidity. As the amount of moisture in the air increases, it becomes more and more difficult for the cow to dissipate heat through evaporation. Environmental physiologists have developed a temperature humidity index as a guide to measure heat stress in livestock, which combines the effects of both environmental temperature and humidity into one value (Figure 1).

They have classified heat stress into three categories: Mild stress is 72-79° F, Medium stress is 80-89° F, and Severe stress is 90+° F. As can be seen in Figure 1, even in Colorado where relative humidity is low, cows can become stressed when environmental temperatures are greater than 80° F. Other factors that contribute to heat stress include both solar radiation and air movement. Clear sunny days with little air movement can greatly add to heat stress. Clearly, heat stress can be a problem in Colorado. Therefore, producers must be aware of the clinical signs of heat stress and how to minimize it.

Clinical Signs of Heat Stress

1. Increased body temperature > 102.5°F (Normal is 101.5°F)
2. Increased respiration rates > 80 breaths per minute (Normal is 30 breaths per minute)
3. Decreased feed intake
4. Decreased milk production
5. Decreased activity

Producers detecting any of the above clinical signs should consider implementing the following management practices to reduce the effects of heat stress.

Management Strategies to Prevent Heat Stress

1. Provide cool clean water – As temperature increases water consumption will increase by 30 to 40%. Check water supply daily and clean waters on a regular basis to prevent bacterial growth. Avoid pond water as it poses a risk to cattle health during summer months due to increase bacterial growth.
2. Provide adequate shade – If possible, provide portable shade to prevent condensation and manure build-up.
3. Add fat to the ration to maintain adequate dry matter intake – Cows will consume less feed during periods of heat stress. Decreased dry matter intake will result in poor milk yield and reproduction. To maintain dry matter intake during the summer months, increase the proportion fat in the ration. However, fat should not exceed 7% of the total ration on a dry matter basis. Avoid using excessive amounts of vegetable oils.
4. Provide sprinklers and fans – Sprinkling cows with water is an excellent way to increase evaporation. However, it is critical that fans be in place. Sprinkling without fans will only increase humidity and confound the problem.

In Colorado cows will experience periods of mild to medium heat stress throughout the summer, which affects both milk yield and reproductive performance. Producers should implement the above strategies into their management to help reduce heat stress. Cows that are comfortable will be more productive.