



# DAIRY SOLUTIONS

## Minimize the effects of cold stress on your herd this winter

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Since autumn was so mild in the upper Midwest this year, it seems hard to believe, but the truth is unavoidable: Winter is right around the corner. Record snowfall levels and cold temperatures are being predicted for many parts of the U.S. When temperatures drop, dairy cattle are at risk for cold stress. Cold stress is often overlooked by producers, as heat stress is talked about more often and is easier to identify in cattle. However, if you are well-prepared and aware of the signs of cold stress, you can help decrease the negative effects of cold stress on the cattle in your herd.

Cattle are working to maintain a consistent core body temperature at all times. During periods of cold weather, it can become more challenging to maintain that core body temperature, resulting in cold stress. Cold stress occurs when the cow's metabolic processes — along with her thick winter haircoat — do not keep her warm enough to maintain that core body temperature. Cold stress affects not only calves but can also affect cows and heifers as well. However, cows can withstand much lower temperatures than calves. With a heavy, dry winter coat, a cow's lower critical temperature is 18°F. If provided with shelter, fresh water and good nutrition, along with the presence of a clean, dry winter haircoat and an adequate body condition score, dairy cattle can tolerate temperatures well below zero.

Cattle acclimate to the weather that they are exposed to. In order to prepare for winter, cattle will begin growing thicker, longer haircoats to provide insulation against the cold. In order for that winter haircoat to provide adequate insulation during times of frigid temperatures, the cow's coat must be clean and dry, because once the haircoat becomes wet and lies flat, heat begins to escape. It is important to note that cows that are housed in tie stall barns will not have the same thick, long haircoats as cows in free-stall barns or cows with access to the outdoors during winter months.

In addition to relying on their haircoats for insulation, cattle also rely on their body fat stores to provide insulation from the cold. This is especially important for heifers and transition cows. Heifers are growing and require adequate energy to maintain their growth and body condition. Transition cows tend to mobilize fat to support milk production, which can make this group susceptible to cold stress.

Cattle adjust their metabolic rate during cold weather. Before cattle can put energy toward their requirements for growth or lactation, their maintenance energy requirements — or the energy required to maintain their core body temperature and metabolic processes within the body — must first be met. When temperatures drop, these maintenance energy requirements increase. Subsequently, there is a shift in energy demands, meaning less energy will be available for milk production and growth. As a result, changes must be made to the ration to ensure that an adequate amount of energy is available for the cow or heifer. At the same time, some of the effects of cold stress — for instance, decreased water intake, very cold feed or frozen wet feeds — may cause dry matter intake to decrease. Increased energy requirements, coupled with decreased dry matter intake, can negatively affect gut health and production in heifers and cows if intakes and the ration's energy density are not managed.

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Even with thick winter haircoats and adequate body condition, cows or heifers that lack shelter from the wind and that are exposed to wet environments and freezing temperatures can be at risk for cold stress. Cold stress can impact cows in several different ways, and it can also be difficult to recognize. Some factors to look for include altered behavior, huddling, reduced body condition score, low feed and water intake, and decreased milk production or growth performance. Outlined below are some recommended areas of focus during cold weather to ensure that your cattle are set up for success this winter:

- **Shelter:** Provide adequate shelter so that cows and heifers are able to get out of the elements. Curtains should be properly fitted in buildings; however, buildings should not be completely airtight, as some airflow is still required to prevent respiratory illness. In some situations, a wind break may be ideal, but providing a shelter with a roof that allows cattle to stay dry and escape the wind is the best option, as a clean, dry haircoat provides much better insulation than a dirty, wet haircoat. Wind breaks may consist of rows of corn stalk bales or stacked concrete blocks around outdoor lots. Shelter from the wind can have a huge impact, as wind speeds of 5–30 mph can lower the temperature by 6–30°F. This is especially important for heifers or dry cows that are kept separate from the lactating herd and are allowed outdoor access. Deep, clean, dry bedding should also be provided regularly to provide insulation from the frozen ground. Cows bedded with manure solids that have higher moisture levels are more susceptible to cold stress.
- **Nutrition:** Cows' maintenance energy requirements increase during cold weather, shifting energy away from lactation and growth. At the same time, cold stress can decrease dry matter intake as a result of decreased water intake or due to feed being very cold or wet feeds being frozen. This results in the need for more energy-dense rations in order to meet the heifer's or cow's requirements for maintenance, growth and/or lactation. During periods of extreme cold, dietary energy requirement may increase by up to 40%. Since the energy density of the ration is so important during periods of cold stress, it is critical that dry matter intake is dialed in and is as accurate as possible to ensure that cattle are receiving the energy required for maintenance and growth or lactation. During prolonged periods of cold, weaned heifers that are exposed to the elements also require extra grain or calories.
- **Water:** The intake of water is extremely important when it comes to preventing cold stress. Water is an essential nutrient that plays a role in many metabolic processes within the body, and cattle experiencing cold stress typically have decreased water intake. Check regularly to ensure that waterers or water tanks are not frozen. Also check the area surrounding the waterer to ensure that it is free from ice. A buildup of ice around the waterer can deter cows from visiting the waterer because of the risk of slipping. Check to make sure that tank heaters are working properly and that the waterer heating elements are also in proper working order. Any heating elements should be properly grounded and in good working order to minimize the chance of stray voltage. Extremely cold water can deter intake, as cows prefer water to be between 40–65°F.
- **Herd health:** Not all cows are affected by cold stress in the same way, so keep a close eye on the herd for signs of cold stress. Transition cows, older cows and cows that have previously been treated for a health event can be the most susceptible to cold stress. Cows that leave the parlor with wet teats are susceptible to frostbite and sore, chapped teats. Consider using a different teat dip that is designed for cold weather. Growing heifers must also be monitored to ensure that their growth and body condition goals are maintained during the winter months.
- **Facilities:** Minimize slipping by preventing the accumulation of ice on walking surfaces, especially the heavily travelled surfaces to and from the milking parlor, in crossover alleys and in the holding area. Consider adding sand or barn lime for traction in these areas. Slipping can contribute to serious injuries in lactating cows, so it is important to minimize the risk of slipping.

Dairy cattle not only have the potential to experience heat stress but can also be affected by the cold. Fortunately, there are ways to minimize the effects of cold stress on your herd. Work with your [Hubbard Feeds representative](#) to ensure that your heifer, dry and lactating cows have an adequate ration energy density and are maintaining their body condition throughout the winter months.

## References

"Combat cold stress." Progressive Dairy. 31 December 2016. Accessed 4 November 2022.

"Managing dairy cattle in cold weather." University of Minnesota Extension. 15 March 2019. Accessed 4 November 2022.