



## Cold Stress and Cattle

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Although winter officially started on Dec. 21, Manitoba has already experienced an extreme cold snap from December 9-18 and more is predicted for early January. Cold weather is stressful for both cattle and cattle producers but a little common sense and planning will go a long way in reducing hardship this winter.

Winter stress factors may include temperature, wind, rain, snow, mud, feed quality, feed quantity, body condition, adaptation, and perhaps others. Cattle can be amazingly tolerant of cold conditions, but there are certain times when the manager needs to be thinking about what can be done to mitigate stressful cold conditions. This requires some knowledge of the science involved and a certain amount of common sense and experience.

Most beef producers understand that when the weather gets colder their cattle need more energy for maintenance and the requirements of the growing fetus as the cow enters the third trimester.

Temperatures here at the end of the year have dropped well below zero, with wind chills approaching minus 40 degrees at times. It is during these conditions that livestock producers may need to make some adjustments to their management practices to protect their cattle from the elements.

So at what temperature do cattle actually begin experiencing cold stress and then how much more energy do they need?

To answer this, we need to first look at wind chill. Wind chill is a measure of what the combination of wind and temperature feels like. In calm conditions, there is a fine layer of air called the boundary layer that insulates us from the cold. As the wind blows, it blows away this boundary layer and the cold wind can carry away heat from our bodies faster because there is no air insulating us. The faster the wind blows the more heat it can carry away. Think of a cooling breeze on a hot summer day. Depending on where cattle are over-wintered, the location will affect the temperatures that they are experiencing.

Cold raises nutritional needs of beef cattle. To deal with the increased energy demands, we can simply increase the amount of feed delivered to the herd. If cows are being maintained on relatively poor-quality feeds or temperatures get too extreme, altering the amount of feed will not meet the increased requirements for the cattle.

A rule of thumb is to increase total digestible nutrients (TDN) by 1 pound for every 3 degrees drop below -17 C. Another version is to increase TDN 10 percent for every 10 degree drop below the lower critical temperature, which in some cases, with a dry winter coat, may be as high as -15 C for gestating beef cows adapted to winter conditions, but typically ranges from -15 to -20 depending on hair condition.

While many factors influence voluntary forage intake, for planning purposes, cows may consume as little as 2.5% of their body weight as hay under mild conditions but may need to be provided up to 3.5% during severe cold. Cows in good condition can increase their consumption of good quality hay by about 10 lbs maximum and this helps to meet part of the increased energy requirement. After this, the energy must be supplied as grain or as better quality forage. Waste could increase the amount considerably.

Less than adequate feed intake and nutrient content of rations for pregnant beef cows could have short- and long-term consequences. Thin cows may be weak and have a difficult time calving, and they may not produce high-quality colostrum, affecting calf health. Calf vigor and rebreeding may be compromised as well. Fetal programming research suggests that cows fed less than adequate protein during gestation produce calves that may not be as healthy or productive throughout their lives.

Various forages are used as the primary feed source for wintering cows. Better quality forage should be offered during the winter to keep cows in condition. Supplementation often is necessary to meet nutrient requirements of the animals when low-quality forage is fed. Extended periods of severe cold can reduce cow condition, especially if cows are in marginal condition and the ration is not formulated for the severe conditions. Cows can starve to death on a full stomach if forage quality is low and no supplements are offered. Impaction can occur, resulting in loss of rumen function and, potentially, death. If low-quality forage is the primary feed, supplemental protein and energy likely are needed.

There are some management considerations to keep in mind regarding changes in feed intake in response to cold stress:

- Take steps to ensure cattle are out of the wind. If natural windbreaks are available, take advantage of them for choosing wintering sites. If no natural windbreaks exist, take steps to make permanent or portable windbreaks to protect cattle from the wind.
- Make sure that feed availability isn't limited either by snow cover or access to hay feeders, the cattle may not have the opportunity to eat as much as their appetite would dictate.
- Make sure that water is available. If water availability is restricted, feed intake will be reduced.
- Be careful providing larger amounts of high concentrate feeds. Rapid diet changes could cause significant digestive upsets.
- Feeding cattle at night can go a long way toward helping them deal with frigid temperatures. This is because the heat from their digestion peaks a few hours after a meal, so night-time feeding can help cattle reach that heat during the colder moments of the night and into the morning.
- Bedding may not always be necessary for wintering cow herds, but in cases where cattle are wet, bedding is a must. The purpose of bedding is to help keep cattle dry.
- Have your feed tested to determine if your cattle are receiving adequate energy and protein.

It's important to remember that cattle can adapt to short term weather changes relatively well without a significant impact on performance and without suffering long-term effects. However, ignoring the energy costs of long-term cold stress greatly increases the risk of poor performance later.