

Minimizing Winter Cold Stress in Beef Cattle

How cattle respond to the cold

As the temperature drops it is important to think about how livestock are coping in the cold and the affect it is having on their ability to maintain productivity.

Cattle are more tolerant and have more adaptive strategies to handle the extreme cold than the extreme heat. Ability to adapt to the cold is dependent on coat and body condition, acclimatization, and duration of extreme cold. Regulation of internal temperature in the extreme cold comes at the cost of requiring high quality feed and additional feed, such as grains.

Extreme cold = higher energy demand to maintain metabolic functions = higher feed requirements

Performance records indicate that Canadian cattle daily gain is lower during the winter months. During periods of extreme cold cattle will use feed energy and fat deposits to maintain body temperature and vital functions. This quickly becomes a worsening condition, as when body condition deteriorates fat deposits will be used for energy leaving less fat for providing insulation, creating a risk of death from progressive starvation. Precipitation, such as hail, snow or rain, is likely to affect availability and quality of forage and reduce grazing behaviour as shelter is

sought out. Wet animals are at an increased risk to cold temperatures.

When to be concerned?

• Animals at risk:

- Calves < 2 weeks – are born wet and prior to 2 weeks old lack enough hair for thermal insulation
- Pregnant cows - especially heifers
- Lactating cows
- Dirty or wet animals
- Injured or sick animals
- Animals with low body conditions scores (lacking fat deposits) and poor coat coverage
- Stressed animals

• Early fall and winter

- Animals are not yet acclimated to the temperature
- Vigilance for cold stress should start around 0°C

Signs of Cold Stress:

Shivering, cold mouth, frost bite (teats, ears or testis), weight loss, reduced body temperature, inability to get up, calves lacking suckling reflex, decreased respiration, decreased heart rate

The lower critical temperature for cattle, at which they are seeking shelter and remaining there is -23°C.

Normal internal rectal temperature: 38°C
Rectal temperature to be concerned: < 35°C

What can be done to help?

PLAN

Determine at what point you will increase quality and quantity of feed for cattle's higher energy demands during the winter months. The table below gives an idea of the increased feed demand of a cow with a dry winter coat.

MONITOR

Keep a close eye on the weather and observe how cattle are responding, especially during dramatic changes in temperature.

Monitor cattle's water source freezing over. Cattle will switch to using snow as a water source, but it needs to be available in the right amount and source (loose, powdery snow they can pick up with their tongue). The transition of water sources usually takes about two days, resulting in dehydration and creating a higher risk if it occurs during an extreme cold period. Consider supplying water during the transition.

Temperature	-1 °C	-12 °C	-23 °C
Extra Energy	0%	20%	40%
Extra Hay (cow/day)	0 kg	1.6-1.8 kg	3.2-3.6 kg
Extra Grain (cow/day)	0 kg	0.9-1.0 kg	1.8-2.3 kg

ALTER

• Environment

- Bedding – good quality bedding reduces heat loss through conduction to cold ground and create areas that are not wet or muddy
- Reduce the effects of wind-chill - provide shelter, thick tree lines, topographic barriers, snow fences
 - creating a microclimate allows cattle to remain grazing longer
- Sun exposure - house in pastures with good southern sun exposure, cattle will orientate themselves to take full advantage of solar heat

• Activities

- Avoid processing, handling or stressing animals during extreme cold to help them conserve energy and reduce stress

INTERVENE

If a cow's rectal temperature drops below 28°C intervention is needed for a return to normal temperature. Warm the animal and administer warm fluids.

Take special precautions if calving occurs during extreme cold.

- Provide shelter and bedding
- Intervene earlier if calf is not getting enough colostrum
- Cattle younger than 2 weeks need shelter because of reduced thermal insulation