



# Fight Frostbite

Frigid temperatures can be a serious threat to man and beast.

Story by **Kindra Gordon**

**W**hen winter is at its ugliest, wind chill temperatures of  $-20^{\circ}$ ,  $-30^{\circ}$  and even  $-40^{\circ}$  F are not unheard of. That is when the risk of frostbite becomes a serious concern for people and livestock.

Among people, the toes, fingers, ears, chin, cheeks and nose — body parts that are often left uncovered — are usually most susceptible to frostbite.

For livestock, ears and tails, and even the feet of a young calf can be affected. For bulls and cows the concern becomes the scrotum and udder. Wet newborn calves are most at risk for hypothermia and death because they are not fully capable of maintaining their body temperature during the first several hours of life.

Fortunately, with proper preparation, frostbite and hypothermia can be prevented. Here is what you need to know.

## Warning signs

Frostbite can happen in a matter of minutes in extremely cold conditions below zero. Cold winds increase the likelihood of frostbite, as the air circulates body heat away from the skin more quickly.

For both people and animals, hunger, dehydration and exhaustion can accelerate

the effects of frostbite by lowering the body's defenses.

Numbness, tingling and a total loss of sensation are the critical signs of frostbite, according to [www.safety.com](http://www.safety.com). In severe cases the skin will become dark-bluish and look burnt and charred.

Specifically, [www.safety.com](http://www.safety.com) outlines three stages of frostbite:

- ▶ The first stage is called frostnip, which is characterized by a feeling of pins and needles and the skin turning very white and soft. If frostbite is caught at this stage, it won't cause permanent damage and can be treated by soaking the affected area in warm water or breathing warm breath on it.
- ▶ If frostnip is not caught, it will move to the second stage, called superficial frostbite. The skin becomes numb, waxy and frozen to the touch. Blistering may occur, and ice crystals may form in the skin cells of the affected area, which permanently changes the cell structure.
- ▶ The last and most serious stage is called deep frostbite. This can lead to permanent damage, blood clots, gangrene, and even loss of the affected limb. All tissues, including blood vessels, muscles, nerves,

and bone may be frozen, and there is no sense of feeling. At this stage it is critical to seek medical attention as quickly as possible to minimize damage.

Conversely, livestock suffering from frostbite typically don't exhibit pain, and it may be up to two weeks before the injury becomes evident when freeze-damaged tissue starts to slough away, says North Dakota State University Extension veterinarian Charlie Stoltenow. "At that point the only option is to consult a veterinarian and treat the injury as an open wound," he says.

During extreme cold weather, Stoltenow advises producers to take extra time to observe livestock and look for early signs of disease and injury. "Severe cold-weather injuries or death primarily occur in the very young or in animals that are already debilitated," he explains.

For instance, some studies suggest that up to 80% of severe frostbite injuries in cattle are linked to other health-related conditions. Stoltenow says he's had reports of sudden deaths of calves in extreme cold weather, which he believes are often the result of cold weather stress on cattle already suffering from an undetected infection like pneumonia.

## Be watchful for hypothermia

In severe cold weather cases, hypothermia can cause a dramatic drop in body temperature and can lead to death. Uncontrollable shivering is often the most common symptom.

The key to reversing hypothermia is to warm the individual or animal — but it needs to be done slowly to prevent damage to the heart. In case frostbite has also occurred, the body surface should not be rubbed because this too could cause further damage.

To warm calves, the heat source should be about 105°-108° F — warmer temperatures may cause skin burns or shock. Sources of heat include a warm-water bath, an electric blanket, heat lamps or hot-water bottles, plus a warming box.

Supplying an energy source to these calves is also essential, says North Dakota State University's Charlie Stoltenow. If the calf is newborn, supply it with colostrum within the first six to 12 hours of life. Milk or electrolytes with an energy source such as glucose are recommended and can be given through an esophageal feeding tube. Without fluids, the animal becomes acidotic as it warms up and is predisposed to contracting scours or pneumonia.

For a person suffering from hypothermia, remove wet or cold clothing and replace with warm, dry clothing. If the person is dry, use hot-water bottles or heating pads to slowly warm them as opposed to immersing them in hot or warm water.

“Those animals are under stress already, and the weather puts them under such an energy stress that they're putting everything they've got into producing heat,” he explains. In cases of sudden, unexplained livestock deaths, help from a local veterinarian should be sought to identify and address the problem, Stoltenow says.

### Aim to prevent

“Prevention is the key to dealing with hypothermia, frostbite and other cold-weather injuries in livestock,” Stoltenow says. This is because by the time symptoms are noticeable, it's often too late for producers to provide much help.

To get livestock through harsh weather, Stoltenow suggests using shelter and windbreaks to insulate animals from the cold and wind. Plenty of water and high-energy feed should be top priorities.

“Give animals plenty of dry bedding to snuggle into. That insulates vulnerable udders, genitals and legs from the frozen ground and frigid winds,” he adds.

If possible, when wind chills are below 10° F and newborn calves cannot be kept dry because of wet snow, keep calves less than 1 day old in a calving barn.

Also, give special consideration to herd bulls during extreme winter weather. They need wind protection and proper bedding to minimize frost damage to the scrotum and testicles.

Humans can avoid frostbite by dressing properly for frigid weather. A warm hat, gloves, a scarf to shield your face against the wind and insulated waterproof boots are essential. Another tip: Wear several thin layers of clothing as they hold body heat more efficiently than just one bulky layer.

Also, drink plenty of warm fluids to help the body maintain its temperature. If hot drinks are not available, drink plenty of plain water. Avoid caffeine, alcohol and smoking, which hinder the body's heat-producing mechanisms and can actually cause the body's core temperature to drop, according to [www.safety.com](http://www.safety.com).

Most importantly, listen to your body. Shivering and feeling cold or numb are warning signs that your body is losing too much heat and you need to go inside and warm up.

### Worst-case scenario

If you feel the telltale tingling of frostbite coming on, medical professionals advise getting into a warm room as quickly as possible to rest the injured area. Then, remove any wet or restrictive clothing that could hinder circulation. Do not rub the affected area, as this may cause further damage.

Instead, warm the area by soaking it in warm (not hot) water for at least 35-45 minutes, or until the affected area feels warm and sensation returns, advise the professionals at [Safety.com](http://Safety.com). During this warming process, the frostbitten area may be very painful and swell, which is normal.

Using dry heat, such as a heating pad, fire, radiator or heater, to warm the area is not advised because the skin is numb and unable to feel the heat, which could result in a serious burn.

After sensation returns to the frostbitten area, cover it with a cloth or bandage and ensure that the affected part does not become frozen again, which could cause further damage.

Calves suffering from frostbite should also be warmed up quickly to restore circulation and prevent permanent damage. A heat source of about 105°-108° F can be used for this process. Like with people, the frostbitten area should not be rubbed, Stoltenow says, as this can cause further damage.

Once tissues are thawed, the calf should remain in the barn for several days to prevent a reoccurrence of frostbite. Because of damage to circulation from the initial freezing, these tissues will re-freeze very easily.

Though it may be difficult to detect, be watchful for frostbitten teats among cows. The first sign of an injured teat may be a thin calf. An affected teat may cause that quarter to

dry up since the cow won't let the calf nurse. Mastitis is also a possibility, Stoltenow explains.

The effect of frostbite on scrotums and testicles of bulls can also go unnoticed. Inflammation and swelling a few days after the freezing weather are usually the only signs. A scab may or may not appear on the lower portion of the scrotum as healing occurs. Because these lesions can cause transitory or permanent infertility — and because they are so difficult to detect — all herd bulls should have breeding soundness exams 45-60 days after the last severe cold spell, Stoltenow says.

