



Vet Call

► by **Bob Larson**, Kansas State University

Cold weather concerns

A high percentage of the U.S. beef herd resides in areas of the country where moderately to extremely cold winter temperatures are common. By planning for winter weather, ranchers can avoid being caught off guard by extreme events and can manage the typical winter conditions so that cattle do not have to continually utilize body fat as an energy source to keep warm — leading to excessive loss of body condition.

Factors influencing cold tolerance

Situations that are most likely to cause cold stress are cattle with thin fat cover and short hair coats (due to movement from a warmer environment to a colder environment, or extremely cold temperatures early in the fall/winter season), cattle with wet hides, or high wind speed accompanying cold temperatures.

Wind chill is a better predictor of cold stress than temperature alone because cold wind draws heat away more quickly than still air at the same temperature. Wet or mud-caked hair loses its ability to insulate the animal. A wet winter hair coat only provides as much protection from the cold as a typical summer hair coat. If cold wind is combined with a wet hair coat (as can occur during a winter storm), the effects can be profound.

Adult cattle with a dry hair coat; adequate body condition; and abundant, adequate-quality forage can withstand most winter situations, especially if they have the ability to find protection from wind and have been exposed to moderately cold conditions for several weeks. This allows them to acclimate by growing a thick winter hair coat and increasing feed intake.

As temperatures drop, cattle increase heat production, which means the number of calories they need for maintenance increases. This increase is met by consuming more feed and moving it through the digestive tract faster, but the cost of this faster movement is that feed is not digested as fully.

The effect of needing increased calories for maintenance at the same time that feed digestibility is decreasing means that if cows do not have access to plenty of digestible feed, they will have to “burn” body fat as a calorie source.

Another factor that can limit feed intake in winter conditions is if water sources are frozen or unavailable. If feed intake cannot keep up with energy demands, and body fat is mobilized to meet energy demands, then

the cows will have less fat insulation and will be more susceptible to cold temperatures — causing a vicious cycle that can lead to cold stress and even more weight loss.

Bulls and calves

Cold weather brings a special concern with bulls because of potential frostbite damage to the scrotum and testicles. It is very important that bulls have protection from the wind and adequate bedding if they are housed on concrete or dirt.

Cold temperatures have the greatest potential to cause serious problems in young calves, particularly calves in the first day of life. Because calves are born wet, have thin skin and very little body fat, they lose body heat very rapidly. If they are not able to become dry, they can quickly become severely stressed by the cold. Contact with snow or wet ground will increase the amount of time a calf stays wet and in danger. Body temperature of newborn calves can drop to dangerously low levels in three hours or less.

Calves are born with a body temperature of about 100° F. When exposed to a cold environment, calves are able to produce heat in two ways — shivering and the heat production of brown fat (fat that surrounds the kidneys of a newborn). They can conserve heat by reducing blood flow to the body surface and extremities (feet, ears, etc.).

In early stages of cold exposure, a calf will shiver vigorously and have a fast heart rate and breathing rate. If that does not keep the body temperature up, the calf's body sends less blood to feet, ears and nose in an effort to minimize heat loss.

Severe cold stress occurs when the body temperature drops below 94° F. At this temperature, the brain and other organs are affected, and the calf becomes depressed, unable to rise, unwilling to suckle, and will temporarily lose the ability to shiver. The good news is that if the calf can be warmed up and

its body temperature can begin to rise, the shivering response will return and the core body temperature will slowly increase.

Calf management

During periods of cold or wet weather, newborn calves (younger than 1-2 days of age) should be checked every few hours with a thermometer. Any calf with a below-normal temperature, even if it appears healthy, should be warmed. Calves suffering from cold stress must be warmed so that body temperature can rise above 100° F.

If body temperature has not dropped too far, putting the calf in the cab of a pickup out of the wind and rain or snow will warm the calf. In more severe cases, the calves can be placed in warm water, specially designed warming boxes, or near a heat source such as an electric blanket, heat lamp or hot water bottles. To avoid skin burns, the heat source should not exceed 108° F.

In addition to an external heat source, cold-stressed calves should be fed warm colostrum, milk or electrolyte fluid with an energy source using an esophageal feeder.

Prevention of cold stress involves management to ensure that calves can be born in a short period of time and both the calf and dam can stand shortly after calving so they can bond and the calf can begin suckling. Anything that prolongs calving or reduces the chance that a calf will suckle soon after birth should be addressed by management changes. Calving difficulties are minimized by proper heifer development, proper bull selection for calving ease, and proper nutrition so that heifers and cows calve in a body condition score of 5 to 6 on a 9-point scale. Cows with large teats or that are not attentive mothers should be culled.

Forage management

Use of pasture as the primary forage source during calving encourages cows to keep spread apart and minimizes development of muddy areas. If the herd forage plan includes feeding hay, consider feeding hay in early to mid-gestation and saving stockpiled pasture for the calving season. If supplemental hay and grain are fed during calving, these should be provided at locations that are separate and distant from water sources and windbreaks.

CONTINUED ON PAGE 64

▶ VET CALL

CONTINUED FROM PAGE 62

I discourage the use of bale rings in calving and nursery pastures, and suggest that if using large round bales, they be unrolled and the feeding area changed with each feeding. Unrolled bales will have greater hay waste, but reduced chance for mud caused by concentrating the herd into small feeding areas, and unrolled hay provides bedding for newborn calves so they are not in direct contact with the ground.

In addition to monitoring the weather forecast for severe winter weather events

and to be alerted to times when additional feed is needed, minimizing the effects of cold temperatures on newborn calves involves planning ahead and considering calf comfort and protection when making heifer development, bull selection, nutrition and pasture management decisions. Making sure that cows will have adequate access to forage and water even in situations with significant snow cover is necessary to provide sufficient calories to maintain body fat and heat production. Additionally, protecting the

cow herd (and bulls) from winter wind and providing bedding if on concrete or mud/dirt will minimize the effects of severe weather.



EMAIL: rlarson@vet.k-state.edu

Editor's Note: *Bob Larson is professor of production medicine at Kansas State University.*