

Cold Stress and Newborn Calves

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A calf's body temperature often falls below normal due to a slow birth (dystocia) followed by delayed standing and nursing. Returning the calf's core body temperature to normal (100 degrees F for newborn calves) is the immediate concern then maintaining that core temperature is of secondary importance. If at all possible, bring close-up cows indoors to calve in a heavily bedded, clean pen. If calving outdoors, make sure there is dry, clean ground available for the cows to calve on without a large amount of manure. If the cow calves outdoors, bring the calf in until warm and dry if the calf is showing signs of hypothermia and/or there are no natural windbreaks available. The two most important factors in calf survival are warmth and colostrum. Before giving colostrum, a chilled calf first needs to be warmed as these newborns are typically too weak to suckle or colostrum may be delivered by an esophageal feeder. Karo syrup (dark is preferred) delivered by mouth to a calf is a quick source of readily available energy and is rapidly absorbed into the bloodstream. Methods to warm a calf include:

1. Floor board heaters of pickup trucks
2. Submersion of wet calves in a warm bath-you must support the calf to prevent drowning. The water should be gradually warmed to 100° F and will need to be changed to keep it at that temperature.
3. Placing calves next to the heater in the house.
4. Placing the calf under a heat lamp-be careful to cover the lamp with a screen so the calf will not get burned as it becomes more active.
5. Warm blankets-These should not be so hot that they can cause skin burns. Change the blankets as needed to maintain a consistent temperature and not allow the calf to cool off.
6. Hot box or warming box-the temperature should not be so high that burns could result. Some type of venting is necessary to prevent buildup of carbon monoxide and moisture. Air movement is also important to ensure thorough warming of the calf and prevent hot spots in a warming box.
7. Warm IV fluids may be administered by a veterinarian.

Once the calf has been warmed, provide colostrum and maintain body temperature. Colostrum is a concentrated source of protein, vitamins, minerals and energy and also contains antibodies to diseases or vaccines that the dam has been exposed to. If the calf is unwilling to suck and it is not possible to milk the dam, commercial colostrum replacement products are available. Calves should be fed colostrum as soon as possible after the suckle reflex has returned-generally within the first 6 hours after birth but ideally within 1-2 hours after birth. Once the calf is warm and fed, move it back to its mother.

From the University of Nevada/Reno Cooperative Extension Service:

There are two types of hypothermia: exposure (gradual) and immersion (acute). Exposure hypothermia is the steady loss of body heat in a cold environment through respiration, evaporation and lack of adequate hair coat, body flesh or weather protection. This type of hypothermia affects all classes of livestock but particularly affects young, old and thin animals.

Immersion hypothermia is the rapid loss of body heat due to a wet, saturated hair coat in a cold environment. Immersion hypothermia often occurs after the birthing process because the calf is born saturated with uterine fluids. Other causes of immersion hypothermia of young calves may include being born in deep snow or wet ground, falling into a creek or being saturated from heavy rains followed by chilling winds.

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Signs of Hypothermia

Faced with a cold environment, the body tries to defend itself in two ways: shivering, to increase muscle heat production, and blood shunting, to reduce heat loss by diverting blood flow away from the body extremities to the body core. Mild hypothermia occurs as the body's core temperature drops below normal (approximately 100° F. for beef calves). In the early stages, vigorous shivering is usually accompanied by increased pulse and breathing rates. A cold nostril and pale, cold hooves are early signs that blood is being shunted away from the body's extremities. In the case of newborn calves, severe shivering may interfere with its ability to stand and suckle. This increases the chances for severe hypothermia. Erratic behavior, confusion and a clumsy gait, are all signs of mild hypothermia. Producers often refer to these as "dummy" calves. Severe hypothermia results as the body temperature drops below 94° F. Shunting of blood continues, manifesting as cold and pale nostrils and hooves. Paleness is due to poor oxygenation of the tissues near the body surface. Decreased peripheral circulation also results in a buildup of acid metabolites (waste products) in the muscles of extremities. After the shivering stops, it is replaced by muscle rigidity. The pulse and respiration begins to slow as the body core cools to 88° F. Below core temperature of 94° F. , the vital organs are beginning to get cold. As the brain cools, brain cell metabolism slows, resulting in impaired brain function. The level of consciousness deteriorates from confusion to incoherence and eventual unconsciousness. Below 86° F., signs of life are very difficult to detect and the calf may be mistaken for dead. The pupils of the eyes will be dilated and fixed. The pulse may be undetectable. Occasional gasps of respiration at a rate as low as four or five per minute may be the only clue that the calf is still alive. Heart failure may be the actual cause of death.