

Cattle Producer's Handbook

Management Section

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Care of Hypothermic (Cold Stressed) Newborn Beef Calves

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Surveys show that mortality in beef herds from birth to weaning ranges from 3 to 7 percent. The majority of normal deaths occur within the first 24 hours of life. Slow and difficult births (dystocia) and cold stress (hypothermia) are the leading causes of death during this period. Proper care and treatment of the hypothermic or cold stressed calf can prevent this.

Types of Hypothermia

The two types of hypothermia are 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 that results from 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.

Symptoms 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 the result of 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.

Treatment of Hypothermia

The use of a thermometer is essential to determine the degree of hypothermia. Often a calf does not appear to be hypothermic, however, upon taking its temperature, you find that the calf's body temperature is below normal.

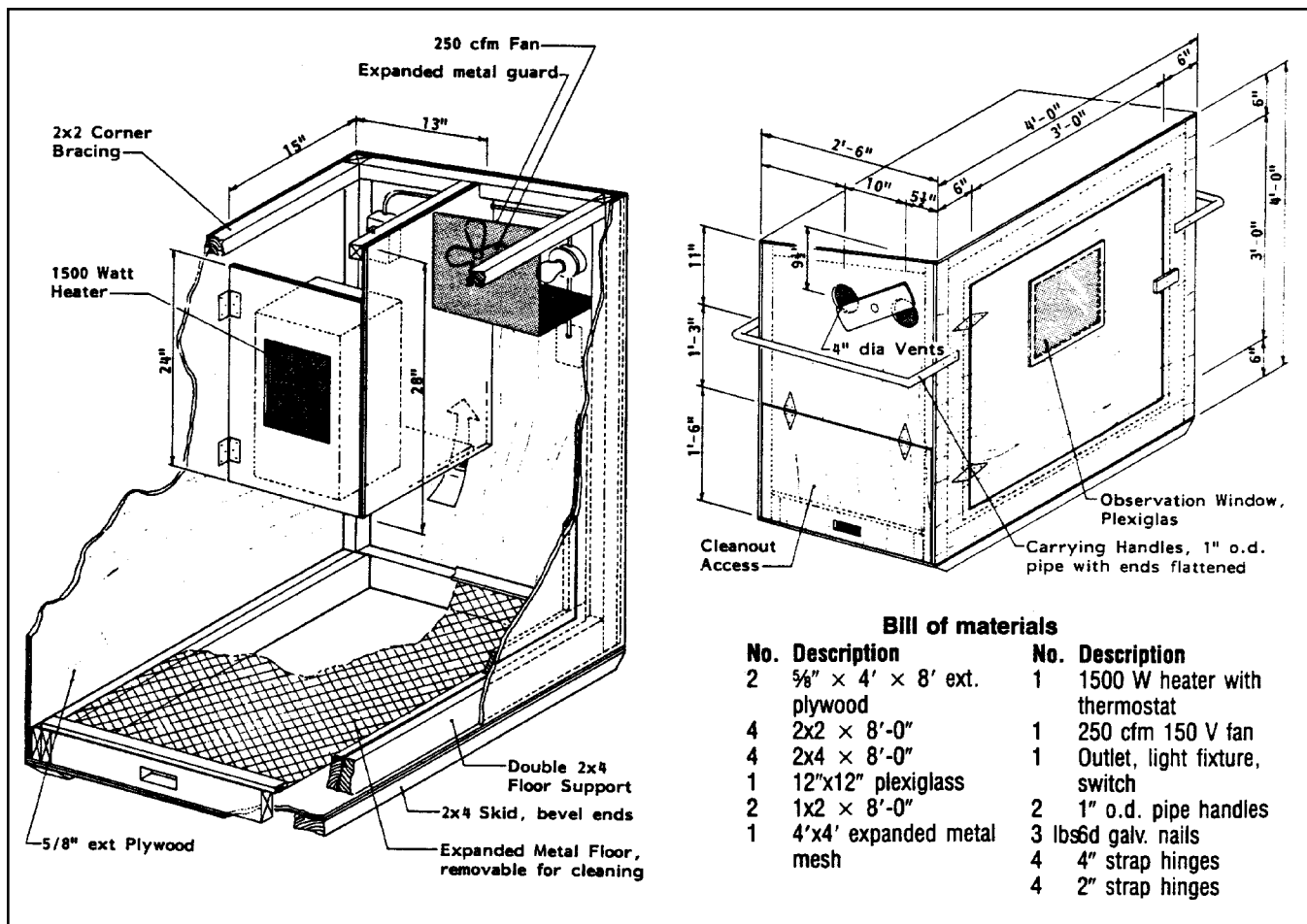


Fig. 1. Plans to build your own warming box on the ranch.

(Source: Beef Housing and Equipment Handbook. 1987. 4th ed. Midwest Plan Service, Iowa State Univ., Ames.

This is often brought on by dystocia (slow births), which may have put the calf in an hypoxic (lack of oxygen) situation. The calf being hypoxic is slow to dry off and nurse, which allows onset of hypothermia.

Returning the calf's core body temperature to normal (100°F for newborn calves) is the immediate concern. Maintaining the normal core body temperature is secondary. Floor board heaters of pickup trucks, submersion of wet calves in a warm bath, placing calves next to the heater in the house, or placing the calf under a heat lamp are all methods that have been used over the years.

Feeding the hypothermic calf warm colostrum as soon as possible speeds recovery and increases the probability of full recovery. Breathing the warm air coupled with consumption of colostrum heats the calf from the inside out and provides the needed energy to overcome the trauma they just went through.

Warming/Drying Boxes

Homemade warming and drying boxes have been used for years with limited success. Most are a 4 foot by 3 foot plywood box in which the hypothermic calf can be placed to dry and warm. Heat sources may include electrical or propane heaters or heat lamps. A fan should

be included in construction to circulate the warm air. Lack of ventilation and thermostatically controlled shut offs are often problems with home models. As the hair coat dries, moisture raises the humidity within the box. This often leads to pneumonia. Also, the calf is often left unattended and suffers from heat stress or scorching.

Several commercially designed calf warming boxes are marketed nationally. Design and construction of these commercial products have overcome the ventilation, overheating, and scorching problems of earlier homemade designs.

The "ROY-L-HEAT" calf warming and drying box¹ uses a 110 volt heater equipped with a circulating fan and automatic shutoff thermostat as the heat source. The circulating warm, dry air moves under the wet calf (the calf sits on a mesh screen elevated 4 inches off the floor) up the sides of the calf and is recirculated through the heater. The accumulated moisture escapes through the attic vent. The heater is protected in a separate enclosure attached to the rear of the box and removes easily to make rinsing and disinfecting simple.

¹ROY-L-HEAT calf warmer is manufactured by Smucker Manufacturing, Inc., 22919 N. Coburg, Harrisburg, OR 97446 (800/333-4503).

The box is made of high density polyethylene. Its interior size provides adequate space for calves to lay down or stand up. Opposite the heater is a rubber "head boot" that permits the calf to breathe outside air when desired, yet holds the warm air in at all times.

The "Calf Saver" warming and drying box² uses a hydro-flame propane furnace with thermostatically controlled spark ignition as the heat source. A 12 volt RV blower circulates the warm, dry air around the wet calf. A strong, lightweight polyurethane, prefabricated shell serves as the warming box itself. The RV battery provides extended life over a regular 12 volt car battery. By using the 12 volt system, producers can take the calf warmer right to the hypothermic calf in the field. The cow stays close by because she can smell the calf in the box as it dries off.

Early treatment of hypothermic calves is important. The severe hypothermic calf can be revived and saved. However, they often are set back from the experience and their body defense system can be compromised. This sets the calf up for pneumonia, scours, and other calfhood problems.

²Calf Saver calf warmer is manufactured by Rotonics Manufacturing, Inc., P.O. Box 94, Jordan Valley, OR 97910 (208) 583-2441.

Editor's Note: Reference to a company or trade name does not imply approval or endorsement by the authors.

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