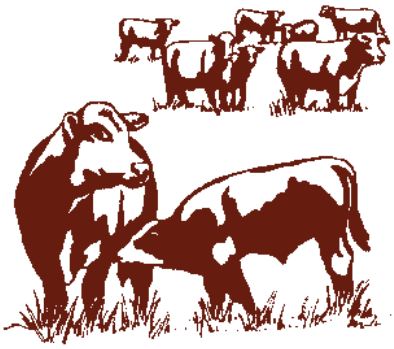
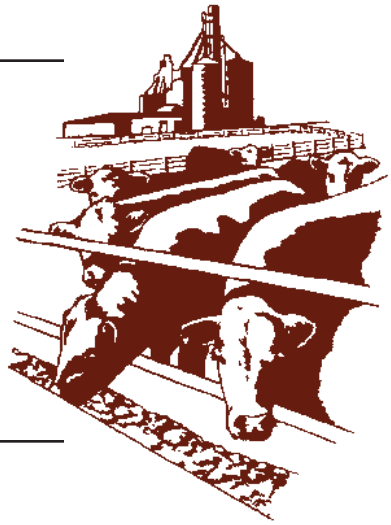


Beef Cattle Handbook



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Prevention of Baby Calf Diseases

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Prevention of disease is, of course, preferred to treatment. One key to prevention, according to some, is to keep things simple or as natural as possible. But in nature or the wild, disease of the newborn often causes rates of loss that would be unprofitable for livestock producers. And while it might be wise to keep things natural or simple, the fact is, the situation has been made unnatural by putting up fences, crowding the animals, fixing the calving season, and giving the cattle no choice as to feed. Is there a way to prevent that occasional loss? Or, if excessive problems occur, how can losses be minimized? Part of the answer is for producers to keep thinking, keep abreast of new developments, and continue to learn from other knowledgeable people.

The following should be read with the realization that there is a lot of new information concerning calf problems and some increase in understanding, but the problems haven't been mastered. Many problems can now be avoided, however, and some can be managed well enough to minimize losses. The term "baby" calf, as used here, refers to the very critical age period—the first week or two of life—after which a well-started calf, on a well-managed, healthy cow, usually flourishes.

As part of a preventative medicine program, a representative number of cattle should be sampled for blood selenium, zinc, and serum copper. Appropriate micronutrient supplementation will prevent or reduce the severity of diarrhea outbreaks.

When in the midst of a disease problem, good investigative efforts, usually by a team, are aimed at determining exactly what factors accounted for the problem. The team might include a practicing veterinarian (and his/her professional contacts in many disciplines), county extension agents, nutritionists, epidemiologists, and producers.

The whole story might be difficult to discover, but often enough, the discovery of important contributory weaknesses in management, health programs, and nutrition, etc., can lead to remedial measures that will stop the disease processes. Early intervention is important so that proper samples can be taken while the cause is still detectable, and remedial measures can be instituted at a time before the situation gets out of hand.

A word of caution is in order. Subpar husbandry of the cattle usually cannot be overcome by anything that comes through a needle, a tube, or a balling gun! The damage can be minimized on an emergency basis in some cases, but a full investigation should point to needed changes that lead to total prevention.

Prevention of Neonatal Calf Diseases

Three factors are extremely important in determining whether a calf remains healthy, survives a disease, or dies. Managers must recognize all these factors:

1. The amount of immunity the calf receives from the dam via colostrum.
2. Kind and amount (dose) of infectious disease agents in the calf's environment.
3. Stress is a factor that facilitates or encourages the establishment of disease.

Immunity

Specific immunity to infectious disease is available to the

calf only through the first milk (colostrum). The colostrum contains antibodies that are absorbed from the intestine into the calf's blood stream and search for and destroy viruses, bacteria, and some parasites. It follows that the cow has to do a good job of manufacturing these antibodies, and to do that, she has to be doing well herself for the many months before calving. If she is not given the proper nutrients to be in excellent health, not only will she not produce good colostrum, but she may produce a calf that is weaker and smaller than desirable.

A newborn healthy calf will usually get up and find the milk supply within a few hours. Keep in mind that if the cow has been lying in some scours from an earlier calf in the pen or pasture, the newborn may ingest massive doses of pathogens (germs) before it finds the colostrum. In some cases, this automatically results in severe diarrheal disease and quick death.

The newborn calf has the capacity to absorb the colostral antibodies into its bloodstream only for the first 12 to 24 hours of life. Difficult birth and stress may dramatically shorten the duration of this ability and thus reduce the amount of protection against life-threatening pathogens. After the first 12 to 24 hours, unabsorbed colostral antibody is digested like any other protein. It is valuable for its food composition, and may even help retard infectious organisms in the intestine. Milk replacers or milk don't have this protective effect.

To receive enough protective antibodies, the beef calf should consume at least 2 to 3 quarts of colostrum in the first 12 hours after birth. Sick cows, cows with blind quarters, and perhaps some first-calf heifers, may not produce that quality and quantity. Also, some heifers may not bond with the calf soon enough. When in doubt, first milking colostrum obtained from dairies, frozen and stored in advance, can be fed to the deficient calf—2 quarts right away and 2 quarts 6 to 8 hours later. In the case of first-calf heifers, prolongation of the time before the calf gets up and tries to suckle may interfere with bonding. Therefore, when supplementing the calf of the first-calf heifer, probably no more than 3 cups should be fed at a time. Dairy cow colostrum tends to be a little less concentrated in terms of antibody, hence the need to feed a little more than the 2 to 3 quarts of beef-cow colostrum mentioned previously when supplementation is the only source of colostrum. It would be wise to check the quality of the dairy colostrum with a "colostrometer" before purchase.

Vaccinations

The protective spectrum of the colostrum can be enhanced by vaccinating the cow against the diseases that may threaten the newborn calf. The antibodies manufactured in response to the vaccine given at the proper time (read directions) appear in the colostrum.

Target disease agents are, for example, Escherichia coli (E. coli), Clostridium perfringens, rota virus, corona virus, infectious bovine rhinotracheitis virus (IBR), bovine virus diarrhea virus (BVD), and others. The effectiveness of some of these vaccines is sometimes questionable, with apparently great results on one farm and poor results on another. Some of the apparent failures of vaccines are due to not following directions or vaccinating cows that are not in good enough condition to mount a good response to the vaccine. Also, the vaccine organisms may differ slightly from the ones carried in the herd, and therefore protection by vaccination may not be optimal in such a case.

Infectious Disease Agents (Pathogens)

Since many of the calf disease agents are carried by the cows, those agents will be in the calf's environment in large doses when it is born, especially if all the cows are crowded in an area that also serves as the maternity area. Whether an agent causes a disease or not depends on how potent its disease-causing ability (pathogenicity) is, the number of organisms the calf is exposed to (dose), and the amount of antibodies carried by the calf (strength of immunity). Infections through the navel (navel ill) occur at birth, especially under conditions of heavy contamination of wet muddy maternity areas. From the navel, the infections commonly spread to joints (joint ill), belly cavity, heart-sac, and brain. Clean calving areas and the practice of soaking the navel with strong tincture of iodine soon after birth seem to be important and logical factors for preventing navel infections.

One management objective is to keep the environmental load of pathogens at the lowest possible level. The area where the calf is born is of particular concern because the time before suckling is when the calf is most susceptible. Therefore, the calving area should not be the area where (possible disease carrying) cows have been congregated before calving. The calving area should be chosen so that calves will not be born in muddy areas contaminated with feces and urine, and individual cows should be placed in this calving area only when calving is imminent.

Since diseased calves shed vast quantities of infectious organisms, and calves may show diarrhea as early as 2 to 3 days of age, a system of segregation should be designed to prevent exposure of young healthy calves to large doses of infectious organisms shed by unidentified carrier cows and sick calves. Ear tagging and dipping of the navel with strong tincture of iodine at birth should be followed by moving the cow-calf pair from the calving area to a cow-calf area. Should any calf in this second area begin to show signs of illness, the pair should be moved to a sick pen/hospital area for thorough evaluation and treatment if indicated. The calving area and the second cow-calf area should be as free as possible of gross contamination with excretions of sick animals.

The location and design of the sick pen area should take into account the weather conditions and treatment ease. Adequate shelter, power for heat lamps, and dry bedding are minimal requirements. Water troughs should be low enough for calves, and loose salt (1/2 sodium chloride and 1/2 potassium chloride) should be accessible by the scouring calf. Low blood potassium is characteristic of some of the most depressed scouring calves.

This type of arrangement has been helpful in preventing or minimizing diarrhea outbreaks, and in providing adequate supportive care for sick calves. With the water and salt available, some calves will actually treat themselves. If a calf is too dehydrated and depressed, the manager will have to supply adequate amounts of the right type of balanced electrolyte/fluid, perhaps by esophageal feeding.

Of all the calf disease agents, Salmonella species, a bacterium, is probably the most fearsome. Fortunately it is not as much a problem in beef herds as it is in dairy calf-raising facilities. When it occurs among beef calves, it can often be traced to a saleyard dairy calf grafted on one of the beef cows. It is advisable to purchase calves for this purpose from dairies where there is good calf-rearing husbandry and little disease. There are no guarantees, however, since wild mice can carry the Salmonella bacteria. The grafted calf and cow should be kept separated from the rest of the cow-calf herd for at least 10 days.

Stress

Stress refers to situations and conditions that appear to make an individual more susceptible to disease than usual. Extremely cold weather, wet cold weather, wind chill, very hot weather, lack of food, breathing of dusty or otherwise polluted air, and pain are commonly cited as stressful contributors to serious disease outbreaks. For newborn calves, lack of adequate energy supply (milk) and cold, damp, windy weather are common sources of stress. Milk is the only source of energy for the newborn calf. The energy derived from it helps create heat as well as to sustain the functions of vital organs and defense mechanisms. To offset extremely cold weather (zero degrees fahrenheit or lower), the cow also has to produce more heat, thus her energy goes more for heat and less for milk. To compound the problem, many people falsely believe that there is such a syndrome as milk scours, and cut down on the cow feed with the intent of decreasing milk production and stopping the scours outbreak in the calves. This strategy seems to work—calves stop passing so much liquid feces. However, by withholding milk you don't stop the disease, just the flow of fluid. Diarrhea is actually nature's way of flushing out unwanted toxins and pathogens. Therefore, withholding milk from calves, particularly those with diarrhea, takes away their only energy source (important for keeping warm) and the major supply of desperately needed liquid for rehydration and flushing.

In light of this, we recommend that nursing cows receive increased amounts of dietary energy during adverse winter weather and that calves have available shelter. A rule of thumb for supplementing cows is, for each 1 degree drop below 10°F, there is at least a 1 percent increase in energy requirement. If the weather is unusually wet and windy, the demand may be 2 percent energy increase per degree drop. However, too often, a cow cannot physically consume enough feed to meet extreme energy needs, especially if the forage is of poor quality. Corn, wheat, or barley supplements may be necessary. These calculations can be made easily by most farm animal veterinarians and county Extension Agents with their ration-formulation computer programs.

Energy conservation is possible through use of windbreaks for cows and calves, and specifically designed, portable shelters for calves only. Sanitation in these shelters is important. Frequent moving and rebedding may be necessary, depending on the concentration of calves in the shelters.

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