



Beef Cattle Handbook



BCH-3050

Product of Extension Beef Cattle Resource Committee
Adapted from the Cattle Producer's Library

Feeding Colostrum to a Calf

Donald E Hansen, Extension Veterinarian, Oregon State University

When a calf is born it is virtually unprotected against infectious diseases until it absorbs an adequate supply of colostrum. Generally, we must rely on good management and a sanitary environment to help protect the calf from immediate infection. Within hours of suckling colostrum from its dam, the calf develops protective antibodies in the blood stream that immediately help to fight off infection. If the calf fails to suckle or for some reason does not receive an adequate amount of colostrum, it must rely on its naive immune system to develop protective antibodies soon enough for protection. If the infectious agent is present in large numbers or is particularly strong (virulent), the calf's immune system is overwhelmed, and the calf succumbs to disease.

Natural Protection

Colostrum is the primary source of immediate natural protection. Ingestion of this antibody (immunoglobulin) rich milk is critical for newborn calf survival. The dam's serum antibodies (IgGs) are concentrated in the udder as colostrum during the last month of pregnancy. The concentration of antibodies is lower in heifers as compared to mature cows. For maximum protection, an adequate amount must be delivered within 4 to 12 hours of birth.

Colostrum in the beef cow tends to be more concentrated than in the dairy cow. Generally speaking, a 75-pound calf ingesting 2 to 3 quarts of its mother's milk in the first 12 hours after birth will receive adequate colostrum. But what can be done for the calf whose dam has no milk or is otherwise deprived of colostrum?

The best substitute for the natural mother's colostrum is colostrum from another cow. This can be

collected and kept frozen in quart containers. However, many modern freezers that have an automatic defrosting system may cause the frozen colostrum to lose a percentage of its protective antibodies when stored over a long period of time (e.g., 12 months).

Some care must be taken when thawing frozen colostrum. Studies have shown that rapid defrosting using boiling temperatures destroys a portion of the colostrum by destroying the protein antibodies. These same studies have shown that defrosting in a microwave at settings above 60 percent power has the same result.

Two methods that can be recommended are: a warm water thaw where the container (1 or 2 quarts) of colostrum is immersed in 110°F water and stirred every 5 minutes to assure even thawing and warming (continue this process until colostrum reaches 104°F); or use of a microwave oven set at no more than 60 percent power. Again, agitate frequently to assure even warming and thawing, and stop when the colostrum reaches 104°F. Either process will take approximately 40 minutes.

We cannot assume that the antibody concentration in the colostrum of all cows or heifers is equal. In fact, studies have shown that the antibody concentration varies considerably from cow to cow, breed to breed, and heifer to heifer. There is no practical way to measure with certainty the antibody concentration of colostrum before delivery. Colostrometer measurements are helpful but may vary also. However, fresh or fresh-frozen and properly thawed colostrum is still the best source of natural protection for a newborn calf.

Colostrum Substitutes

During the past several years, several colostrum substitutes have been promoted for use in calves. These products are not adequate substitutes for cow colostrum. They are meant to be supplements for calves that have already received some natural colostrum. A list follows of some of the colostrum supplements commercially available.

Colostrix (Protein Technology, Inc., Minneapolis, Minnesota) - A powder product derived from ultrafiltration of cheese whey. Each bag of colostrix is stated to contain 24 grams of immunoglobulin. If a calf requires 150 grams, it must consume six or more bags of the product. This product is reconstituted at about 1 quart/bag. In order to receive adequate amounts of antibody mass, a calf would need to be given 6 quarts or more within 12 hours. This volume is not recommended.

Colostrum Bolus II (Smarte International, Inc., Alberta, Canada) - These boluses have been reported to contain 0.3 gram of immunoglobulin in each 6-gram bolus. You may calculate the number of boluses required to deliver even a minimum of 80 grams of immunoglobulin (antibodies) to a newborn calf.

ID-10 (Cuprem, Kenesaw, Nebraska) - This ultrafiltrate powder product is derived from first colostrum whey and is available as a nutritional supplement. The product is recommended by the manufacturer to be given in 10 cc oral doses for 3 days. If the calf shows evidence of scours, 15 to 25 cc doses can be given. At manufacturer recommended dosages, less than 5 grams of total antibody mass would be given to the newborn calf.

Dried Colostrum Whey (Smarte International, Inc., Canada) - A colostrum whey powder given orally. Recommendations are to give 1 to 3 ounces of whey powder per quart of reconstituted milk replacer. Again, as with other products mentioned here, a dosage of 2 ounces/quart would deliver approximately 8 grams of antibody mass.

Nurse-Mate First Milk (Sterling Tech., South Dakota) This paste product contains less than 5 grams of immunoglobulin in a 30 ml tube.

Many other products are on the market that promote colostrum supplementation of the newborn. We have given just a few as examples, with no recommendation intended. Remember these products are supplements, not substitutes.

Reprinted from CATTLE PRODUCER'S LIBRARY CL644

Author:

Donald E Hansen, Extension Veterinarian, Oregon State University

This publication was prepared in cooperation with the Extension Beef Cattle Resource Committee and its member states and produced in an electronic format by the University of Wisconsin-Extension, Cooperative Extension. Issued in furtherance of Cooperative Extension work, ACTS of May 8 and June 30, 1914.

BCH-3050 Feeding Colostrum to a Calf