



Cattle Producer's Handbook

Animal Health Section

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Feeding Colostrum to a Calf

Donald E. Hansen, DVM, Extension Veterinarian
Oregon State University

When a calf is born it has limited immunity against infectious diseases. If it absorbs an adequate supply of colostrum its immunity is enhanced. 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 absorbs protective antibodies into the blood stream and other immune cells into its lymph nodes that 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 protection soon enough to avoid clinical disease.

For most infections it takes the immune system 6 to 10 days to respond adequately. If management and environmental factors depress the calf's resistance and 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

A newborn calf does have some natural protection against infectious disease. For example, its skin, tears, saliva, and digestive juices are natural barriers for some harmful microbes. However, colostrum provides an additional and immediate source of natural protection. Ingestion of this antibody (immunoglobulin) and immune-cell rich milk is critical for newborn calf survival.

The dam's serum antibodies (IgGs) and some important immune stimulating cells are concentrated in the udder as colostrum during the last month of pregnancy. For maximum protection, a calf must receive an adequate amount within 4 to 12 hours of birth.

Researchers believe that the non-antibody immune cells found in colostrum are required for complete maturation of the calf immune system. Research has shown that without their presence calves are more susceptible to disease throughout their lives than calves that received adequate levels of these immune stimulating cells.

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 colostrum in the first 4 to 6 hours of birth will receive adequate colostrum.

Measuring Antibody Concentration

We cannot assume that the IgG 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. However, we can measure antibody concentration after birth by using a Colostrometer™. It is designed to estimate the IgG antibody concentration in colostrum. A few tips on using a Colostrometer™:

- Always collect a clean sample. Make sure no foreign debris falls into the container.
- Be certain the temperature of the colostrum is about 70°F. Very cool or warm temperatures will result in misleading results.
- For best results feed only colostrum that registers solidly in the green zone or >60 mg/ml.
- Fresh or fresh frozen and properly thawed colostrum is the best source of natural protection for a newborn calf.

Handling and Storing Colostrum

Even though a calf may need its own dam's colostrum for the immune stimulating cells that seem to energize its immune system, the next best substitute for the natural dam's colostrum is colostrum from another cow. This should be collected from cows within 12 to 24 hours of their calving and used fresh for optimum results. It is recommended to collect colostrum from a quarter not yet suckled by a calf. Also, colostrum may be frozen for future use. Storing in small (quart size) containers is recommended for easy thawing and individual calf delivery.