



Hand-raising a baby calf requires a commitment to providing adequate nutrition, housing, and care to give the calf the best chance to grow into a healthy, productive adult. This information is designed to help provide a better understanding of generally accepted calf management guidelines and how each recommendation benefits the calf. It is not intended to provide treatment recommendations - there is no substitute for sound information from your veterinarian.

WHY IS COLOSTRUM SO IMPORTANT FOR NEWBORN CALVES?

Feeding high-quality colostrum immediately after the calf is born is the single best way to help ensure the long term health of the calf. **Colostrum** is the first milk produced by the cow after giving birth. Calves are born with almost no ability to fight disease on their own, and must consume their antibodies (also commonly known as **IgG**, **immunoglobulins**, or **globulin protein**) from the cow's colostrum. The process of acquiring immunity from colostrum is called **passive transfer of immunity**. In the first day of life, the newborn calf has the ability to absorb antibodies directly into its bloodstream without digestion. Antibody absorption is most efficient immediately after birth, and steadily declines to virtually zero at 24 hours of age. For this reason, it is extremely important to feed colostrum as quickly as possible after the calf is born, and continue feeding only colostrum for the first day of life. When a calf does not receive enough antibodies from colostrum it is said to have **failure of passive transfer**, or **FPT**. In addition to providing antibodies, colostrum is a rich source of protein, fat, natural growth hormones, minerals, and vitamins for the newborn calf.

PRESERVE THE WHOLESOMENESS OF NATURAL COLOSTRUM WITH SANITARY COLLECTION

Cleanliness during colostrum collection, handling, and storage is of the utmost importance because contaminated colostrum can easily transmit disease to the newborn calf. The newborn calf's digestive system is like a sponge to allow it to absorb maternal antibodies from colostrum, but it is not selective – bacteria and other pathogens can also be absorbed directly into the bloodstream if they are present in colostrum. The cow's udder should be cleaned using the same approach used when milking lactating dairy cows. Here is a suggested procedure to use when collecting colostrum:

- 1) Dip each teat with an antibacterial pre-dip to kill any bacteria present on the teat skin.
- 2) Wait at least 30 seconds, and then wipe the pre-dip off with a clean paper towel.
- 3) Milk a few squirts from each teat and make sure the colostrum looks normal (smooth, creamy, free of blood). Discard this colostrum.
- 4) If using a mechanical milking machine, make sure all equipment is completely clean. If milking the cow by hand, be sure to wear new disposable surgical gloves.
- 5) Make sure that the pail or bucket used to collect the colostrum is clean.
- 6) Your goal should be to collect at least 1 gallon of fresh colostrum, which is generally enough to provide adequate passive transfer of immunity for the calf if the colostrum is high-quality. If you have a dairy cow, milk her out completely and save any extra colostrum for the next feeding or two.

Do not feed colostrum that is contaminated with blood, manure or chunky material, or if it has been allowed to stand without refrigeration for more than 30 minutes after collection - bacteria grow rapidly in fresh colostrum. Also discard colostrum from the cow if she is known to have a transmissible disease.

MEASURE COLOSTRUM QUALITY TO HELP PREVENT FAILURE OF PASSIVE TRANSFER

When you are sure you have clean, fresh colostrum, it is recommended that you measure the quality with a **colostrometer** if possible. Colostrum quality is a measure of its antibody concentration. A colostrometer is a tool used to estimate the amount of antibodies in colostrum by measuring the specific gravity (density or weight per unit of volume) in the liquid. The colostrometer is most accurate if the colostrum sample is at room temperature, so fresh colostrum should be cooled and stored colostrum should be warmed prior to use.

To properly use the colostrometer, use a graduated cylinder (typically included when you purchase the colostrometer) and fill nearly to the top with room-temperature colostrum. Place the colostrometer into the graduated cylinder and read. Most colostrometers have a color-coded scale to indicate colostrum quality; if the colostrometer comes to rest in the green area, the colostrum is good quality, the yellow area indicates marginal quality, and the red area indicates poor quality.



STORE COLOSTRUM PROMPTLY AFTER COLLECTION TO SLOW BACTERIAL GROWTH

Contaminated or poor quality colostrum should be discarded, but good and marginal quality colostrum can be stored for future use. Once colostrum is collected, it should be placed into clean 1 to 2 quart containers that can be refrigerated or frozen. Label each container clearly with cow's name or number, the date of collection, and the quality measured by the colostrometer, if you have it. Refrigerated colostrum should be used in less than one week, whereas frozen colostrum can be stored for 6 months to one year. Avoid using a frost-free freezer for frozen colostrum if possible. If all you have is a frost-free freezer, use the frozen colostrum within 2 to 3 months. Outdated stored colostrum (refrigerated or frozen) should be discarded.

REWARM COLOSTRUM GENTLY TO PRESERVE THE FRAGILE ANTIBODIES

Storing colostrum in small volumes allows for easy thawing and re-warming for feeding. Stored colostrum should be thawed and warmed as you would a baby bottle, over a warm water bath. Using a microwave to thaw colostrum is not recommended because the antibodies can easily become damaged, reducing colostrum quality.

FEED COLOSTRUM AS SOON AS POSSIBLE AFTER BIRTH TO MAXIMIZE ANTIBODY ABSORPTION

The goal for colostrum feeding should be to feed 3 to 4 quarts for large breed dairy calves and 1-1/2 to 2-1/2 quarts for beef or small breed dairy calves, of high-quality colostrum within 2 hours after birth. Colostrum should be warm (about 100-105°F) and fed with a nipple bottle. Continue to feed only colostrum every 8-12 hours for the first day of life. If you purchase a young calf and are unsure exactly how old the calf is, the calf should still receive colostrum. Even though antibody absorption may be decreased, the calf will benefit from nutrients and antibodies in colostrum. Colostrum contains much more than just antibodies. Colostrum provides other essential proteins, fats, sugars, vitamins and minerals, as well as special growth factors and hormones that help the digestive system to develop and mature.

PASTEURIZATION OF COLOSTRUM IS A PRECISE PROCESS NOT RECOMMENDED FOR MOST PRODUCERS

Colostrum has been pasteurized successfully in a research setting, but it requires great care because it is very easy to overheat the colostrum, damaging the proteins and reducing colostrum quality. Severely overheated colostrum coagulates and becomes extremely thick, making it unusable. Failure to reach a high enough temperature or maintain it long enough to kill pathogens may give you a false sense of security. Even successful pasteurization damages at least some of the antibodies, so it is not recommended for most producers. The contamination that is typically treated well with pasteurization can be minimized with proper collection and storage.

ADDITIONAL RESOURCES

Your livestock veterinarian and local university extension agent are also excellent resources for calf management information, as well as many online sources. Please visit the Learning and Resource Center at www.savacaf.com for some helpful online links.