



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

## WHY IS COLOSTRUM SO IMPORTANT FOR NEWBORN ANIMALS?

Feeding high-quality colostrum immediately after an animal is born is the single best way to help ensure the long term health of the newborn. **Colostrum** is the first milk produced by the mother after giving birth. Most animals are born with virtually no ability to fight disease on their own, and must consume their antibodies (also commonly known as **IgG**, **immunoglobulins**, or **globulin protein**) from the mother's colostrum. In the first day of life, the newborn 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 animal is born, and continue feeding only colostrum for the first day of life. In addition to providing antibodies, colostrum is a rich source of protein, fat, natural growth hormones, minerals, and vitamins for the newborn.

## PASSIVE TRANSFER OF IMMUNITY TO THE NEWBORN

The development of immunity in the newborn by consuming antibodies from the mother's colostrum is called **passive transfer of immunity**. This process is critical to provide temporary protection to the newborn until its own immune system begins producing antibodies in response to disease or vaccine exposure. **When an animal does not receive enough antibodies from colostrum it is said to have failure of passive transfer, or FPT.** During late **gestation** (pregnancy), blood flow to the mother's mammary (udder) tissue increases, and large quantities of protective antibodies (immunoglobulins) are transferred to the mother's colostrum. Colostrum also contains elevated levels of fat, vitamins and minerals, and lower levels of **lactose** (milk sugar). The higher antibody and nutrient content of colostrum rapidly declines after the first milking to near normal levels by the third milking. The animal's ability to absorb the antibodies also declines rapidly in the first 24 hours of life, for the following reasons:

- Digestive capacity in the stomach (or abomasum, for ruminant animals) is limited immediately after birth to allow absorption of the antibodies into the animal's bloodstream intact, but begins developing as early as 6 hours of age.
- In the first 24 hours, the absorptive cells (**mucosa**) lining the intestine are spaced farther apart to allow the large antibody proteins pass through to the calf's bloodstream without breaking them down. The first feeding (whether colostrum or not) begins to trigger **gut closure**, a tightening of the spaces between mucosal cells to normal levels.
- Colostrum contains a substance called **trypsin inhibitor** which delays the enzymatic breakdown of antibodies in the intestine, helping to protect them from digestion.

Unfortunately, the **permeability** (sponge-like characteristic) of the intestinal mucosa of the newborn is not selective, so bacteria and other pathogens can be absorbed into the calf's bloodstream along with the antibodies, potentially causing **septicemia** (blood infection). For this reason, it is extremely important to maintain strict sanitation when collecting and feeding colostrum, and chill fresh colostrum promptly to minimize the potential for contamination and bacterial growth.

## COLOSTRUM QUALITY

When considering colostrum quality, a number of factors must be evaluated. High quality colostrum must be fresh, clean, disease-free, and have adequate amounts of antibodies to support effective passive transfer of immunity. The antibody content of colostrum depends upon a number of factors:

- The diseases the mother was exposed to (through infection or vaccination) prior to birth of her newborn – she can only provide antibodies she herself has in her bloodstream. Older mothers typically have greater and more varied disease exposure, leading to much higher quality colostrum than first time mothers.
- Adequate nutrition for the mother during gestation affects development of the young and colostrum production.
- Mothers that were lactating (milking) while pregnant must be given adequate time to "dry off" to enable antibodies to concentrate in the udder. Dairy animals milked right through to birth are unable to form high quality colostrum.



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**ADDITIONAL RESOURCES**

Your livestock veterinarian and local university extension agent are excellent resources for animal management information, as well as many online sources. Please visit the Learning and Resource Center at [www.savacaf.com](http://www.savacaf.com) for some helpful online links.

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