

Colostrum 101

Plan ahead to ensure success.

by *Lindsay Waechter-Mead, DVM*



Most cattle producers understand the importance of making sure calves receive an adequate amount of colostrum. However, the number of Failure of Passive Transfer (FPT) calves in North America ranges widely from 11-31%. We have several key colostrum management factors to ensure calves are set up for success from the beginning of life.

Why is colostrum important?

The bovine placenta is unique because it stops maternal and fetal blood supplies from mixing. This separation prevents immunoglobulins from being transferred to the fetus prior to birth. Immunoglobulins are a class of proteins that act as antibodies to protect the immune system from disease. Without the transfer

of protective antibodies from the dam to the calf, the calf is at risk for illness or even death. FPT calves have an increased risk of preweaning mortality as well as neonatal and preweaning morbidity. Failure of passive transfer also has a negative effect on weaning weights and average daily gain in the feedyard due to increased incidence of morbidity early in life.

What exactly is colostrum?

Colostrum is the first milk produced by the dam. It contains immunoglobulins, specifically IgG, which is derived from the dam's blood serum. This process begins as early as five weeks before calving and peaks around 1-3 days before birth. In addition to IgG, colostrum also contains white blood cells, such as neutrophils and leukocytes, that help further protect the calf from pathogens

and provide the necessary energy and protein required for nutrition.

How much does a newborn calf need?

Historically, it was thought that calves required at least 100 grams of IgG for immune protection. More recent studies indicate that 150-200 grams is ideal. Several factors can influence the quality of colostrum, including the dam's nutrition, body condition score (BCS), age and breed. Cows usually have higher quality and quantity of colostrum than heifers do. Researchers have shown calves born to heifers with a BCS of 5-6 stood faster and had higher levels of IgG than calves born to heifers with a BCS of 3-4. A good rule of thumb for colostrum ingestion is 5-6% of calf body weight (in quarts). For example, an 80-pound calf \times 5% = 4 quarts of colostrum. This can be broken into two feedings within the first six hours of life.

Timing is everything

The cells lining the small intestine are primed to readily absorb IgG at birth, but the timing window decreases significantly after 12 hours of life. Peak absorption happens in the first four hours post-calving and complete gut closure is observed at 24 hours of life. Temperature can affect gut absorption, as well as metabolic acidosis, which occurs in calves that experienced difficult births. If you assisted in the birth of the calf, it is a good idea to ensure colostrum intake by milking the cow and offering it to the calf. Studies have shown minimal difference in IgG absorption when comparing nipple feeding versus feeding via esophageal tube, therefore either method is correct.

Tubing is usually required in calves born under distress because they lack the vigor to nurse. Colostral immunoglobulins have shown to provide some protection for up to 5 months of age. Local protection at the intestinal level may be obtained even after gut closure. For example, supplementing milk with colostrum during rotavirus diarrhea cases may provide a positive mucosal immune response and help to decrease viral shedding.

Not all are created equal

The best source of colostrum for a newborn calf is the mother. If that is not an option, the next option would be a donor cow from the same herd. Usually the older the cow, the better antibodies she can provide. Healthy cows with a solid vaccine history are ideal. Colostrum can be stored in quart bags in the freezer for up to one year. It is important to remember that heat from the microwave can denature the IgG antibodies. A

water bath with temperatures below 140 degrees Fahrenheit is the best environment to thaw colostrum.

There are several options for freeze-dried colostrum. Always remember to read the labels.

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— Lindsay Waechter-Mead,
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Colostrum supplements are intended to supplement a calf that has already received some colostrum. Most of the time these supplements contain low levels of IgG and will not provide adequate protection alone. A true colostrum replacement needs to contain at least 100 grams of bovine IgG as well as protein and fat for nutritional requirements. Double-

check to see how to mix the product to ensure proper absorption. Contact your veterinarian for suggestions on which products are best for your operation.

The saying “it takes a village” does not pertain to just raising human babies. Ask for help. There are several factors at play when it comes to proper colostrum management and setting up an appointment with your local veterinarian before calving season begins will help confirm you are ready. Feeding with an esophageal tube can be intimidating, so ask for a demonstration when you pick up supplies. With proper communication and planning, you and your veterinarian can form a solid team to ensure your calving season runs smoothly. **HW**

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