

The Colostrum Counsel

Newborn heifer calves are the foundation of the future dairy. We should do everything in our power to ensure that they have the best possible start in life. The calving environment, neonatal care and colostrum feeding are all practices that contribute to a healthy and productive calf.



NEWBORN CALF MANAGEMENT

Long-term performance begins in the first hour of life

Optimum calf health begins long before a calf is born. Recent studies have shown that dry cow comfort affects her calf's future wellbeing. Dry cows that were adequately cooled throughout their entire dry period gave birth to calves that weighed 14 pounds more at birth. This weight advantage was maintained through weaning. Calves also absorbed colostrum better and had improved immune system function. Those same calves conceived one service earlier compared to heifers born to cows that weren't cooled. Once the heifers freshened, they produced 6 pounds more milk per day for 35 weeks. This is in addition to the 2-11 pound increase in milk per day for 40 weeks seen in the cooled cows themselves. Thus, proper dry cow cooling can really pay for itself!

The calving environment

As calving approaches, the timing of moving a cow to a maternity pen is crucial. The ideal time to move a cow is 24 hours before calving, but the exact time of birth is difficult to predict. If a cow is moved during early labor, she becomes stressed and can actually halt labor for a time. This increases the risk of dystocia and stillbirth. Calves that undergo a more difficult birth are twice as likely to have failure of passive transfer, or FPT. Calves with FPT are much more likely to get sick and/or die from common calf-hood diseases. One way to minimize dystocia is to move the cow when the calf's feet are showing. At this point, the cow is committed and has to proceed with delivery.

Calves should be born into the cleanest environment possible. In a perfect world, there should be one maternity pen for each cow, which is then cleaned and disinfected between cows. Bedding should always be clean and dry to prevent contamination to the calf. The last thing we want is for a calf to leave the clean uterine environment and land nose-first in a pile of manure. The calf then gets a mouthful of viruses and bacteria before it even has a chance to absorb colostrum. To keep calves as clean as possible, stock tanks are an excellent tool. As soon as the calf is born, it is moved to a clean, bedded stock tank. This allows the calf to receive the best stimulation nature can provide via the cow's licking, but the calf can't stumble into a pile of manure or suck on the cow. Once the calf is dry, it is moved to a hutch or pen. The stock tank is then cleaned, disinfected and re-bedded for the next calf. Navel dipping is also important in maintaining calf health. The navel, or umbilicus, contains blood vessels that provide a perfect entryway for bacteria to get into the calf's bloodstream. By dipping the navel, it kills most of the bacteria present and helps dry the stump. It is important to use an actual navel dip, such as 7% tincture of iodine or chlorhexidine. Teat dips often contain high levels of emollients, which prevent the navel from drying. The dip cup should always be clean, as a dirty cup can spread the bacteria we are trying to kill. Multiple studies have shown that calves whose navels are dipped as soon as possible after birth are healthier than calves that aren't dipped.

Colostrum quality

Colostrum is a vital component of newborn calf care. If using maternal colostrum, the cow should be milked less than one

hour after calving to ensure the highest colostrum quality. The longer after calving the cow is milked, the more the colostrum is diluted with milk. Every batch of maternal colostrum should be tested to ensure quality and regular bacterial counts should be performed to ensure proper collection protocols are being followed. Only high quality colostrum should be fed to newborns. Colostrum that tests green via a colostrometer or has a Brix value of 22% or higher is considered high quality. If using a colostrometer, the colostrum needs to be cooled to 22°C or 72°F for an accurate reading. If using a Brix refractometer, the colostrum can be tested at any temperature. A refractometer should be cleaned thoroughly between uses to ensure that no residue is left from the previous sample. It should also be regularly calibrated with distilled water to ensure accuracy.

Colostrum replacers

If maternal colostrum quality control is too challenging, colostrum replacers can be used instead. Current recommendations are that every calf should receive 150-200 grams of IgG from a colostrum replacer in order to prevent FPT. Colostrum replacers should have dried colostrum as their source, as these products provide the best antibody absorption. Serum-based colostrum replacers have variable absorption, which can lead to higher FPT rates. To determine if calves have FPT, blood is taken between 2 and 5 days of age and the total protein is measured. At the herd level, the goal is to have 90% or more of the calves with a total protein reading above 5.2 g/dL. Anything below this cutoff should encourage the farmer to evaluate colostrum management.

When is the optimum window for colostrum feeding?

Timing of colostrum administration is critical. When a calf is born, there are large pores in the gut that allow for antibody

absorption. After 24 hours, these pores close and antibody absorption is minimal. Also, once a calf is fed a meal the pores close at a faster rate. This is to limit bacterial absorption, as bacteria can go through these pores just as easily as antibodies can. If using maternal colostrum, one gallon of high quality colostrum should be administered as soon as possible after birth and definitely before the calf is 6 hours old. If using colostrum replacer, the calf should receive 150-200 grams of IgG within one to two hours of birth, as antibody absorption isn't as efficient as it is with maternal colostrum. The full dose of colostrum should be fed at one time, as antibody absorption decreases to 47% after twelve hours. Additional colostrum feedings can be beneficial even after the gut closes, as colostrum provides a high level of protein, fat and growth factors for enhanced calf health.



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Dr. Lauer is a Professional Services Veterinarian at Animart, Inc. located in Beaver Dam, WI. Originally from Missouri, Dr. Lauer received her Bachelor of Science in Biology and Bachelor of Arts in Chemistry from Missouri Baptist University in 2007. Dr. Lauer graduated from the University of Missouri-Columbia College of Veterinary Medicine in 2011 with a Doctorate in Veterinary Medicine. She was in private large animal practice in central Wisconsin before joining Animart in September 2013. Calves are her passion, as she seeks to improve calf health through improved management practices on dairies, heifer raisers, and dairy beef operations throughout Wisconsin. She is married to a dairy farmer and also raises dairy goats as a hobby.

1. Smith, Bradford P. "Chapter 19: Initial Management and Clinical Investigation of Neonatal Disease." *Large Animal Internal Medicine*. St. Louis, MO: Elsevier Mosby, 2015. 286-293.
2. Smith, Bradford P. "Chapter 21: Colostrum and Milk Replacers." *Large Animal Internal Medicine*. St. Louis, MO: Elsevier Mosby, 2015. 339-43.

ASK THE EXPERT

How long can you store your own colostrum?

After collecting and testing your own colostrum with a Brix refractometer or hydrometer, colostrum that is not going to be used for immediate feeding can be stored in two different ways; cooled in the refrigerator or frozen in a freezer.

If the colostrum is going to be fed later in the day or within 24 hours, it can be refrigerated between 1 to 1.5°C (33 to 35°F).

If the colostrum is not going to be used before 24 hours, it can be frozen within the first hour of collection at -20 to -21°C (-5°F). This colostrum could be used safely for about 6 months and some would argue that it can be used for up to a year.

It is important to remember that repeated freeze thaw cycles

dramatically damage and affect the functional antibodies in colostrum and therefore life span of the frozen colostrum is reduced.

What are the best containers for storing colostrum?

The best way to store colostrum is in 1 to 2 L (quart) bags or containers because the smaller volume allows for quicker cooling to slow bacterial growth and to preserve the viability of cellular components and immunoglobulins.



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