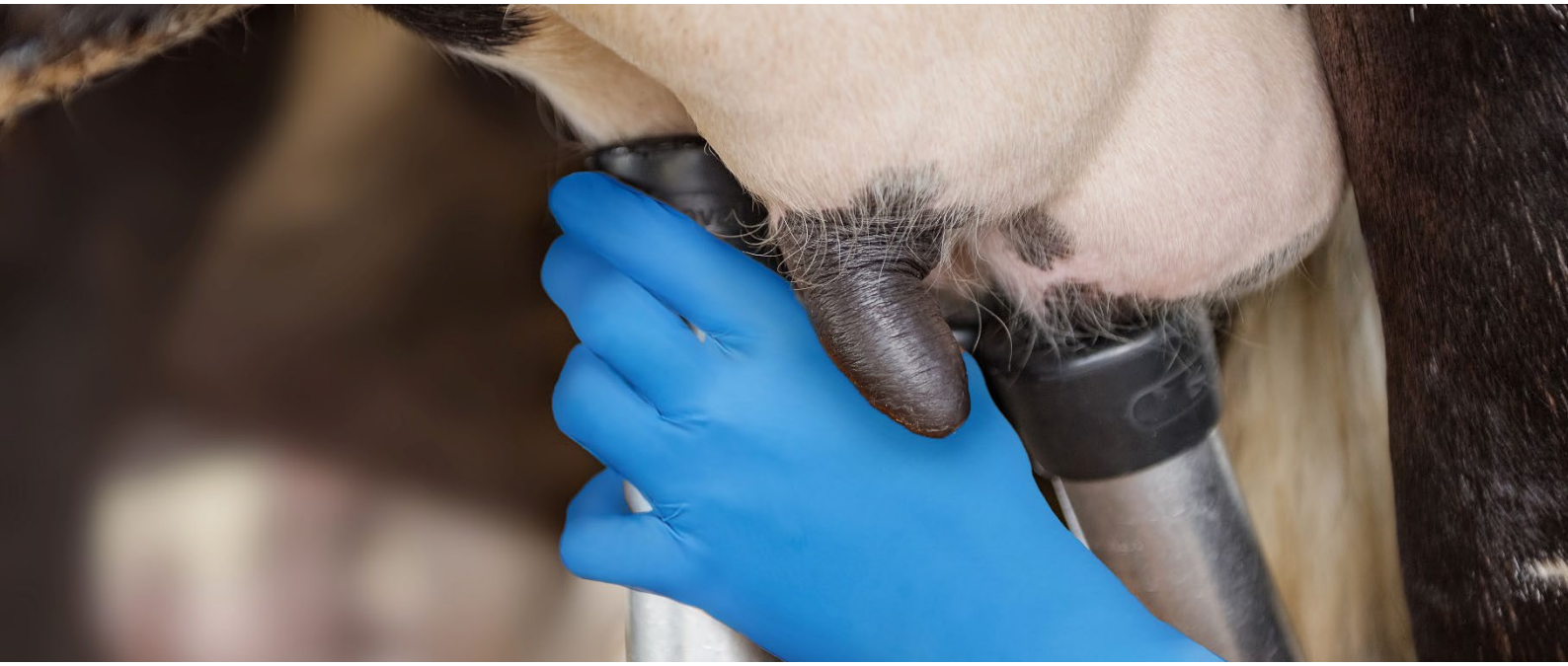


By HANNE SKOVSGAARD PEDERSEN, DVM, PhD and Calf Specialist for coloQuick International

Good hygiene is a cornerstone of optimized colostrum management

For a heifer calf, colostrum is one of the most decisive factors for future milk yield. Improving colostrum management is simple and does not require large investment of money - but remember, with every calf you only have one chance to do it right.

Four key areas to focus on when optimizing colostrum management:

1. How improving colostrum management can increase the **profitability of your farm**
2. Why measuring **colostrum quality** is crucial
3. Why the **time to first feeding** of colostrum is critical
4. Why the importance of **good hygiene** while collecting and feeding colostrum cannot be understated

This is the last of four articles focusing on why **good hygiene** when handling colostrum cannot be understated.

About Hanne Skovsgaard and coloQuick International

Dr. Hanne Skovsgaard Pedersen, DVM, PhD is a calf specialist with experience as large animal veterinarian and researcher. She focuses on staying current with scientific publications and developing literature that explains the biology of the calf. She is passionate about the dissemination of knowledge and optimizing calf management on farms around the world.

coloQuick International is a division of the Danish company, Calvex A/S (est. 1992). At coloQuick we supply products and expert level advice, to increase farm profitability and reduce the use of antibiotics in dairy herds by focusing on the first hours of a calf's life.

Colostrum is extremely valuable for your herd and an important factor in the production of good calves and healthy, high producing dairy cows. Antibodies in colostrum are critical to the calf's health, growth and future milk yield. To maximize the absorption of antibodies, it is important to maintain good hygiene at all stages of colostrum collection and feeding.

Good colostrum hygiene is the basis for greatest possible transfer of antibodies and nutrients to the calf. Maintaining good hygiene requires attention to detail when cleaning equipment, but also how colostrum is handled and stored (e.g. temperature, time) (see Figure 1). By focusing on these key areas, it is possible to maximize the benefits of colostrum and reduce risk of disease.

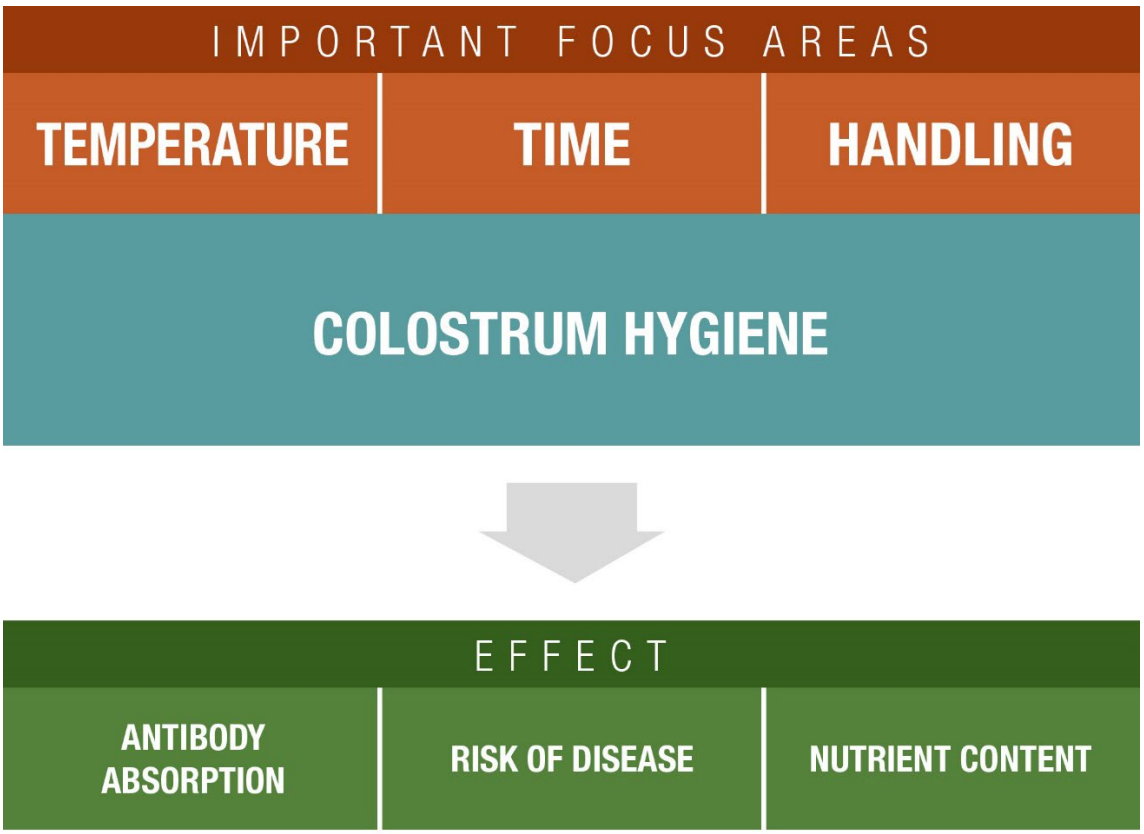


Figure 1: *Colostrum hygiene is affected by temperature, time and handling procedures. Good colostrum hygiene is the basis for ensuring a high absorption of antibodies, a low risk of disease, and high nutritional quality of colostrum.*

Colostrum must be handled carefully

Normally, colostrum contains low levels of bacteria immediately after milking. It's how colostrum is managed that will ultimately determine how many bacteria is fed to the newborn calf.

Colostrum is very nutrient dense which makes it an excellent growth media for bacteria. Fresh colostrum is also approximately 38°C; this high temperature further promotes bacterial growth. Under these nearly optimal growth conditions, many types of bacteria are able to grow and divide every 20 minutes. This means that a small number of bacteria can multiply quickly (see Figure 2).

The level of bacteria in colostrum should ideally be at the same level as high-quality tank milk when fed to the calf. To prevent bacterial growth, it is therefore important for colostrum to be portioned out and stored at low temperatures immediately after milking.

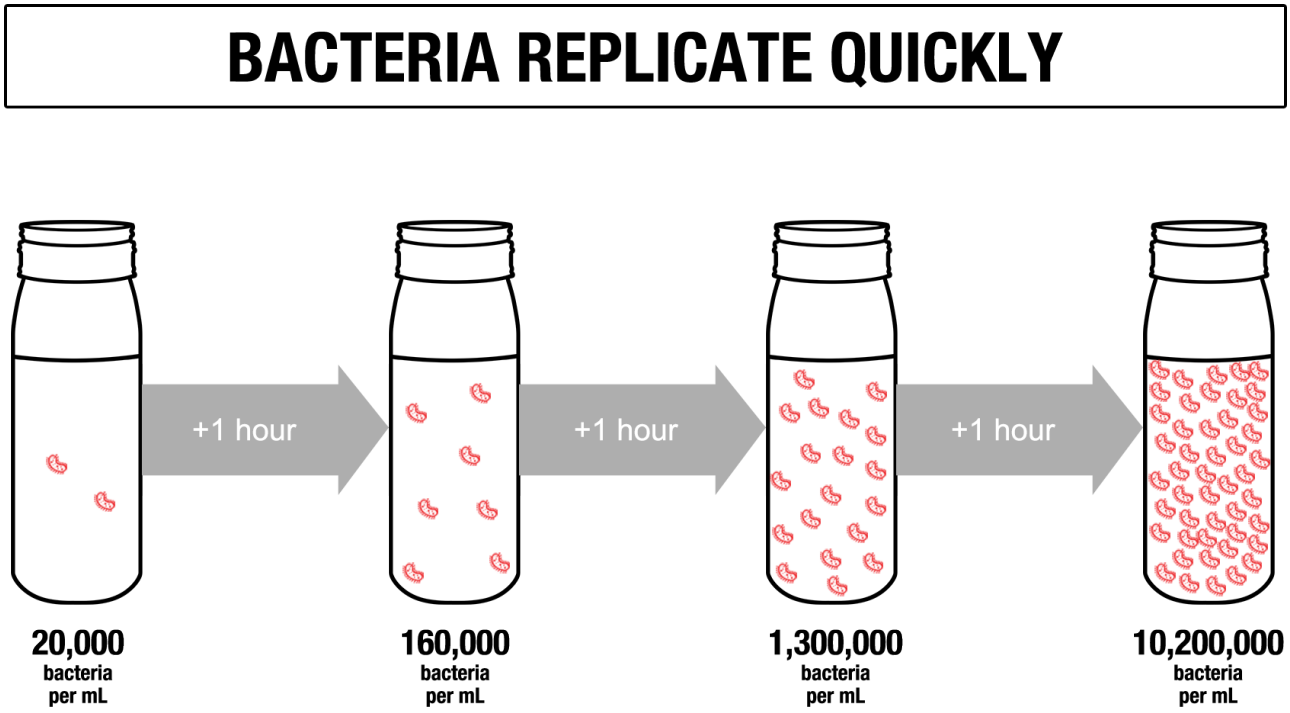


Figure 2: *If colostrum is not handled correctly, the number of bacteria will increase substantially every hour. This also applies to colostrum that was milked hygienically and which therefore generally contains low levels of bacteria. If you leave the colostrum at high temperatures for a longer period, the number of bacteria will increase drastically.*

Poor hygiene can ruin everything

Research has shown that a high concentration of bacteria in colostrum reduces the calf's ability to absorb antibodies from the intestine to the bloodstream (Godden et al. 2012, Gelsinger et al. 2015) (see Figure 3). Different mechanisms are suggested to explain the negative relationship between colostral bacteria counts and antibody absorption, such as a) bacteria may be bound to antibodies in the lumen of the intestine, thereby decreasing antibodies available for absorption, b) attachment of bacteria to intestinal cells thereby lowering the number of antibody absorption sites or c) damage of intestinal cells capable of taking up antibodies (Corley et al. 1977, James et al. 1981).

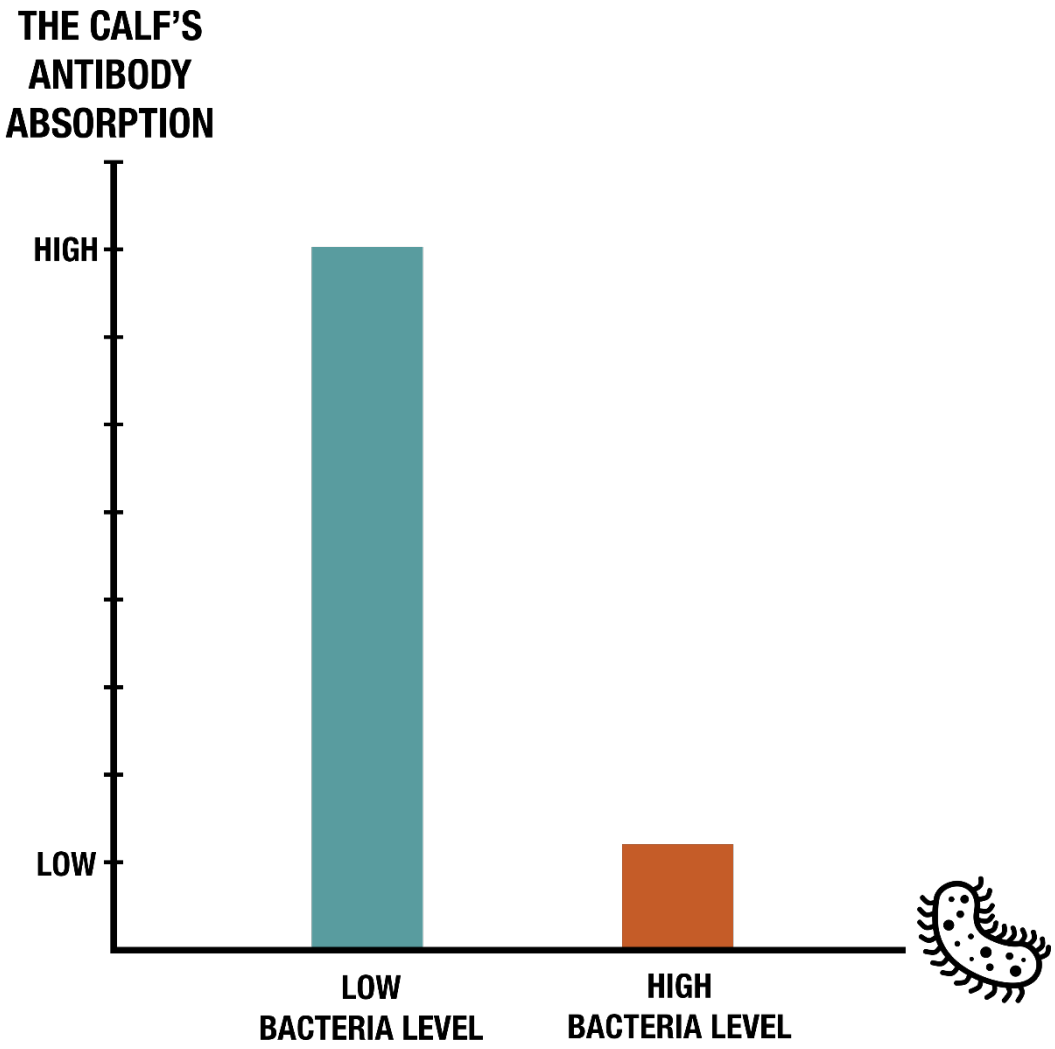


Figure 3: *A high number of bacteria in colostrum reduces the calf's absorption of antibodies from the intestines to the bloodstream.*

No weak links between milking and feeding

Good colostrum hygiene depends on maintaining a focus on all the procedures involved from milking the dam to feeding the calf (see Figure 4). By doing this, the number of bacteria added to and multiplying in the colostrum is reduced.

Figure 4: *Good colostrum hygiene is ensured by focusing on how the milk is handled every step of the way from milking to feeding.*

Pasteurization does not compensate poor hygiene

Pasteurizing colostrum by heat treatment at 60°C for 60 minutes, reduces the risk of disease transmission by killing specific pathogens. In this way, pasteurization of colostrum, can be used as a tool in eradication programs against herd diseases, such as Salmonella. However, pasteurization cannot compensate for a lack of hygiene. A high bacterial level negatively affects the nutritional value of colostrum. In addition, there is a concern that preformed toxins or by-products from bacterial death after pasteurization, could cause harm to newborns (Moore et al. 2009).

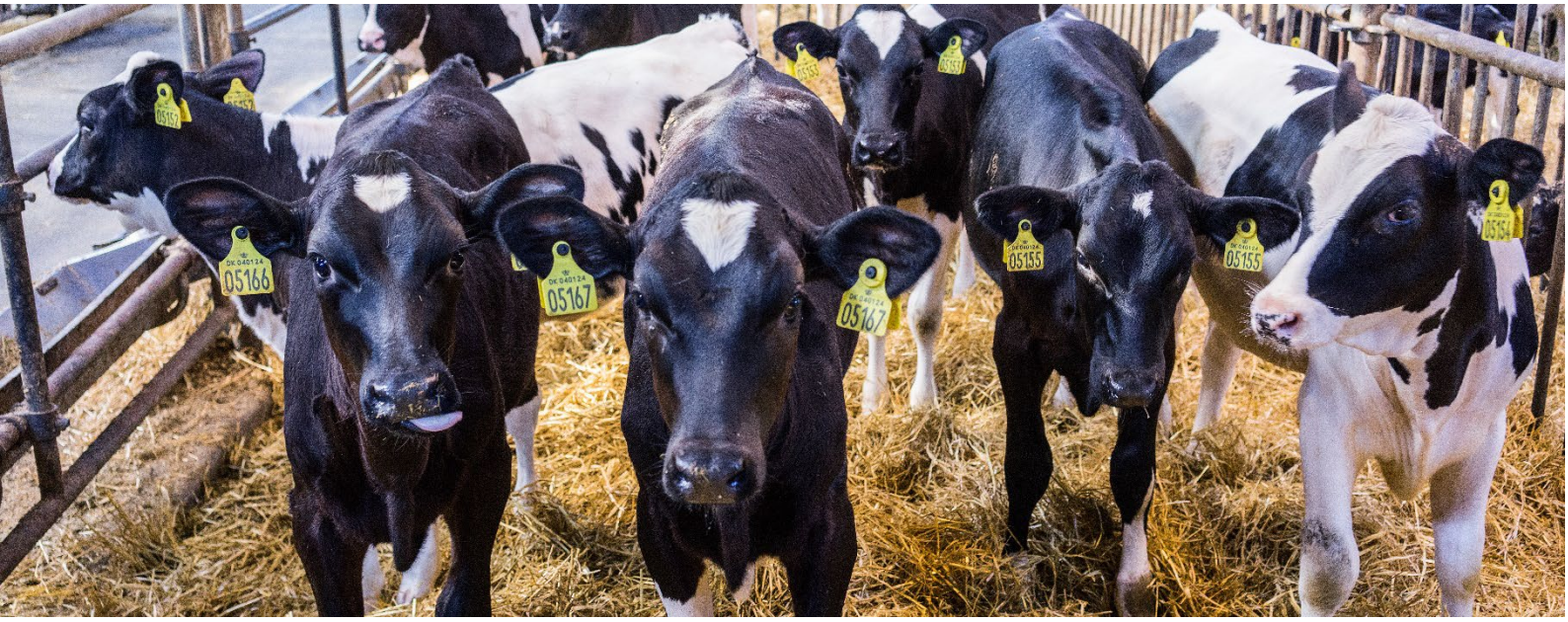
A systematic approach and good routines ensure high colostrum quality

Good hygiene, sorting for colostrum with a high concentration of antibodies, and quick feeding are all essential pieces of an optimized colostrum management program.

Hygiene is often the most challenging aspect of colostrum management because bacteria are invisible, and it can therefore be difficult to assess whether or not, your protocols are effective. It is helpful to take a systematic approach and follow properly outlined procedures, which ensures quick processing and hygienic handling and storage of the colostrum. This minimizes the risk of disease and maximizes antibody absorption efficiency, which creates a solid foundation for raising healthy calves becoming high producing dairy cows.

The three most important points of the article:

1. Antibodies from colostrum forms the basis for producing good calves and strong cows
2. Good hygiene is a cornerstone for high antibody absorption
3. A strong focus and a systematic approach ensures a high hygienic level in colostrum



Lille Skovsgaard is owned by Steen Skov and driven in cooperation with Kristian Skov.

A systematic approach ensures good colostrum hygiene

Good colostrum hygiene is the basis for ensuring the optimum transfer of antibodies and nutrients to the calves. At Lille Skovsgaard, this is achieved through a strong focus and systematic procedures.

"Our facility has to be so clean that ladies could wear high-heeled shoes." These were the words of Steen Skov who, together with his son Kristian Skov, manages the dairy.

This commitment to keeping everything clean also applies to colostrum management. Two employees are responsible for caring for the newborn calves, Adhanom Tewelde and Sorin Anton. They have been given detailed protocols and a cleaning schedule. These protocols are followed to the letter and this is the key to their success. Well-described procedures, a systematic approach and follow-up at weekly farm meetings are key concepts.

Fast, hygienic colostrum handling

When a calf is born, a portion of colostrum is retrieved from the freezer and placed in the coloQuick water bath for warming.

The colostrum is fed to the calf as quickly as possible after birth in order to maximize the absorption of antibodies.

If cows have calved during the night, feeding colostrum is the first thing they focus on in the morning. After each feeding of colostrum, the feeding equipment is cleaned using warm water and detergent.

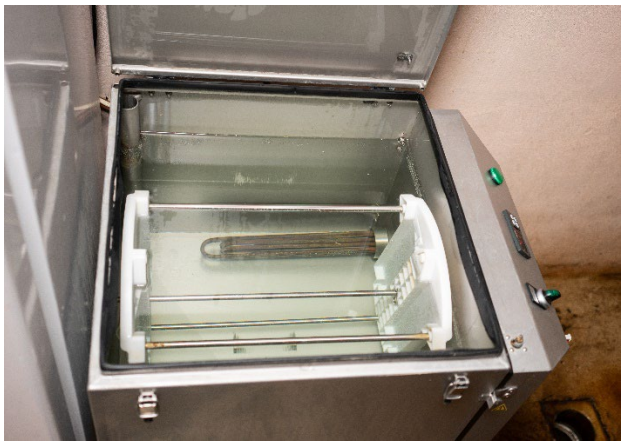
Thorough cleaning using detergent ensures that all fat and proteins are removed and do not act as a growth medium for bacteria.

After the calf is fed, the cow is milked with a clean milking device and milk pail. The colostrum filling station is placed on the wall close to the milking bail, making it easy to pour the colostrum into single-use bags and place it in the freezer right away.

“In our herd, the colostrum is frozen within 15 minutes of milking to ensure that bacteria do not multiply and lower the quality of the colostrum,” explains Kristian.

The filling station is cleaned after every use and it is also thoroughly disinfected once a week. The coloQuick water bath is kept clean by relying on fixed routines for how often it should be emptied, cleaned with soap and filled with new water.

Storing the herd’s best colostrum in single-use bags allows the colostrum to freeze quickly, which prevents bacterial growth



Regularly cleaning the colostrum handling equipment, including the water bath, ensures good hygiene throughout the system.

Focus and a systematic approach are key concepts

“We have written protocols for all cleaning procedures. This eliminates any doubt concerning when and how the work should be done.” explains Kristian. “We find a schedule works well for our farm, since cleaning is something that can easily be forgotten on a busy day with lots of other work to do.”

Adhanom and Sorin are pleased with the coloQuick system. They went on to tells us, “It is simple to use and makes it easy to standardize all procedures involving colostrum and it ensures that everyone does things the same way. It is also possible to catch up on other smalls jobs while the colostrum is thawing in the water bath, which works well for our two-person team.”

At Lille Skovsgaard, there are opportunities for continued improvement with respect to calf management, but they find that adopting a systematic approach helps. Through the use of the coloQuick colostrum management system and a commitment to maintaining excellent hygiene, they have a solid base from which to further improve their calf program.

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