



By Dr. Hanne Skovsgaard Pedersen, DVM, PhD and Calf Specialist for coloQuick International

Not All Gold Glistens

Most people are familiar with Shakespeare's famous expression "All that glistens is not gold" - but when it comes to colostrum, a reversal of meaning is true. 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 first of four articles focusing on how colostrum management affects **profitability of your farm**.





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.



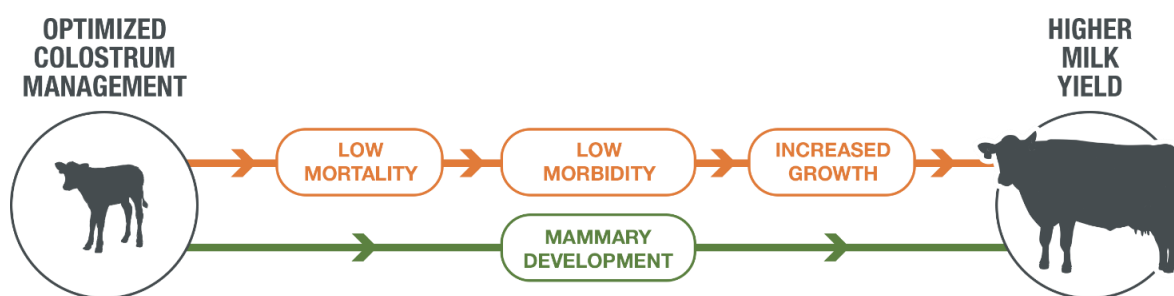
For any business owner looking to make a change, the first thing they'd want to find are the "low-hanging fruit" – i.e. the small adjustments that make a big difference giving a positive effect on profitability. For a dairy farm, raising good replacement heifers is the most cost-effective way to secure future milk production in the herd. For any farm that seeks to improve the profitability of their operation, it would be a good idea to start by looking at their calves.

Colostrum is the most important meal in the calf’s life

Colostrum management is a critical control point that requires special attention in order to maximize a heifer calf's full milk-yield potential. Besides essential nutrients, colostrum contains many bioactive compounds, including antibodies. Numerous research trials have shown that the substances in the colostrum have a positive effect on the calf’s physiology – during the calf’s early life and later in adulthood (Figure 1).

The nutrients in the colostrum provide energy and building blocks for sustenance and growth. The bioactive substances influence the metabolism and hormone production in the calf. These hormones are known to promote the differentiation of cells into specialized tissues and organs through increased protein synthesis and cell growth. Colostrum also affects the development of the intestinal mucosa, as well as the absorption of antibodies and nutrients, further impacting on the growth of the calf.

The calf is not provided with antibodies from its mother during the pregnancy. This means that the antibodies in the colostrum will serve as the calf's main defense against pathogens for the first 2-3 weeks after calving, until the calf establishes its own active immunity. Feeding high quality colostrum as soon as possible after birth, is crucial for maintaining calf health and maximizing growth in the first months of the calf’s life. Several research trials have shown a direct connection between optimizing colostrum management and a higher milk yield, due to the positive effect of colostrum on the development of the heifer’s udder and later milk yield.



Scientific papers:

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| Elsobaby et al. 2019, | Vallati-Riboni et al. 2018, | Faber et al. 2005, |
| Hare et al. 2019, | Soberon & Van Amburgh 2017, | National Dairy Heifer Evaluation Project 1993, |
| Stenkamp-Strahm et al. 2018. | Windeyer et al. 2014, | DeNise et al. 1989 |
| Urie et al. 2018a, | Soberon et al. 2012, | |
| Urie et al. 2018b, | Furman-Fratzak et al. 2011, | |

Figure 1: Scientific studies demonstrating a positive effect of colostrum on later milk yield



Effects on various measures of performance and farm profitability

Published research has shown that improving colostrum management consistently results in positive effects on various production parameters among calves, young stock and dairy cows. Repeated incidences of diarrhea and respiratory infections in early life have a negative effect on potential milk yield. Seeing improvements in calf health and growth performance means that the heifers will be ready to be bred early and physically large enough by their first calving. In addition, an earlier age at first breeding, combined with increased longevity, will increase both the dairy cow's lifetime yield and financial contribution to the profitability of the herd.

Table 1 shows the estimated financial gain from optimizing colostrum management, taken from four sources. The estimated values vary between the four sources because of different farm conditions and types of production parameters included, as well as differences in the procedures for calculating the total economic impact. However, the final estimation of the economic impact of improving colostrum management is always positive.

All sources predict a significant financial gain from improving colostrum management. The most important factors are longer productive lives in the herd and increased milk yield. The calculations used in Campos (2015) are based on the measured increase in milk yield in the first and second lactations of the cows, corrected for the lactation number. This results in a relatively higher estimate (EUR 243 per cow per year) compared with the other sources. If it is assumed that the lifespan of the cows is increased at the same time, the Campos estimate can realistically be achieved.

TABLE 1: ECONOMIC IMPACT OF IMPROVED COLOSTRUM MANAGEMENT

	USA	CANADA	DENMARK	DENMARK
VALUE OF (EUR):	Faber et al. 2005 ¹	Campos 2015 ¹	Røntved et al. 2012 ¹	SimHerd calculation ² (coloQuick Int. A/S, 2016)
Lower mortality		32	21 ³	8
Fewer treatments	9	9		
Reduced costs replacement heifers	33			
Lower culling rate		142		
Earlier 1st calving		124	35	
Increased milk yield	103	243	112	87
Extra income per cow per year	145	550	168	95
Extra income per 200 cows per year	29,000	110,000	33,600	19,000

¹ Contribution margin: EUR 0.19 per kg milk

² Simulation using the SimHerd model was performed by coloQuick International

³ Overall financial gain caused by lower mortality and fewer treatments



What will improving colostrum management do for your herd?

Based on the research, we can conclude that optimizing colostrum management will result in calves that grow up to be cows that produce more milk. By concentrating your efforts on raising replacement heifers that become healthy cows with increased longevity, you will increase your rolling herd average over time. It's important to note that you don't need to see record breaking animals to see increased profitability. Giving all calves the best start in life will result in more high-yielding, older cows in your herd, increasing the average yield (Figure 2).

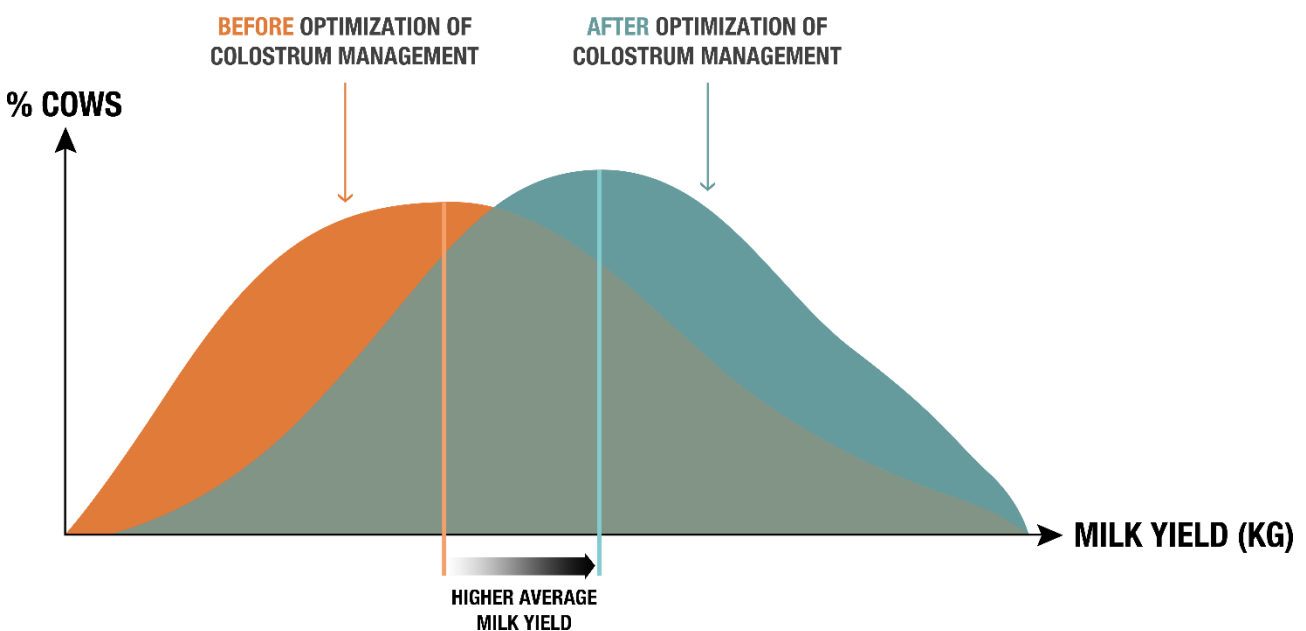


Figure 2: Optimizing colostrum management increases the herd's average milk yield

A realistic way to achieve this increase in your rolling herd average for milk production is shown in Figure 3. The average milk yield in a herd is assumed to increase by 600 kg (Figure 3a), as a result of a change in the composition of the herd in relation to milk yield (Figure 3b).

With an expected contribution margin of EUR 0.19 per kg milk, the annual financial gain will amount to EUR 114 per cow per year, i.e. EUR 22,800 for a herd of 200 cows.

This estimate is conservative, since the predicted increase in milk yield is set relatively low, and no additional income has been calculated for any other benefits at the same time in other production parameters.



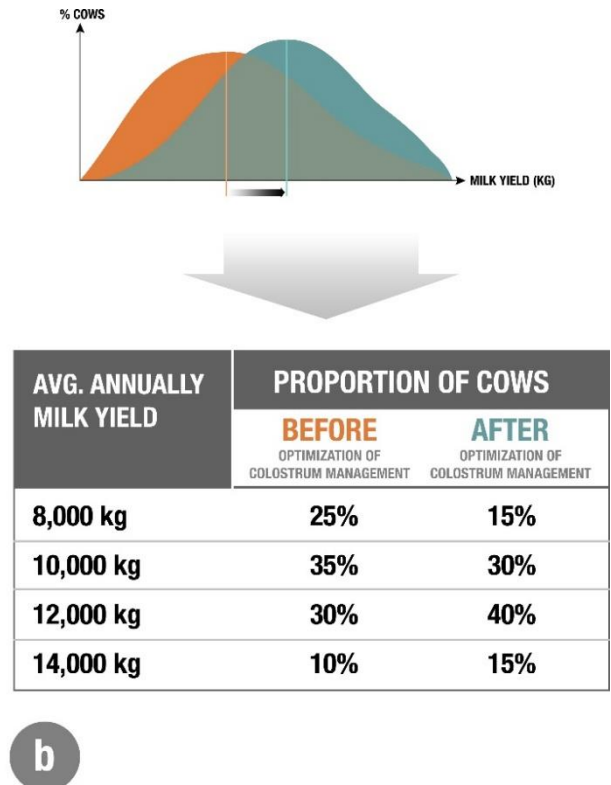
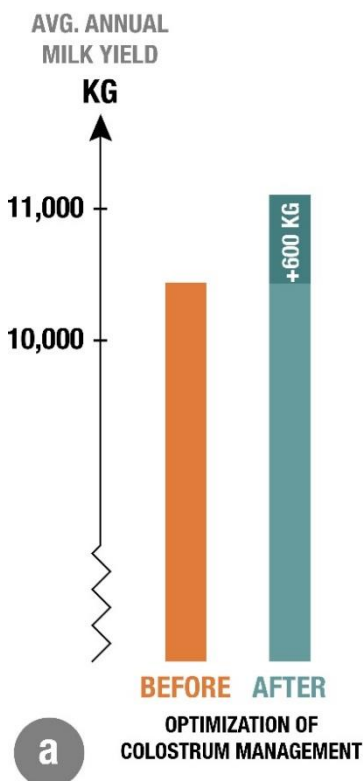


Figure 3 a) Optimizing colostrum management results in an increase of the herd's average milk yield (+600 kg) caused by **b)** a change in the composition of the herd (more high-yielding, older cows in the herd)

It's important to consider that this potential for this additional revenue from increased milk production by optimizing colostrum management requires a relatively small investment in your calf rearing program. Of the total costs in the calf rearing period, about EUR 1,400 per heifer (Clausen 2014), this investment in colostrum management amounts to about 0.5% (Figure 4).

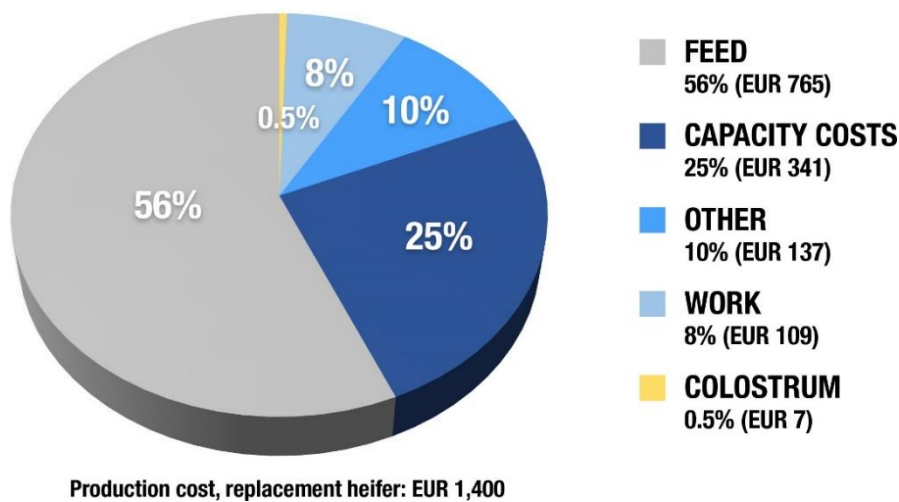


Figure 4: The investment in an optimized colostrum management amounts to 0.5% of total production costs



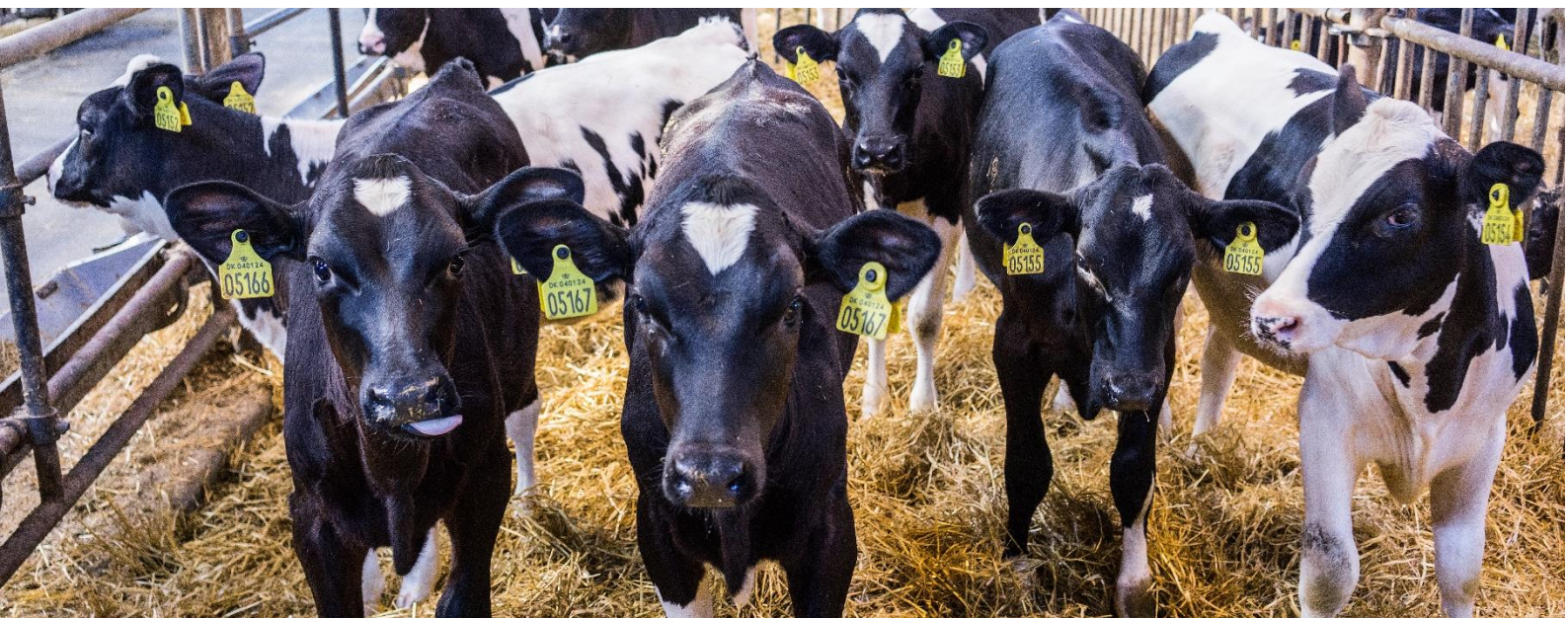
Determination leads to change – and optimized production

Feeding high quality colostrum, as soon as possible after birth, will lay the foundation you need to produce healthy calves and higher producing, longer lasting cows. Optimizing colostrum management is therefore an important but simple means of improving the productivity and profitability of your herd. The investment made in improving colostrum management requires determination and focus, but financially, it is not much compared with other costs associated with raising replacement heifers.

As a farmer, you fully understand the concept of "you reap what you sow". This expression also applies to your calf production and if colostrum quality is not optimized, then your cows will never be performing at their highest potential. On the other hand, if you choose to focus on a good start for the heifer calves, your efforts will pay off by increased milk yield and improved cow longevity.

The three most important things to remember:

1. Colostrum is the calf's first and most important meal.
2. Colostrum is a critical control point for raising healthy calves and strong, high producing cows that stay in the herd.
3. Making a commitment to optimize colostrum management is a relatively small investment with a potentially huge economic impact.



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