

# DAIRY MANAGEMENT

## COLOPHON:

Veepro Dairy Management is a supplement to the Veepro Magazine. It contains articles, tips and advice aimed at the management of dairy farms worldwide.

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## CALF RAISING STARTS WITH COLOSTRUM

*Very often calf raising doesn't get the attention it needs. Fortunately the tide seems to be turning in the dairy farming industry in this respect. Slowly people are starting to realize that only a properly raised calf can develop into a good milking cow. De first colostrum feeding is a critical ingredient.*

There are two ways of looking at replacement rearing. One is to look at it as a necessary evil. Indeed, calves are not productive. They cost time and money without any direct returns.

That's why a calf shouldn't require too much attention.

### Chain of management

The second way of looking at calf rearing assumes that a

A new born calf deserves at least as much attention and time as a highly productive cow.

dairy farmer should give lots of time and attention to calf raising. This approach has calf raising as one of the most important links in the chain of management that leads to a highly productive milk cow. And it is the weakest link that determines the overall strength of the entire chain. In other words, it is important to strengthen all the links in the chain, also the link of calf raising. Dairy farmers, researchers, and certainly the dairy feed supply industry are increasingly aware of the importance of optimal calf raising practices in order to produce tomorrow's milk producers. A newly born calf deserves at least as much attention and time as a highly productive milk cow.

# FEED FIRST COLOSTRUM QUICKLY

A newly born calf cannot do without colostrum. It holds the required antibodies a calf needs to build up its own resistance once it is born.

For an optimal start it is very important that the calf receives colostrum. This means that it needs to receive its first colostrum feeding as quickly as possible, or at most within one hour after its birth. There are a number of reasons for the need to feed colostrum so soon.

- During calving a calf may be infected with a number of pathogens. Colostrum is the best medicine available to fight and neutralize these pathogens.
- The intestine walls of a newly born calf are completely open. This means that the animal can absorb complete protein molecules via the uterine wall into the bloodstream. This is how a calf receives essential feed ingredients optimally. The intake capacity of immunoglobins through the uterine wall decreases during the first 24 hours from almost 100% right after birth to about 20% one day later. This is due to a decreased pH in the abomasum. This drop in pH that commences right after calving causes the immunoglobins to break down when passing through the abomasum.
- The quality of colostrum diminishes quickly after calving. This is also because the colostrum dilutes with each subsequent milking.

## At least two days

Of course things don't stop after the first colostrum has been fed. The question is how long a dairy farmer must or should continue feeding colostrum. The answer to this question is not that simple. Two days of colostrum feeding is the minimum but there is nothing against feeding colostrum for a longer period of time. Some dairy farmers feed colostrum to their calves as long as three or four days. Even though this may not have a very positive effect on the overall resistance mechanism, it does positively influence the resistance at intestine level. It is evident that high quality colostrum benefits a calf the most (see box). Even if the quantity is not very large this is still preferred over a large quantity of medium quality colostrum, even when a calf gets enough of this.

Ad a little bit of fresh buttermilk to the colostrum. It stays longer fresh.



## How often?

There are a number of rules of thumb that apply to colostrum feeding and they answer such questions as how often, how much, and how fresh. The key is to feed as much **fresh colostrum** as **quickly as possible** and as **often as possible**. Let's start with how often? A healthy abomasum needs about 5 hours to digest the first feeding of 1.5 liters. This means that the calf can be fed four times during the first day with five-hour intervals. This is an absolute



Registration of the colostrum quality gives an indication whether the feeding is in balance during the dry period of the cow.

must in order to make the best use of the open intestine wall. The second and the next couple of days the farmer can stick to this schedule of feeding every five hours.

## How much?

There is quite some discussion about the amount of colostrum. Knowing that the volume of the abomasum of a newly born calf is no bigger than 1.5 liters, a first feeding of 1 to 1.5 liters is desired. Feeding too much colostrum **in one time** is not good. Feeding more than 1.5 liters may result in the abomasum flooding over and some of the colostrum ending up in the rumen. This may result in digestive disorders.

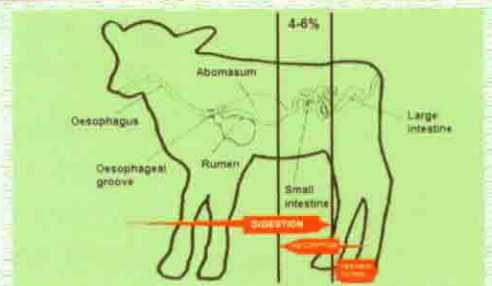
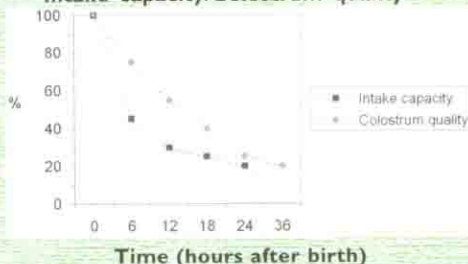
## How fresh?

In order to make the best use of fresh colostrum, fully milk the mother cow right after calving. The earlier this is done, the better. This holds the advantage of having high quality colostrum available for a larger number of feedings, allowing the calf to benefit the most from the first colostrum. Preserving colostrum is a point that needs attention. It should be stored hygienically and in a cool place. In order to prevent the colostrum from spoiling, it is recommended to sour it with fresh buttered milk.

A colostrum-meter gives a good indication for the quality of the colostrum. If colour of the meter turns in to green, the colostrum has a concentration of 60 to 140 immunoglobins.



Intake capacity/Colostrum quality



## 100 % INTAKE OF IMMUNOGLOBINS

The intestine walls of a newly born calf are completely open. This means that the animal can absorb complete protein molecules via the uterine wall into the bloodstream.

The colostrum goes straight to the abomasum and not to the rumen. This is how a calf receives essential feed ingredients optimally. The intake capacity of immunoglobins through the uterine wall decreases during the first 24 hours from almost 100% right after birth to about 20% one day later.

# MEANS OF FEEDING

There are a number of methods for feeding colostrum to a newborn calf.

- teat feeding
- bucket feeding
- suckling
- milk probe

## - Teat feeding

This is the most common and also the best method whether it is with a bottle with teat or a bucket with teat. Via the teat feeding method the milk arrives at the place of destination, the abomasum, as naturally as possible. The swallow reflex works optimally with this method while it is also the best means of feeding cold milk.

## - Bucket feeding

A calf learns to drink from a bucket straight away with this method. There is a chance though that an irregularly drinking calf's swallow reflex doesn't work properly.

## - Suckling

A dairy farmer may also decide to leave the calf with her dam for a number of days. A commonly heard argument in favor of this method is that the calf will at least drink enough colostrum. This isn't always the case though. Research indicates that many calves don't drink enough colostrum and don't get it soon enough. They don't tend to drink right after calving. Hygiene is another factor. The teats and udder of the cow are not always clean freeing the way for pathogens.

## - Milk probe

Some dairy farmers have outstanding experience with milk probes. The overall advice though is to only make



Teatfeeding is the most common en the best method whether it is with a bottle with teat or a bucket with teat.

use of these if a calf will not drink by itself, after a heavy birth for example.

## Post-colostrum feeding

After colostrum a dairy farmer can switch to cow milk or milk replacer.

Both have their advantages and disadvantages. It is quite important for a growing calf to be fed consistently time-wise as well as method-wise.

Feeding her milk replacer one time and natural cow milk the next is not recommended.

Furthermore it is very important that the composition of the milk is constant. It is in fact preferable to feed milk replacer because its composition is very constant.

The composition of colostrum in percents (according to Lenkheit).

Time	Water	Proteins		Fat	Lactose	ASH
		Casein	Albumin-globulin			
Calving	66.4	5.57	16.92	6.5	2.13	1.37
after 12 hours	79.1	4.47	8.98	2.5	3.51	1.04
after 24 hours	84.4	4.23	2.63	3.6	4.24	0.97
after 36 hours	80.8	4.08	1.64	2.1	4.14	0.95
after 48 hours	86.3	3.91	1.23	3.7	4.51	0.93
after 60 hours	86.0	3.62	1.08	3.7	4.38	0.91
after 72 hours	86.0	3.55	1.06	3.9	4.63	0.99

The amount of antibodies available at different amounts and different times of feeding.

Amount of colostrum	Hours after calving	IgG	IgM	IgA
0.5 litres	At birth	5,2	1,4	1,1
	4 hrs	4,5	1,4	0,9
	8 hrs	4,8	1,2	1,0
	12 hrs	2,3	0,8	0,7
1 litres	At birth	8,5	2,4	2,3
	4 hrs	7,2	2,0	2,2
	8 hrs	6,4	1,6	1,8
	12 hrs	5,8	1,4	1,7
1.5 litres	At birth	11,7	3,0	2,6
	4 hrs	10,3	2,5	2,2
	8 hrs	8,5	2,0	1,6
	12 hrs	6,9	1,5	1,5

## GOAL

In order to improve a number of management practices, it is important to formulate goals.

Make sure you define goals that are achievable in practice. When it comes to calves, there may be a number of goals they need to meet when they enter production as two-year-olds. For example, one goal could be that they should be 24 months old when they calve out for the first time.

And after calving they should have a weight that amounts to approximately 85% to 95% of their weight as a mature cow.

Moreover, the body condition of a fresh two-year-old should be 3 to 3.5. A lot of efforts are required from the dairy farmer and his employees to achieve these kinds of goals.

One requirement is that the replacer is properly mixed though. Another advantage of milk replacer is that there are no problems if this soured product goes cold. In the case of natural milk, a calf tends to drink regularly. One disadvantage of cow milk is that there is a chance of the cow vertically infecting a calf via the milk with for instance Johne's disease. Moreover, the composition is a little different every day.

### Raising schedule

It is important to stick to a raising schedule.

This schedule shows when and how much milk is fed to a calf every day during the raising period.

This schedule should be present at every calf pen so everybody knows what and how much each calf should be fed.

Some dairy farmers have outstanding experience with milk probes. The overall advice though is to only make use of these if a calf will not drink by itself.



## AIM FOR 7 TO 8 LITERS OF HIGH QUALITY COLOSTRUM

Any dairy farmer can quite closely control the quality of colostrum. It is quite important to finetune the ration at the end of the dry period for the production of high quality colostrum. Don't overfeed cows but short feed them slightly instead.

Overfeeding results in diluted colostrum while the calf should be receiving high quality, concentrated colostrum instead. During the 8-week dry period a cow is preparing for her next lactation. This preparation is fully geared towards her new calf that she is due to. She will start by producing colostrum for this calf.

The goal is to produce high quality colostrum as it contains high levels of immunoglobins that are so important to the calf's resistance mechanism.

A fresh cow producing no more than 7 to 8 liters of colostrum is ideal. If she produces more, the effects are counter-active. The amount of antibodies doesn't increase with a higher colostrum yield. On the contrary, the colostrum is diluted and given the fact that a new-born calf can only drink a limited amount of colostrum, it will not receive enough antibodies via diluted colostrum.

### REGISTRATION OF COLOSTRUM QUALITY

Cow No.	Calving date	Bull	Heifer + Farm No.	Immunoglobulin Concentration			REMARKS
				140-60	50-30	< 30	
801	01/01/02	X	201	120			
903	02/01/02				45		NOT MUCH

January 2002,  
Calf raising

### REGISTRATION OF COLOSTRUM QUALITY

Cow No.	Calving date	Male calf	Heifer + Herd No.	Immunoglobulin Concentration			REMARKS
				140-60	50-30	< 30	
01	01/01/02	X	201	115			
02	02/01/02				45		Only 1.5 litres

January 2002,  
Calf raising

A good registration is essential. It can be done like this models for bulls and male calves.

### Controle

Nowadays, the colostrum quality can be fairly easily controlled by means of a so-called colostrum measuring device.

By means of a measuring glass and a measuring device one can easily determine the colostrum quality at the farm. The farmer can use this information to optimize the quality of the dry cow feeding ration. It is any farmer's goal to give his calves the best start possible.

### ADDITION

In the last issue of Veepro Magazine the author of the mastitis prevention article has not been listed. Bart Gietema of IPC Livestock in Oenkerk wrote this article.