



**Schils**

Specialist in Young Animal Nutrition

## Technical Bulletin

### Calves deserve a Turbo Start



Providing colostrum to calves goes wrong too often. There is a lot of knowledge about colostrum, but applying it consistently and properly proves a difficult task in practice. Improvement in dispensing and hygiene is necessary at many companies. Several studies have shown that colostrum supply is directly correlated with mortality, diseases, growth, feed efficiency, calving age and production in the 1st and 2nd lactation. A good start immediately means less labor, lower rearing costs, less antibiotic use and a well-developed calf with good immunity. However, the sterile placenta of the cow does not allow immunoglobulins to pass through. This means that the calf is born without any resistance to pathogens. The first priority after birth therefore is to build up immunity and that means providing colostrum. In this bulletin we will discuss the most important steps of colostrum management.

#### Ration of dry cows

Colostrum management after the birth of a calf has a preliminary step, namely the management of the dry cows. When dry cows receive an optimal ration, this ensures vital calves with a good condition at birth and a good start of the mother cow. The ration of the dry cows also has an influence on the colostrum quality. Protein percentage in the ration is often named as the most important control element to improve quality. Unfortunately, this is not easy in practice. The correlation between feed values and colostrum quality has not been proven. The basis (grass, maize or straw / concentrate) of the ration does have an influence on quality. Cows that receive a ration of straw and concentrate in the dry period have the best colostrum quality. In addition to the ration we must not forget that quality is also influenced by the time of calving, length of the dry period, minerals and vitamins, lactation number of the cow, breed and the season.

#### Colostrum hygiene

It is important to milk the cow immediately after calving. If a cow is milked later, the quality of the colostrum present in the udder becomes less because of dilution. The milking of colostrum and its storage must be extremely hygienic. The colostrum in the udder is virtually free of bacteria. The milking process, the use of materials and the storage method (other than refrigeration or freezing) can contaminate colostrum. By feeding contaminated colostrum, the calf gets bacteria directly into the bloodstream and, in addition, bacteria dominate the immunoglobulins meaning that they can no longer be absorbed. Colostrum with a total plate count of <10,000 cfu / ml is seen as ideal, <100,000 cfu / ml is acceptable.

[www.schils.com](http://www.schils.com)

info@schils.com - +31 (0)46-45 99 900



**Schils**

Specialist in Young Animal Nutrition

### Colostrum; what does it actually consist of?

What is actually in the “golden liquid”? In addition to being a supplier of immunoglobulins that develop the passive immunity of the calf, colostrum also contains a boost in the form of energy, proteins, carbohydrates, fat, vitamins and minerals. There are also living cells (white blood cells) in colostrum that stimulate the start of the active immunity of the calf. Pathogens can also be present in colostrum.

Pasteurization has a positive effect on the destruction of pathogens such as coli, mycoplasma, salmonella and ParaTBC. A disadvantage of pasteurization is that the living cells also break down, so you also lose part of the positive effect.

We can classify immunoglobulins in the colostrum into three types: IgG, IgM and IgA. IgG are largely present in colostrum, 70 to 80% of the total number of immunoglobulins. After the miniscule IgG have been absorbed into the bloodstream, they can also leave it again to identify and combat pathogens outside. IgM is a larger protein than IgG. About 10 to 15% of the immunoglobulins are IgM. These remain in the blood and act as the first defense against bacteria and blood poisoning. Finally, the IgA, which protects the mucosal surface in the intestine. It ensures that pathogens cannot attach to the intestinal wall and therefore cannot further develop.

### First feeding(s) after birth

Research has shown that the dry matter content of colostrum correlates with the grams of immunoglobulins per liter (correlation 0.71). With a refractometer (digital or analogue) the dry matter content of colostrum can be measured directly and quickly, i.e. refractive index (Brix value), see figure 1. The quality of colostrum depends on the Brix value and the total plate count. Colostrum of insufficient quality can be replaced with a good quality frozen colostrum or possibly bovine dried colostrum. First colostrum of insufficient quality can be supplied in the second and third feeding. Be careful when using fully bovine dried colostrum as a first feeding:

- Firstly, there is a lot of difference between the quality of an bovine dried colostrum. Always choose a supplier that uses only the first colostrum as a raw material, and not second and third colostrum.
- Note the health status of the product, for example IBR free. Keep in mind that there are immunoglobulins in the artificial colostrum that come from other dairy farms. Colostrum from the own farm / cows is always better, because the immunoglobulins are always company-specific and therefore contain defenses against germs on that specific farm.
- Finally, it is important to know that the intake of immunoglobulins from bovine dried colostrum, or frozen colostrum, is lower than that of fresh colostrum. If there is no good quality frozen colostrum or artificial colostrum present, it is advisable to improve the first colostrum of insufficient quality with Turbo Colostrum before it is fed, see figure 1.

Figure 1: IgG content in colostrum. Source: Bielman et al.(2010), Journal of Dairy Sci.93:3713-3721

Immunoglobulins (IgG's) content in colostrum			
BRIX %	Colostrum IgG g/L	Minimum liter to reach 200 gram IgG*	Advice 1st feeding after birth**
19	12	16	***
20	24	8,3	***
21	35	5,7	4 L colostrum + 100 g Turbo Colostrum
22	47	4	4 L colostrum + 100 g Turbo Colostrum
23	58	3,5	4 L colostrum + 50 g Turbo Colostrum
24	70	3	4 L colostrum + 50 g Turbo Colostrum
25	82	2,5	3 L colostrum + 50 g Turbo Colostrum****
26	93	2,2	3 L colostrum****
27	105	2	3 L colostrum****
28	116	1,7	3 L colostrum****
29	128	1,6	3 L colostrum****
30	139	1,5	3 L colostrum****
31	151	1,5	3 L colostrum****
32	163	1,5	3 L colostrum****

■ Inadequate 
 ■ Reasonable 
 ■ Good 
 ■ Excellent

\* Minimum amount (L) that a calf theoretically has to drink to get 200 grams of IgG.

\*\* For a good start it is important that a calf receives 200 grams IgG in the 1st feeding after birth. Preferably within 1 hour after birth. Optimally the calf receives a total of 250 IgG within the first 6 hours after birth. Provide the calf the 1st and the 2nd feeding with as much colostrum as it wants to drink, maximum 4 liters per meal.

\*\*\* 1st colostrum with a Brix value <20 should preferably not be fed the first feeding after birth. It is advisable to replace the colostrum with good quality colostrum (Brix >21) or bovine dried colostrum. If there is no good quality colostrum or bovine dried colostrum available than we advise to add 200 grams Turbo Colostrum to the colostrum and feed it anyway.

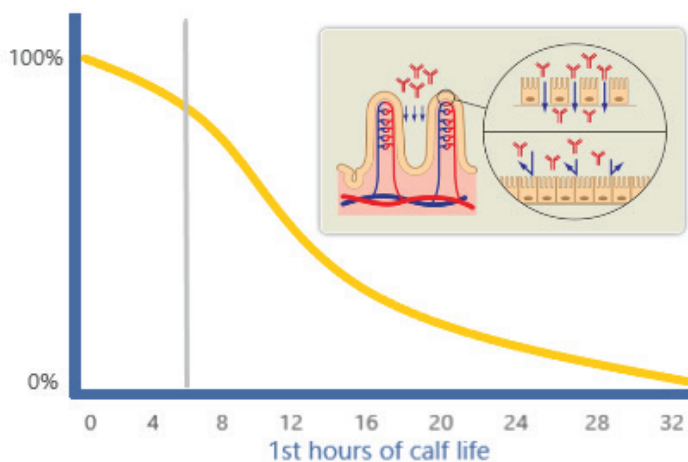
\*\*\*\* Make sure not to use too much good first quality colostrum, use as much as needed. If the stock is too low and the Brix value of first colostrum is > 25, it is advisable to limit the first feed to a maximum of 3 liters and to freeze the remaining liters.



**Schils**

Specialist in Young Animal Nutrition

Figure 2: Ability to absorb immunoglobulins from colostrum into the blood within the small intestine (pinocytosis). Source: Colostrum, a key to survival (Servet, M. Espada Aguirre, 2011)



Providing colostrum through a teat is the best method. The saliva production that is triggered by drinking from the teat stimulates the digestion, which promotes the intake of the immunoglobulins. If the calf itself does not drink enough the first time, or not at all, then tube feeding is an option. With tube feeding, 4 liters of good colostrum must always be entered. Keep in mind that the esophagus slot reflex with tube feeding does not work, meaning that 1 liter is lost because it ends up in the rumen (rumen has a capacity of approximately 1 liter in a newborn calf). Three liters of effective colostrum then remain and the calf will absorb the IgG from this in the small intestine.

### Why should a calf receive colostrum as soon as possible after birth?

As can be seen in Figure 2, the intestinal wall is not always able (open) to absorb immunoglobulins into the blood and to increase passive immunity. Immediately after birth, all immunoglobulins offered in the small intestine can be absorbed into the blood (pinocytosis). The intestinal wall begins to close 4 hours after birth. As previously explained, it is therefore best to offer 200 grams of immunoglobulins directly after birth and a total of 250 grams before the age of 6 hours. 24 hours after birth, the intestinal wall will only allow 10% of the immunoglobulins offered to the blood. In most calves, the intestinal wall is completely closed after 24 to 48 hours after birth. If the colostrum is contaminated, has a high total plate count, the intestinal wall will respond to this by closing even faster. It is therefore advised to offer calves a minimum of 1.5 days colostrum, optimally during the first 3 days of life. Longer implementation of colostrum has no longer an effect on the passive immunity of the calf. However, the immunoglobulins that are fed after closing of the intestinal wall, will have an effect on the intestinal level against any pathogens present. Problems and diseases in calves due to incorrect colostrum management are initially expressed in the first three weeks of life in the form of diarrhea. It is underestimated that when calves suffer from respiratory problems (BRD, Bovine Respiratory Disease) between week 5 - 16 this can also be related to colostrum management. A good passive immunity also means a better active immunity, see Figure 3. Calves that had diarrhea in the first weeks of life have an increased risk of respiratory problems. (Reindsen, H. Hoge Kalversterfte vraagt om aandacht, Nieuwe Oogst, 6 mei 2017)

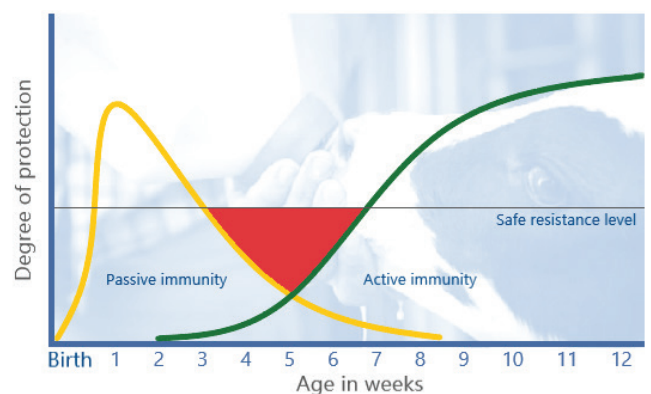


Figure 3: Passive and active immunity calf. Source: Dairy Calf & Heifer Association, 2011 Dr. Mike van Amburgh





# Schils

The blood can be tested to determine whether a calf has absorbed the correct amount of immunoglobulins in the blood. Calves that are between 5 and 10 days old can be examined best. If the level of IgG in the blood is too low, too little immunoglobulins were offered in the first 6 hours or the transfer to the blood did not go well: Failure of Passive Transfer (FPT). Calves with >10 grams of IgG per liter of blood have a greater chance of survival. Values of >15 grams per liter of blood are considered good. If the Brix and blood values are structurally too low and too many problems arise, it is necessary to optimize colostrum management. This includes calf and dry stock management, housing, vaccination of dry cows and the use of colostrum supplements.

### Colostrum supplements are not a replacement but an additive

Initially, supplements and bovine dried colostrum should only be seen as emergency solutions and an additive / supplement to the fresh colostrum from the own cows. In the absence of sufficiently good colostrum or colostrum of moderate quality, a colostrum supplement such as Turbo Colostrum can offer a solution. Turbo Colostrum contains a high amount of WPC (Whey Protein Concentrate), bovine dried colostrum, specific antibodies grown in egg protein (IgY) and important vitamins and minerals. The composition of the Turbo Colostrum supports the calf from birth and during the first weeks of life.

If there is no colostrum available Turbo Colostrum can be fed as the first feeding after birth. It is then recommended to dissolve 400 grams of Turbo Colostrum in 2 liters of water (40 °C).



### Benefits of using Turbo Colostrum

- IgY neutralize pathogens and prevent them from attaching to the intestinal wall
- IgY against E-Coli and Rotavirus
- Natural IgG for a broad approach against pathogens
- Supplement vitamins A, D, E and C
- Contributes to a lower antibiotic use
- Higher daily growth and higher weaning weight

When the colostrum of the cow is not good enough, our advice is to supplement the colostrum with Turbo Colostrum. 50 or 100 grams of Turbo Colostrum can be added once to the first colostrum if the Brix value is between 21 and 25 (see figure 1). Colostrum with a Brix value >26 does not need to be improved. In addition to the one time use of Turbo Colostrum it can also be used as a supplement to any diet in the first three to five days of life. It is then recommended to add 50 grams of Turbo Colostrum to each diet.



### Keep in mind

- Be extremely hygienic
- Content: immunoglobulins, energy, protein, vitamins and minerals
- Supports active immunity
- Quality = Brix value + total plate count
- Directly after birth 200 grams immunoglobulins
- Within 6 hours after birth 250 grams immunoglobulins
- Providing colostrum through a teat is the best method
- The intestinal wall closes 24-48 hours after birth
- Supplements and artificial colostrum are emergency solutions

**Today's calf is tomorrow's cow**

[www.schils.com](http://www.schils.com)

info@schils.com - +31 (0)46-45 99 900

EN\_S19.5