

# 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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### Contribution:

Dhr. A. Terpstra of PTC+ Oenkerk – Dairy Training Centre – made an important contribution to this supplement of the Veepro Magazine.

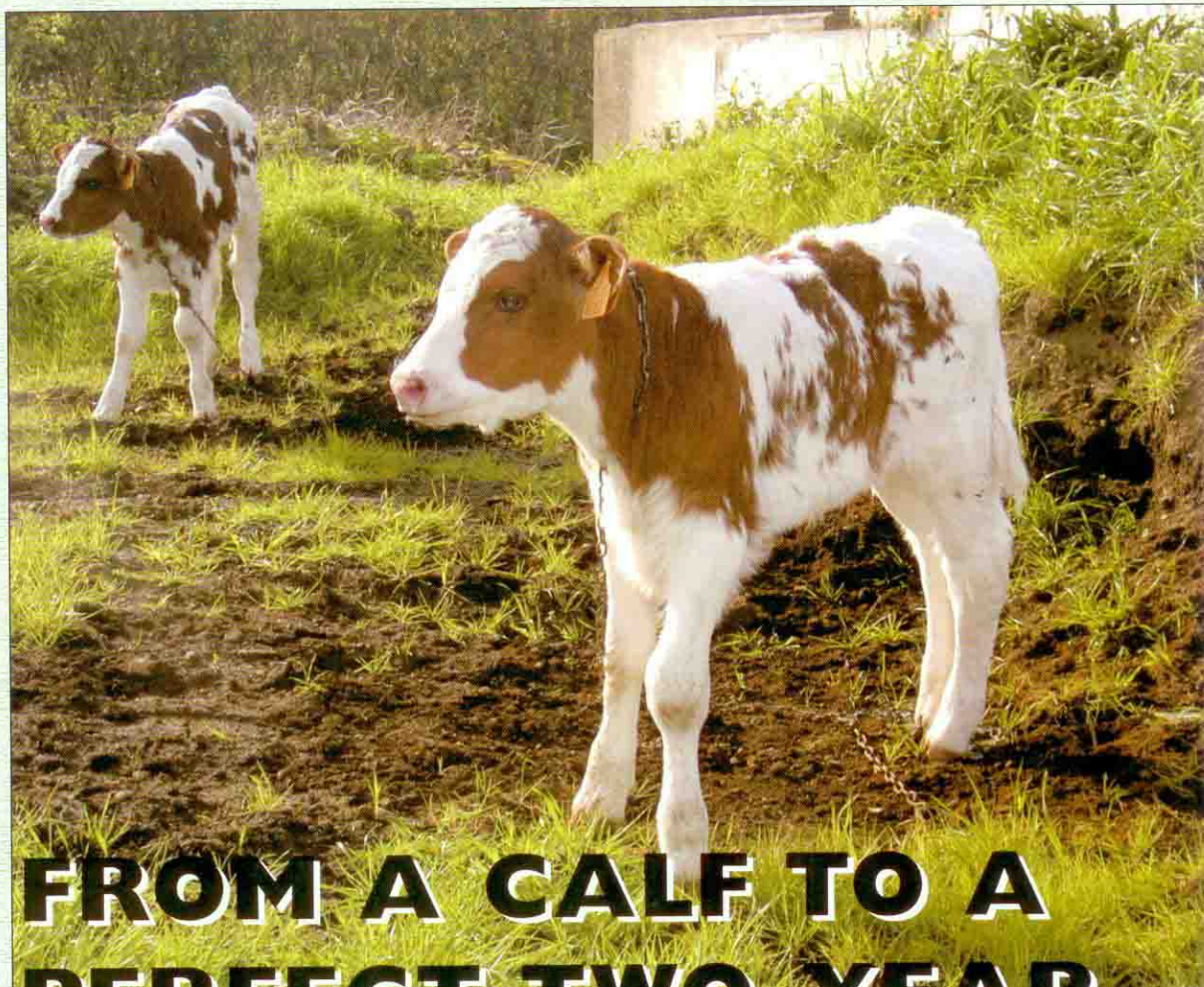
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## FROM A CALF TO A PERFECT TWO-YEAR-OLD MILKING COW

### Don't make any mistakes

Calf raising is critical. Not only is the colostrum period of great importance, but so is the entire raising period from a calf to a two-year-old. Everything during this period must be geared to proper care so that a newborn calf after approximately two years appears in the parlour as an appealing, high producing two-year-old.

The colostrum period, and certainly the milk period as well, play a crucial role in this. Actually a dairy farmer cannot afford to make any mistakes during this period. With regards to time, but also financially, the

dairy farmer has to invest in order to reach the goal - a perfect producing two-year-old.

There are two important periods: the colostrum period and immediately following that, the milk period. In the first days after birth, a good colostrum supply is extremely important. The colostrum period was discussed extensively in Veepro Magazine 46. During the milk period, other aspects require extra attention:

- feeding milk replacer or whole milk after the colostrum period
- prevention of diarrhea among the calves
- good water availability

*Calf rearing is the basis for a good milking cow*

- sufficient attention to rumen development
- weaning of the calves

### Choose milk replacer

After the colostrum period, which normally lasts three days, the question arises as to which milk product the calf should receive in the coming weeks. A dairy farmer can choose between whole milk and milk replacer. Each product must be considered according to its advantages and disadvantages. In most cases, raising calves on whole milk is simply too expensive. Milk replacer tends to be

Type	When	Symptoms	Cause	Details
Nutritional Diarrhea	Week 0-10	<ul style="list-style-type: none"> <li>• Thin manure</li> <li>• Drinks well</li> </ul>	<ul style="list-style-type: none"> <li>• Mixing</li> <li>• Temperature</li> <li>• Amount</li> <li>• Regularity</li> </ul>	Calves that drink the first colostrum of the cow, it occurs here often.
E-coli	Days 0-5	<ul style="list-style-type: none"> <li>• Quite sick</li> <li>• Drinks poorly</li> </ul>	<ul style="list-style-type: none"> <li>• Nutritional diarrhea</li> <li>• Hutch contamination</li> </ul>	Stop giving milk immediately.
Rota Virus	Days 2-16	<ul style="list-style-type: none"> <li>• Calf is not really sick.</li> <li>• Often calf drinks well.</li> </ul>	<ul style="list-style-type: none"> <li>• Contamination from cow to calf</li> <li>• Contamination from calf to calf</li> </ul>	Occurs on almost 80% of farms. Continue to feed milk, but spread out over the day. Add a small amount of colostrum to the milk to increase the immunity at the intestinal level.
Corona Virus	Days 2-16	<ul style="list-style-type: none"> <li>• Calf is a lot sicker than with rota virus</li> </ul>	<ul style="list-style-type: none"> <li>• Contamination from cow to calf</li> <li>• Contamination from calf to calf</li> </ul>	Continue to feed milk, but spread out over the day. Add a small amount of colostrum to the milk to increase the immunity at the intestinal level.
Cryptosporidia	Days 5-20	<ul style="list-style-type: none"> <li>• Slow</li> <li>• Drinks poorly</li> </ul>	<ul style="list-style-type: none"> <li>• Insufficient hygiene around calving</li> <li>• Insufficient colostrum provided</li> </ul>	

Table Diarrhea with calves;

more financially attractive than whole milk. Milk replacer not only has a financial advantage. There are also other advantages that support the case for milk replacer. A calf benefits greatly from a consistent composition of milk. With milk replacer, this composition is always constant; on the other hand, the composition of whole milk fluctuates. Whole milk may have a high fat content. This causes an earlier point of filling in the calf. In turn, this leads to a decrease in the intake of dry feed. It is also well-known that 'weaker' calves depress faster when they are fed whole milk. In addition, anemia occurs more often in calves that are raised on whole milk. This is caused by a Fe (iron) shortage.

#### Temperature

The temperature of the milk is also very important. With whole milk the temperature is always less than 37° C when the milk arrives at the calf. Milk replacer is prepared at a temperature of 40° C. This gives less risk of feed disturbances. Last of all, but surely not the least important argument in the choice for milk replacer is the issue of the transfer of diseases. The best known is Para Tuberculosis, which is generally referred to as Crohn's disease in people. The organisms of this disease may transfer via whole milk from cow to calf. In a severe case, a cow that is a latent carrier of Para TBC is able to infect an entire round of calves.

Milkreplacer is prepared at a temperature of 40°C



#### Deal with diarrhea quickly

A problem that every dairy farmer has to deal with almost every year is the fact that one or more calves have thin manure. This is frequently a form of diarrhea. On the dairy farm there is a distinction between:

- nutritional diarrhea
- infectious diarrhea

It is commonly known throughout the world that calf diarrhea appears in various forms. This already indicates how difficult it is to make a correct diagnosis at an early stage. Do not wait with treatment, or - even better - take measures to prevent diarrhea. A number of practical tips that can contribute to this are the following:

1. Ensure good hygiene throughout the calving process.
2. Ensure that the navel of the newborn calf is disinfected immediately.
3. Ensure that there is an optimum provision of colostrum.
4. Mix milk replacer in the proper way.
5. Feed milk replacer at the correct temperature.
6. Feed at regular intervals.
7. Prevent contamination between calves.
8. Ensure a dry, clean and draft-free bedding area.
9. After use, the pen should be power washed, disinfected, and allowed to dry.

#### Nutritional Diarrhea

Nutritional scours is a form of diarrhea which is often caused by the way in which the calves are fed, in most cases with milk. At the same time, feeding practices are also the solution. Problems can develop with the mixing of the milk replacer, the preparation temperature, the amount, the regularity, etc. At first sight, all of these practices are quite easy to correct, if necessary. The real problem however, is that initially it is difficult to determine whether it is a case of nutritional scours

or an infectious form of diarrhea.

When the latter is the case, a completely different treatment is required than with nutritional scours. That now is the real problem: "We often don't know what it is." Therefore, initially approach every diarrhea problem in the same manner:

- The most important thing is that the calf continues to receive sufficient fluid.
- The best solution is to provide an electrolyte mix to the calf at a minimum of twice per day. The time period (maximum of two days) that should be followed depends a little bit on how the calf responds to this.
- One who chooses an electrolyte mix must always supply this mix separately without adding milk.

#### Nutritional diarrhea;

Provide an electrolyte mix to the calf



#### Infectious diarrhea

In contrast with nutritional scours, infectious scours are caused by viruses or bacteria. In order to treat this type well and adequately, it is important to first deter-

mine which type of diarrhea (see table) is present on the farm. For this, a veterinarian's advice is necessary. With the assistance of manure or blood samples, he will often be able to determine what type of diarrhea is occurring. But also with this knowledge, it appears that it is not always easy to treat diarrhea. In the field it frequently happens that an "innocent" nutritional scours slowly develops into an e-coli diarrhea. And in order to treat this e-coli diarrhea well, a different and more rigorous approach is required than in the case of nutritional scours.

### Sufficient water supply

It is not sufficient to supply milk to the calf during the milk period only. It is not true that the milk that a calf receives provides all liquid needed. Both in the case of supplying milk replacer and whole milk, the calf also needs to have constant access to clean and fresh drinking water. Exact figures about the amount are hard to give. Research and literature studies indicate that during the milk period the water intake of a calf can vary from two litres during the first week to up to six litres during the week of weaning. Calves that receive milk from a pail with a nipple should not be able to drink water immediately after they have received milk. A waiting period of approximately two hours is necessary. In the meantime the milk can leave the abomasum. If the calf receives water too quickly, that water dilutes the milk in the abomasum. This can lead to feeding disturbances.

### Stimulate rumen development

At birth, a calf has four stomachs (reticulum, omasum, abomasum and rumen), but there is only one that is active, the abomasum. During the first few days, the digestive system of the calf functions in the same way as that of an animal with a single-stomached animal. At the time of birth the reticulum, omasum, and the rumen are not or barely developed when compared to the abomasum. In a newborn calf, the abomasum takes almost 60% of the total stomach volume, while in a mature cow this is reduced to only 8%. The opposite happens with the rumen, which begins with 25% in the newborn calf, but develops to 80% in a mature cow.

### Provide concentrates and forage

For a ruminant, in this case the newborn calf, it is important to stimulate the development of the rumen as soon as possible. Remember, it is the goal to have a milking two-year-old that produces well and efficiently in two years. In order to make this possible, there needs to be sufficient rumen development and especially also rumen activity.

When the calves receive too much milk for too long, less rumen development will take place. This happens because the milk

## THE EFFECT OF VARIOUS RAISING SYSTEMS ON RUMEN DEVELOPMENT AND RUMEN WEIGHT

	WEIGHT OF THE RUMEN	VOLUME OF THE RUMEN
FIRST DAY	20 grams	1.5 litres
AFTER 13 WEEKS raised with only milk	78 grams	7.3 litres
AFTER 13 WEEKS raised with milk and hay	195 grams	37 litres
AFTER 13 WEEKS raised with milk and calf starter	356 grams	30 litres

SOURCE: Provimi. (Weight and volume of dried calf rumen)

ends up in the abomasum and not the rumen. In order to stimulate the rumen of the young calf, a supply of proper feed is necessary, specifically concentrates and forage. Both have two effects on the development of the rumen. In the first place, the rumen grows because of the forage and/or concentrates. But also, the rumen wall begins to develop, especially due to the growth of the rumen papillae. These rumen papillae ensure that the rumen can absorb the nutrients well. This is imminently important. When the rumen papillae are insufficiently developed they may have an influence on the cow's capacity to digest later on. During the digestion of feed, acids are released. The most important three are propionate, butyrate, and acetate. Butyrate is known to contain the building blocks for the development of rumen papillae. Butyrate comes available in the digestive processes in the rumen.



*Add a special concentrate with corn like wheat, barley, maize, protein ( crudeprotein percentage of 18-19%) and a bit of molasses for a good taste. Better is to expand the corn in order to increase the digestibility*

650 grams of growth per day

Do as much as possible to optimize the early growth of a calf. In fact, a calf has to grow as if it were being kept for meat production. This growth is easily achieved when the rumen is well developed, or more specifically, the rumen papillae are well developed. In practice, this means that during the first two months, the calf has to grow by approximately 650 grams

per day. Fattening does not occur when a steady growth schedule is followed. Fattening often occurs when a forced catching up has to be made. For example, extra feeding after a disease. In calves that only receive milk and forage, for example hay, the development of the rumen and the rumen papillae is very limited (see table).

### Muesli

High quality concentrates are very important for a young calf, but not every type of concentrate is good. Starches and sugars in the concentrate ensure the production of butyrate. Especially starch from cereals contributes to the formation of sufficient butyrate for the stimulation of the rumen wall. For an optimum development of rumen papillae, feeding of some type of muesli, also known as calf starter, is the best for calves. An advantage of the muesli is that once it has arrived in the rumen, it works as a kind of brush over the rumen papillae. This has a stimulating effect. Concentrates in the form of a pellet have the disadvantage of becoming wet and mushy in the rumen of young calves. This can lead to rumen papillae clinging together. Of course, this has a negative effect on further development. It is better not to use a concentrate that is intended for milking cows. Often this contains quite a lot of fat, which the young calf is unable to use. A calf needs easily digestible concentrates, preferably concentrates that have a crude protein percentage of 18-19%.

### Weaning between weeks 8 and 10

When the calves are between 8 and 10 weeks old, they are often ready to be weaned. In most cases, a longer milk period will only lead to more rapid fattening and a lower intake of forage and concentrates. At the time of weaning, milk is taken away as an important energy and

**Table** correlation of chest circumference to weight

Chest Circumference in cm	Weight in kg
75	41
80	49
85	58
90	68
95	79
100	91
105	104

