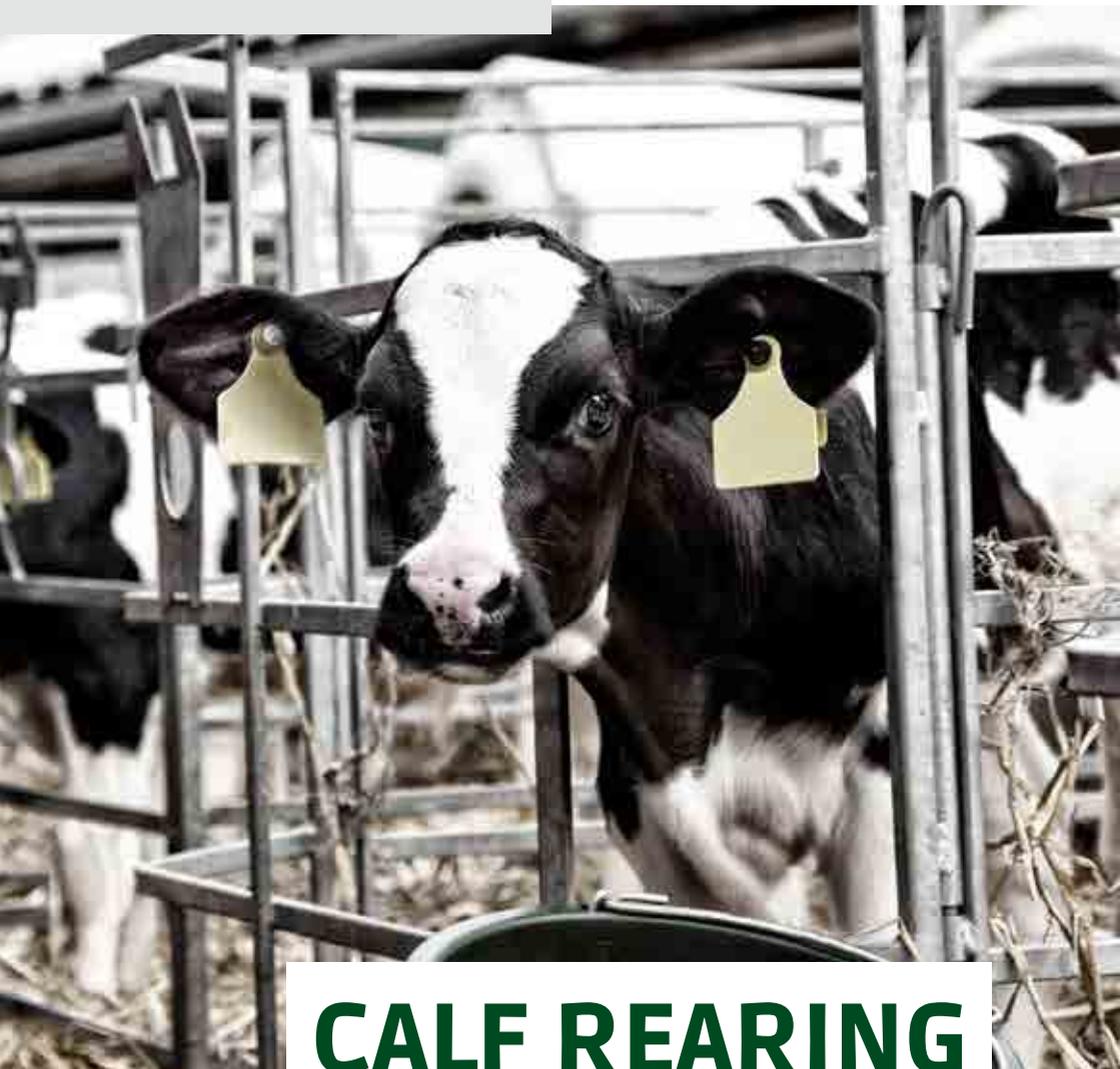




BEWITAL agri
specialist in milk & fat



CALF REARING

Basics and recommendations for a successful rearing.



“Today’s calves are the future of dairy farms.”

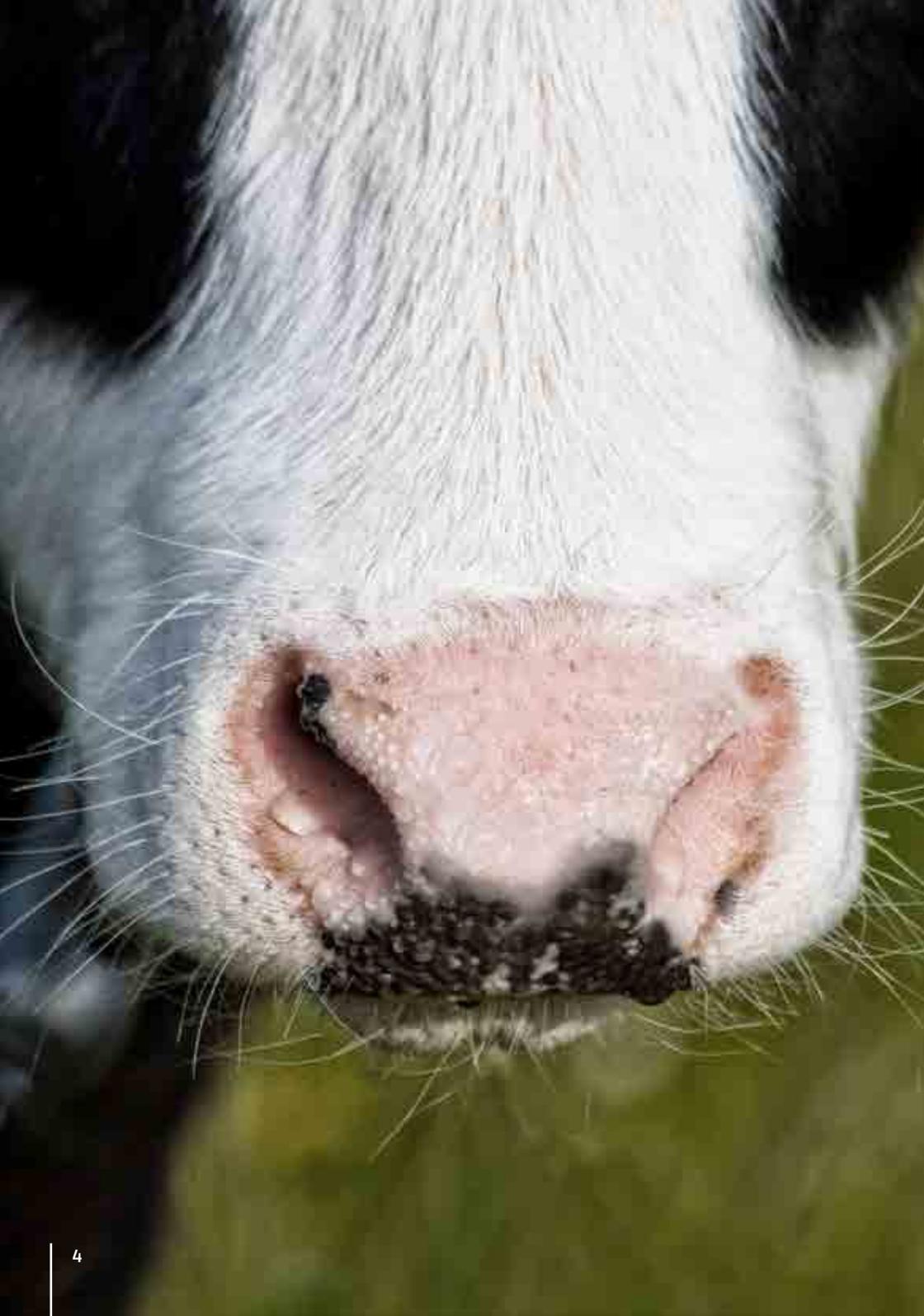
Introduction

Economically successful dairy farms attach great importance to high milk yields and a long productive life for dairy cows. To achieve this, the health and development of the calf during the feeding phase is very important. The rearing of the future dairy cow starts with the colostrum supply of the newborn calf and continues with optimal feeding in the drinking phase. Well-fed calves not only show high daily weight gains during the first weeks of life, but also optimal organ development, a healthy gut microbiome and good immunity. Optimum rearing lays the foundation for the performance and productive life of the later dairy cows. Calf rearing is therefore not an end in itself, but a means to achieving the goal of healthy and productive dairy cows.

Dr Michael Hovenjürgen, responsible for research and development at BEWITAL agri GmbH & Co. KG, is of the opinion: “Today’s calves are the future of dairy farms. Only healthy, optimally fed calves can later produce high milk yields for a long productive life of the dairy cows.”



Dr Michael Hovenjürgen
Research and development
BEWITAL agri GmbH & Co. KG



Content

1. Basics

1.1 Main factors influencing the calf	6
1.2 Colostrum	7-9
1.3 Whole milk feeding and supply of iron	10
1.4 The influence of the ambient temperature.....	11
1.5 Metabolic imprinting	12-15
1.6 High weight gains as a calf are the basis for high milk yields as a cow ..	16
1.7 The weaning phase – an important time	17

2. Animal health begins in the gut

2.1 The sonner, the better.....	18
2.2 Our BEWITAL-Vitality-System (BVS 2.0)	19
2.3 Our calf concept to promote gut health.....	20-21

3. Our BEWI-MILK® assortment

BEWI-MILK® special calf milk replacer.....	23
BEWI-MILK® milk replacer with skimmed milk powder	24-26
BEWI-MILK® milk replacer without skimmed milk powder	27

4. Challenges and problems

Only healthy calves can grow continuously without any problems	28-30
Calves that fall ill during rearing are often not fit later as dairy cows	31

5. BEWI-SAN - solutions for successful calf rearing

5.1 The first hours of life are crucial	34-35
5.2 Safe rearing even under difficult conditions	36-37
5.3 Whole milk alone is not enough	38-39
5.4 Increased fluid requirements	40-41
5.5 Diarrhoea is main cause of losses in calf rearing	42-43
5.6 Stabilisation of growth performance	44-45
5.7 Encouraging calves to eat early on.....	46-47

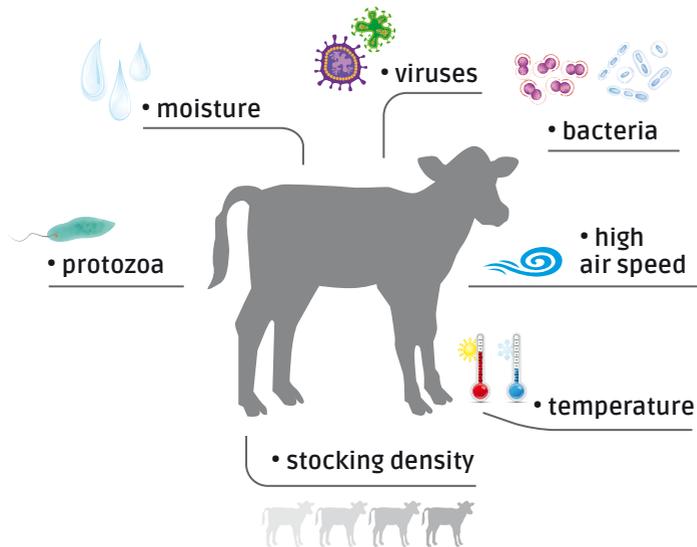
6. Annex

The optimal rearing intensity	48
Milk feeding concentration	49
Milk feeding schedule for intensive rearing	50

1 | Basics



1.1 Common problems in calf rearing

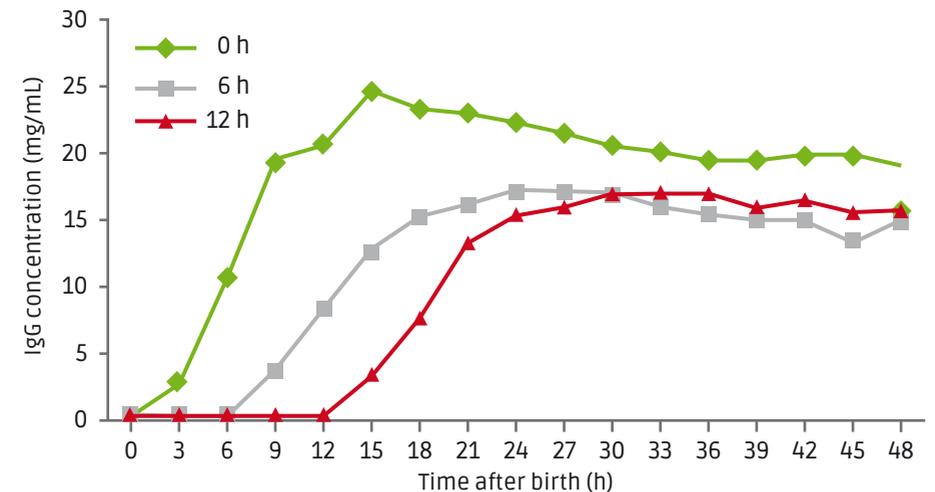


It is important to consider that calves are under permanent pressure from different external factors. These include beside pathogens like viruses, bacteria and protozoa, also the temperature, moisture, high air speed and stocking density.

1.2 Colostrum

Fischer et al. 2018 were able to demonstrate impressively the influence of the timing of the initial colostrum supply on the imprinting and development of the immune system. Prompt provision of colostrum led to a rapid increase in IgG concentration in the blood, thereby inducing rapid immunity in the calves' blood.

If colostrum is provided later (6 or even 12 hours later), the IgG concentration in the blood rises slowly and with a delay. The critical immunological phase lasts longer and the calves become more susceptible to disease.

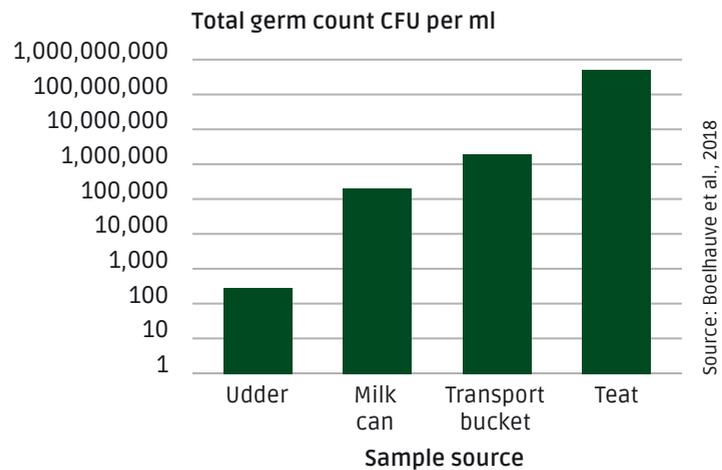


Influence of the timing of colostrum supply on the IgG concentration in the blood serum of calves (Fischer et al. 2018)

Calves do not receive immunoglobulins from the cow's uterus in the womb. Immediately after birth, the calf's immunity is based solely on the supply of colostrum in the first few hours of life.

Colostrum is usually milked into a jug. Studies show that even very good colostrum can be heavily contaminated with pathogens in the jug. This can increase by the time it reaches the teat.

Almost 70 % of colostrum samples showed coliform contamination by the time it reached the teat (Boelhaue et al. 2018).



In many cases, intestinal gut walls are already occupied by pathogens **BEFORE** colostrum enters the gut → intestinal barriers are partly blocked!

- Calves are often exposed to pathogens already in the calving area
- Colostrum contaminated with pathogens:
 - Same can for fresh cows as for cows with udder inflammations?
 - Can, bucket and teat cleaned after each milking/feeding?

If the supply of immunoglobulins is inadequate, problems such as immunodeficiency, total losses, poor growth rates and high treatment costs are inevitable. It is almost impossible to make up for the deficiencies of the first hours of life!

The four golden rules of colostrum feeding:



Speed: Calves should receive colostrum as soon as possible after birth.



Quantity: Calves should receive as much colostrum as they consume, at least four litres in the first two hours of life.



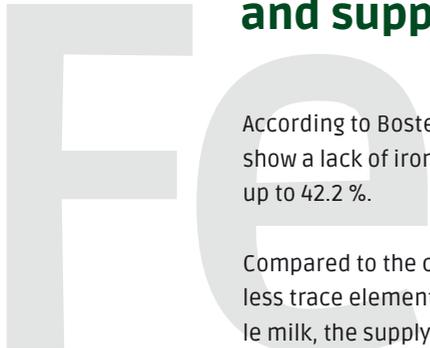
Quality: The immunoglobulin content should ideally be >50g/L or supported by a colostrum booster (**BEWI-SAN Calf Start**).



Cleanliness: Clean, hygienically collected colostrum without contamination with germs and pathogens.

Calves fed colostrum contaminated with germs are more likely to contract lung and diarrhoeal infections. The optimal supply of perfect colostrum has an effect on the health stability and survival rate of the calves and continues to have an effect on the cow calves into later lactation.

1.3 Whole milk feeding and supply of iron



According to Bostedt et al. (1990) 18.8 % of all naturally born calves show a lack of iron. In case of extended birth this value increases up to 42.2 %.

Compared to the calf's nutritional demand, whole milk contains less trace elements, especially iron. If calves are only fed whole milk, the supply of iron is insufficient. Iron is not only an essential component for the formation of the blood element haemoglobin, but is also producing antibodies which fight against infections. Anaemia, lower daily weight gains and a weak immune system are among the most significant consequences of iron deficiency.

In case of whole milk feeding:
BEWI-SAN
Milk+

- Take care about an adequate supply of iron, particular in case of whole milk feeding.
- The current recommendation is up to 100 mg iron per animal per day and is ensured by application of milk replacer.

Comparison of an additional iron supply by 10 or rather 50 mg iron/kg milk replacer (Gygay et al., 1993)

Iron per kg milk replacer	10 mg	50 mg
Iron content in the blood	15 µmol/L	15 µmol/L
Iron content in the blood 13th week of life	4 µmol/L	15-20 µmol/L
Rectal temperature > 39.5 °C	88 x	30 x
Antibiotic treatments	44 x	16 x
Heart- and respiratory rate	increased	
Daily weight gains		+ 160 g

1.4 The influence of the ambient temperature

The thermoneutral zone of the calf varies between 15 and 25 °C in the first three weeks of life. In this zone the calf does not need any additionally energy to keep the body temperature at a constant level. During the cold season, the calf's energy requirement increases significantly for heat generation. If the higher energy requirement cannot be achieved through more milk feeding, less energy will be available for growing.



- The energy requirement of the calf increases already up to about 35 % at temperature of -5 °C.
- With 'controlled replete' feeding, calves will consume more milk on their own in winter. With restrictive feeding, the amount or concentration of MAT should be increased.

Calves need more milk replacer with falling temperatures (Kunz, 2009)

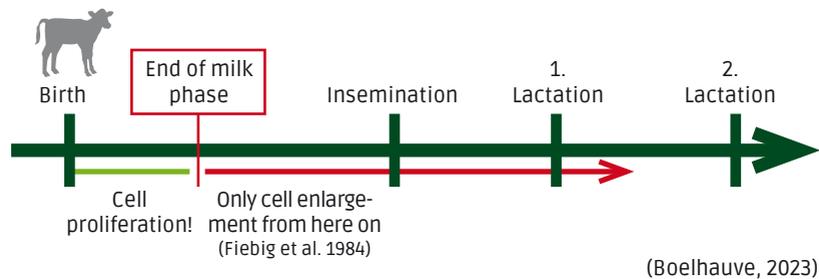
Ambient temperature (° C)	Additional amount of milk replacer per day (g powder)
20	0
15	65
10	130
5	200
0	265
-5	330
-10	400
-15	465
-20	530

1.5 Metabolic imprinting

Recent studies show that the nutritional status of the calf in the first weeks of life has a strong influence on its later performance. Even in the first few weeks of life, the calf's metabolism is characterised by high metabolic performance such as feed intake, growth and later milk yield. This process is often referred to as 'metabolic imprinting'.

The development of the udder and other organs also takes place in the first weeks of life. The calf needs adequate amounts of energy and nutrients for optimal development of all organs (Hammon et al. 2020).

Many studies have shown that intensive rearing results in improved young animal constitution and higher performance in the first lactation (Korst et al., 2017).

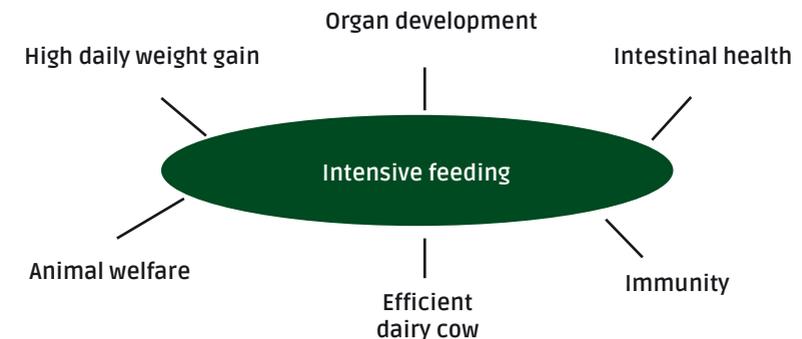


An animal's metabolic capacity is primarily determined in the first few weeks of life. The more cells there are during this time, the better they can cope with the demands of later life. This effect lasts a lifetime and cannot be corrected.



Intensive feeding during milk phase influences everything!

- **High daily weight gain:** An adequate supply of energy and protein is necessary for high daily weight gain
- **Animal welfare:** Ad libitum feeding and 'controlled replete' are important factors in animal welfare
- **Organ development:** Optimal nutrition from the start ensures the best possible development of all organs and functional tissues
- **Intestinal health:** Intensive milk feeding promotes the development of the intestinal mucosa and the intestinal barrier
- **Immunity:** Optimal nutrition supports the intestinal immune system and the development of a healthy intestinal microbiome
- **Efficient dairy cow:** Feeding the calf during the lactation phase ensures health, longevity, efficiency and lifetime performance as a future dairy cow



Energy and crude protein needs

Worldwide interest and research in early calf nutrition has been increasing in the last 2 decades. Early studies have shown that calves fed ad libitum ingest about 20% of body weight per day and can achieve daily weight gains of more than 1 kg.

Current recommendations take this into account and are based on two parameters – the amount of energy (metabolisable energy) to achieve body weight gain (“energy-allowable gains”) and – the amount of protein (protein to energy ratio) to achieve lean tissue growth and organ development and to prevent the calves from becoming too fat.

Recommendation for energy and protein supply (per day) (LfL, 2021 adapted)

Body weight (kg)	Age in weeks	Actual daily weight gain (g)	Energy ME, MJ	Crude protein, g	g XP/MJ ME
Mean daily weight gain 750 g/day:					
50-69	1-4	680	18	230	12.8
69-90	5-8	760	23	280	12.2
90-113	9-12	830	29	340	11.7
Mean daily weight gain 930 g/day:					
50-73	1-4	840	21	270	12.9
73-99	5-8	930	28	340	12.1
99-128	9-12	1010	35	420	12.0
Mean daily weight gain 1100 g/day:					
50-78	1-4	1000	24	320	13.3
78-109	5-8	1100	32	400	12.5
109-142	9-12	1190	41	490	12.0

The optimum composition of a milk replacer for growth, performance and health

In the first few weeks of life, the milk feed is the only source of nutrients for the young calf. The energy content of the milk feed is the limiting factor. A high fat content (>20%) has not proven to be useful in trials. Milk drinks with a high fat content were only voluntarily consumed by the calves in smaller quantities than milk replacers with a fat content in the powder of 17-19% fat (Wilms et al. 2022). The calves regulated their own fat intake.

To cover the energy requirement with an energy content of 17-18 MJ ME/kg, at least 1 kg of milk replacer powder per day is therefore necessary. For very high daily weight gains, the quantity should be increased to 1.3 kg to 1.5 kg powder per day.

The recommendations for protein supply result in a protein-energy ratio of 12.8-12.9 g protein per MJ ME for high daily gains, rising to 13.3 g protein per MJ ME for very high daily gains in the first weeks of life. To provide the best possible protein supply for optimal muscle and organ growth, this results in a target protein content in the milk replacer of 22-23% protein for high daily gains.

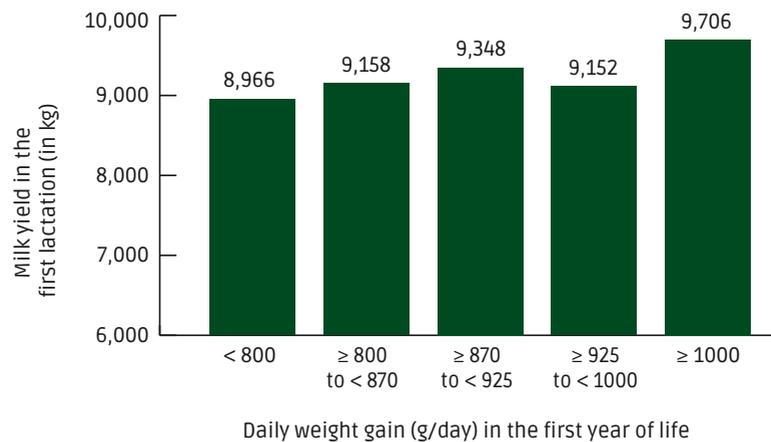
For very high daily weight gains of over 1000 g/day in the milk phase, the milk replacer should contain 24-25% protein.

The protein quality of the milk replacer is of great importance. Milk replacers with a very high proportion of skimmed milk powder or without vegetable protein are highlighted as advantageous (DLG, 2011).

1.6 High weight gains as a calf are the basis for high milk yields as a cow

A longer-term analysis of 2252 female calves on a dairy farm in Mecklenburg-Western Pomerania (Volkman et al. 2019) clearly showed the influence of calf development in the first year of life on milk yield in the first lactation.

Calves with a daily gain of more than 1000 g/day had the highest average milk yield of 9700 kg in the first lactation.



1.7 The weaning phase – an important time

Not all calves take up solid feed as early as possible. It is often necessary to support this by reducing the amount of offered milk.

The weaning phase forms an important point in calf's life during transition period to ruminants and has to be planned in detail. Excessive amounts of milk and too long drinking periods have negative effects on the rumen development. Even a too early weaning at the age of six weeks has a negative effect because of a smooth changeover to solid feed is not possible in this case. This results in growth interruption. Nowadays, a feeding period of ten weeks is usually recommended. Therefore, the reduction of milk feeding should take place over a period of, at least, three weeks.

Intake of concentrated feed by female calves at the automatic feeder during a drinking period of ten weeks (LVA Futterkamp, 2008)

kg concentrated feed per animal and day



2 | Animal health begins in the gut



2.1 The sooner, the better

Only a healthy intestine can optimally absorb and digest nutrients.

70 to 80 percent of an animal's immune system is located in the gut? So the gut plays a key role in health and performance. Therefore, our primary goal should be to promote healthy intestinal development as early as possible and to maintain it afterwards.

When building up a healthy intestinal flora, it is important to start as early as possible. This means already in the first days of the animal's life or optimally already before birth via the mother's diet.

That is why we focus on natural feeding concepts that can help to develop the intestinal health of your animals as early as possible and maintain it in the long term.

2.2 Our BEWITAL-Vitality-System (BVS 2.0)

Our BEWITAL-Vitality-System (BVS 2.0) is constantly being developed to optimise calf rearing and support animal health right from the start, based on the latest findings from animal nutrition research and extensive practical studies on farms.



- ★ **Sweeteners and flavours:**
For an optimal acceptance and feed intake
- ★ **Organic acids:**
For regulation of pH-value in the intestine and to optimize the living conditions of the intestinal flora
- ★ **Special fat formulation:**
Optimal size of particles, optimized for highest digestibility and utilization
- ★ **Probiotics:**
Living microorganisms, repress pathogenic germs
- ★ **Prebiotics:**
Promote the growth of positive intestinal bacteria

2.3 Our calf concept to promote intestinal health

Intestinal health is a crucial factor for well-being and performance. The intestines of newborn calves are still developing and are therefore more susceptible to disorders.

It is important to support the intestinal health of the calf as best as possible from the beginning. Adapted feeding is of great importance in this context.

With our **BEWI-SAN** products you can positively influence the intestinal microbiome and the intestinal barrier from the first day of life. For this purpose, we recommend a high-quality calf milk (e.g. **BEWI-MILK® AM 9**). Our calf milk contains with our **BEWITAL-Vitality-System** (BVS 2.0) all the important safety components for a healthy intestine.



colostrum supplement

infectious diarrhea

whole milk supplement



calf milk

gutit!
ANIMAL HEALTH
BEGINS IN THE GUT



BEWI-SAN & BEWI-MILK®

Day 1

Weaning

3 | BEWI-MILK® standard assortment

We are offering our milk replacer assortment **BEWI-MILK®** to supply calves optimally in the first weeks of life and to reach their full growth potential. It is based on latest scientific knowledge and actual feeding instructions.

Following aspects feature our range:

- Adjusted to different practical requirements we offer suitable products for every feeding situation.
- Problem free feed intake (important for young calves).
- Also ideal for 'ad-libitum' feeding and 'controlled replete' feeding.
- BEWITAL-Vitality-System (BVS 2.0) for optimal growth.



3.1 Special calf milk replacer with skimmed milk powder

BEWI-MILK® Protect Maximum safety and growth

Intensive rearing in the first weeks of life is only possible with a healthy calf. To achieve this, the basis must be right.

BEWI-MILK® Protect has been specially developed to support health, resistance and physiological digestion in the first weeks of life.



- High quality milk replacer for the start phase
- Supports the immune system with an optimised additive package
- Aroma and appetite stimulants increase feed intake
- Suitable for automatic feeders



60% skim milk powder
22,5% crude protein
18% crude fat

3.2 Calf milk replacer with skimmed milk powder

BEWI-MILK® AM 5

For very high daily weight gains in the milk phase

The growth potential of the calves is more than 1000 g gain per day. For optimal organ growth, the high protein requirement in this phase must also be covered by the milk feed.

BEWI-MILK® AM 5 is optimised for a high protein content from milk protein for very high daily weight gains.



- Milk replacer with 55% of skim milk powder
- For best growth and highest daily weight gain
- High protein content meets the calves' needs from the start
- Suitable for automatic feeders



55% skim milk powder
25% crude protein
17% crude fat

BEWI-MILK® AM 9

Proven for intensive rearing

The growth potential of young calves should be optimally utilised during rearing. To achieve this, the milk replacer feed must be optimised to meet the animals' needs.

BEWI-MILK® AM 9 is optimised for intensive rearing according to the latest scientific findings.



- Milk replacer with milk protein
- For best growth and highest daily weight gain
- Ideally suited from the first week of life
- Suitable for automatic feeders



50% skim milk powder
22% crude protein
18% crude fat

3.3 Calf milk replacer without skimmed milk powder

AM 18 For performance-oriented calf rearing



- Excellent quality, high levels of skim milk powder
- Ideally suited from first week of life
- High vitamin supplementation provides additional safety
- Suitable for automatic feeders



35 % skim milk powder
21 % crude protein
17 % crude fat

AZ 9 contains whey protein for a high safety level



- High natural content of albumin and globulin
- Ideally suited from the first week of life
- Supports rumen development
- Suitable for automatic feeders



22 % crude protein
18 % crude fat

AM 36 Allround product for calf rearing



- Milk replacer with skim milk powder
- Optimal for one phase feeding
- High daily weight gains
- Suitable for automatic feeders



20 % skim milk powder
21 % crude protein
17 % crude fat

AZ 18 Powerful during whole rearing



- Optimal protein-combination with highly digestible milk-protein
- Additional safety due to combination of two probiotic-systems
- Excellent digestibility for best daily weight gains
- Suitable for automatic feeders



21 % crude protein
17 % crude fat

4 | Challenges and problems

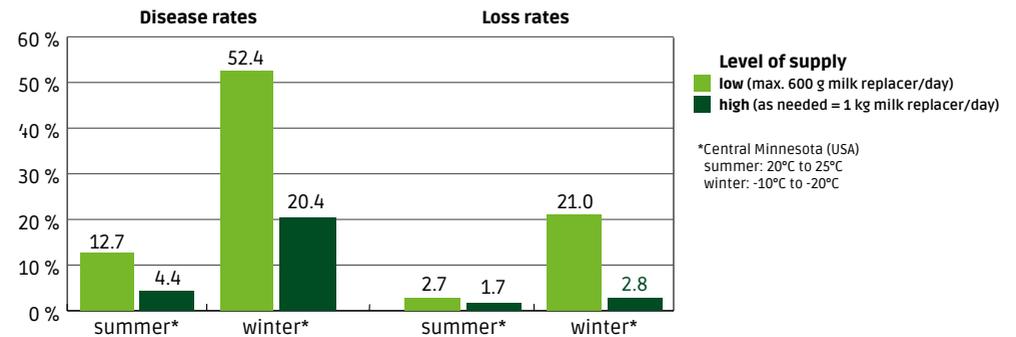


4.1 Only healthy calves can continuously grow without any problems

In dairy cattle farming the aim is to achieve an average age of first calving between 24 and 27 months. This is based on an intensive rearing of calves and young heifers.

In calf rearing average daily weight gains should be of at least 800 g during the whole drinking period. This is the only way to exploit the calf's full developmental potential as well as realizing an early age at first calving of the heifer. However, if health problems occur you must be prepared for performance depression and less daily weight gains.

In addition to the level of nutrition, the time of year also plays a key role in calf health. The outside temperature and the associated energy requirements for thermoregulation are particularly important. In the cold season, the risk of health problems and therefore the risk of losses increases significantly.



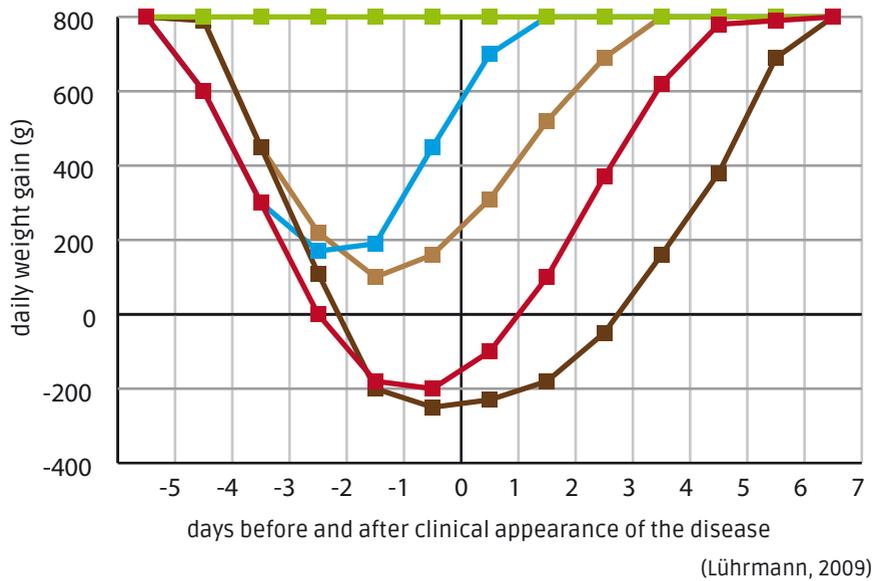
Supply levels and disease rates depend on the season (Godden et al. 2005)

Not only the outside temperature, but also wind speed and humidity affect the health and resilience of calves. It is a challenge to prevent calves from cooling down while at the same time providing sufficient fresh air without draughts.

Feeding on demand and providing all essential nutrients are essential for keeping calves healthy.

Each impairment puts a pressure on the calf's metabolism and consumes energy that is no longer available for daily weight gains. The figure shows the typical characteristics of daily weight gain at the time of the health problems. Even after mild diarrhoea the sick calf weighs 3.2 kg less than a healthy one. This has to be compensated by a longer rearing period.

Daily weight gains in the course of a disease (g per day)

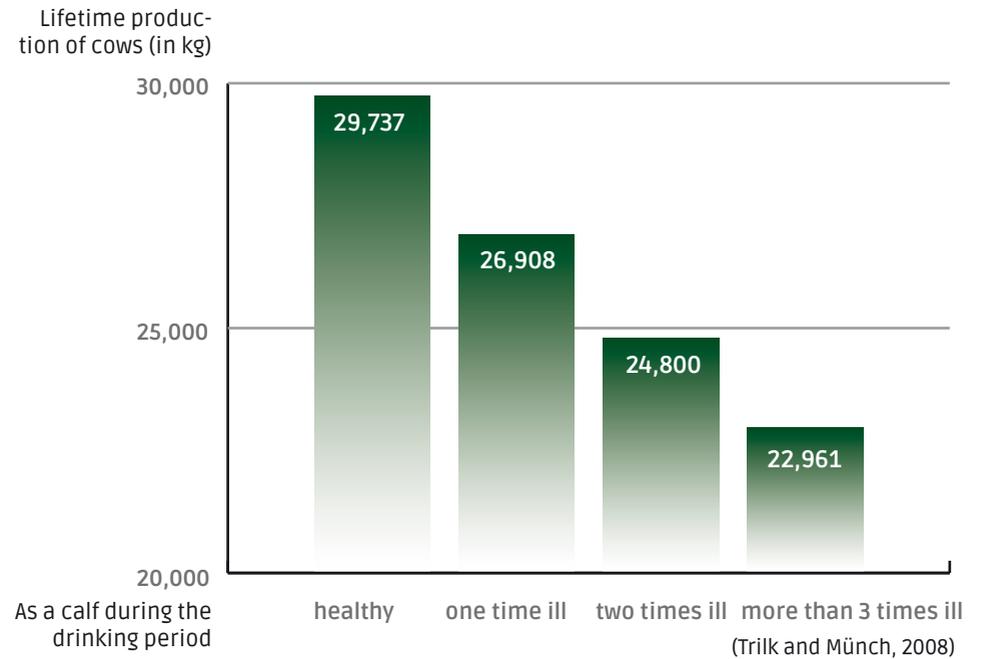


- healthy calf
- severe respiratory infection
- severe diarrhoea
- mild diarrhoea
- mild respiratory infection

• Only healthy calves are able to achieve high daily weight gains. Each health problem decreases growth.

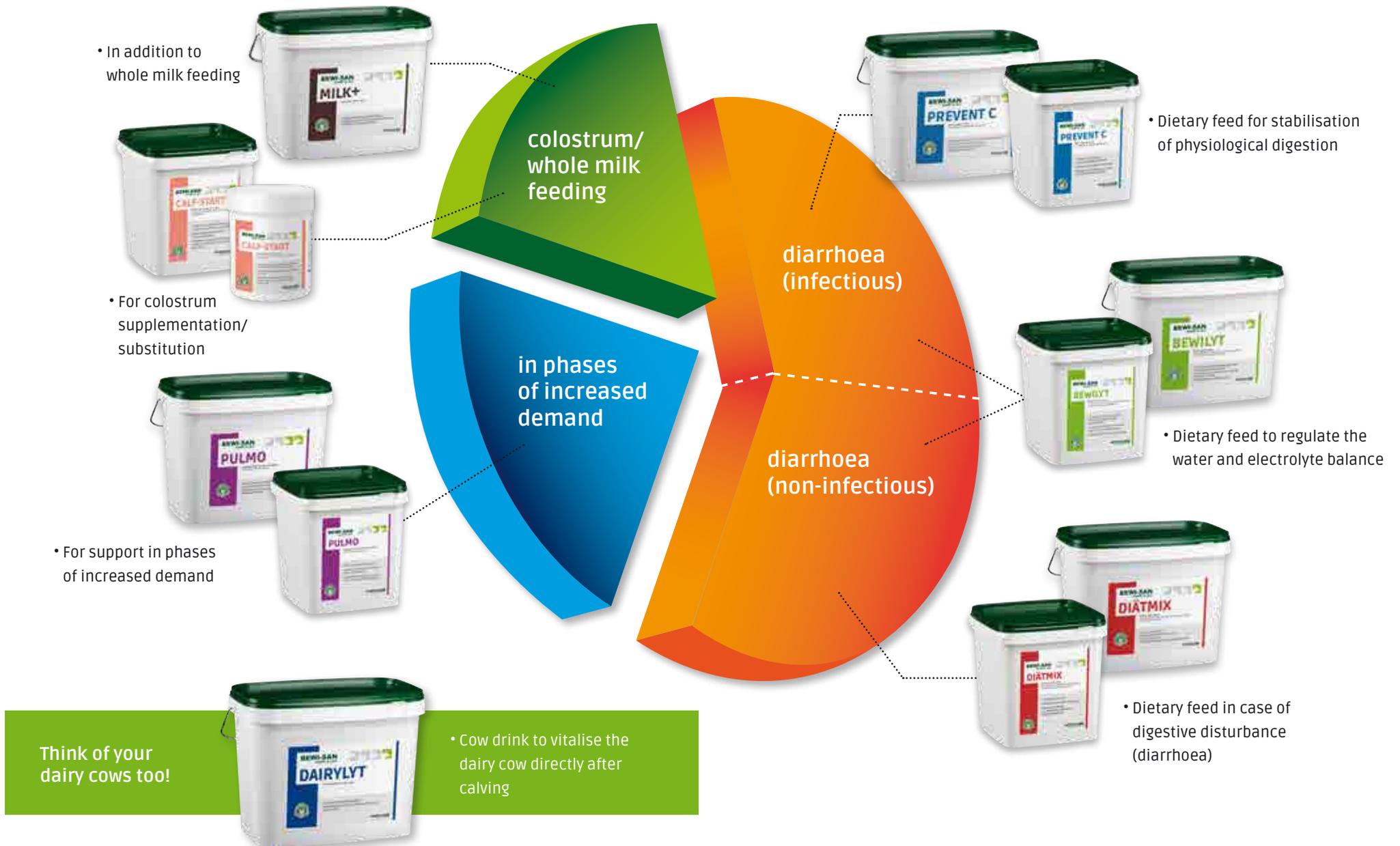
4.2 Calves becoming ill during rearing are often not healthy as a dairy cow.

A study in Brandenburg (Germany) showed that more than half of the animals which had multiple illnesses as young calves did not make it to their second lactation. Dairy cows without any problems during rearing have a significantly longer life and a 30 % higher lifetime production compared to others. Only healthy calves will become economic and profitable dairy cows.



• Only healthy calves develop themselves to economic dairy cows and form the basis for successful dairy farming.

5 | BEWI-SAN – problem solvers for calf rearing



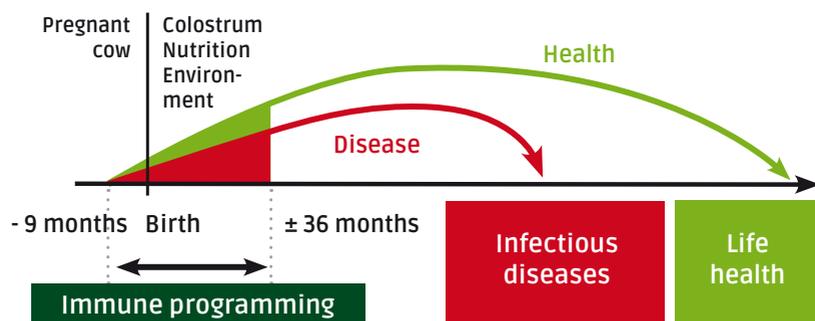
5.1 The first hours of life are crucial

Calves do not obtain any immunoglobulins from the cow's uterus. Directly after birth the calf's immunity is based only on the supply of colostrum. This is why a sufficient but also fast supply of colostrum is required.

In case of an insufficient supply of immunoglobulins, there are problems such as high mortality, total losses, poor weight gains but also high costs of treatment pre-programmed. Deficiencies in the first hours of living are difficult to compensate in future.

In certain situations, colostrum supplement or replacement is particularly recommended. For example in the case of purchased animals, heifers, sick mother animals (e.g. udder problems), lack of colostrum or also when the mother animal dies.

Influence of colostrum supply on the lifelong immune balance (according to Schubert, 2015)



BEWI-SAN Calf-Start To supplement/replace colostrum

- ✓ High-quality nutrition for calves right from the beginning
- ✓ With lactic acid bacteria to promote healthy intestinal flora in newborn calves
- ✓ With colostrum powder from first milking cows (IBR-free) and special egg powder
- ✓ With beta-carotene and all important vitamins to support the immune system in the first weeks of life



Application:

- As a colostrum substitute: Dissolve 400 g **BEWI-SAN Calf-Start** in 2 litres of warm water (40 °C), if possible offer immediately after birth (within the first hours); repeat as a 2nd meal after 6-8 hours
- As a colostrum upgrading: Stir 100-150 g **BEWI-SAN Calf-Start** per calf into the first colostrum feed

Packaging:



800 g can



3 kg bucket

5.2 Safe rearing even under difficult conditions

Newborn calves are particularly susceptible because their active immunity is not yet fully developed. Digestive disorders in the first two weeks of life are a significant problem for many farms. They can have many causes, such as high calving and housing densities in the calf barns or fluctuating temperatures. If a farm is affected, even the best colostrum management and strictest hygiene measures alone usually do not help.

Stabilising the physiological digestion of the newborn calf in the first few weeks of life is important for a successful rearing and good weight gain rates right from the start.

BEWI-SAN Prevent C In case of calf diarrhoea

- ✓ With carob pods meal, has a supportive effect on unspecific digestive problems due to the high proportion of swellable fiber
- ✓ Special formulation with organic acids supports digestion and stabilises the colostrum for at least 12 hours
- ✓ Lactic acid bacteria protect the intestinal mucosa and promote the natural intestinal flora
- ✓ Essential vitamins and trace elements prevents signs and symptoms of deficiency
- ✓ With appetising fenugreek



Application:

To stabilise physiological digestion if there is a risk of digestive disorders in the first 14 days of life.

Add 10 g/litre to the drink from the second meal in the first 8-14 days of the calf's life (at least 60 g per calf per day).

Packaging:



3 kg bucket



10 kg bucket



25 kg bag

5.3 Whole milk alone is not enough

Why should you add whole milk?

There is always a risk for dairy farms that feed their calves with whole milk. Feeding calves whole milk alone is often not enough. Although feeding whole milk initially appears to be a natural method, the composition and quantity has changed so much through breeding that it no longer fulfils the calves' original needs. Vital vitamins, minerals and trace elements are insufficiently available in whole milk.

In order to support the calf's health and development, it is absolutely recommended to increase the value of the whole milk.

- Milk containing residues of antibiotics (blocked milk) resulting from treatment of lactating cows is not suitable for feeding calves.

BEWI-SAN Milk+ To supplement whole milk

- ✓ Essential trace elements such as iron, copper, zinc and manganese correct the deficiency from the whole milk and support the calf's immune system
- ✓ Compensates for the deficits of whole milk and adapts it to the calves' needs
- ✓ Slightly acidified – promotes digestion and prevents the growth of bacteria
- ✓ Promotes the renneting of the whole milk and thus eases the sensitive digestive process
- ✓ Strengthens calves' immunity and fitness



Application:

As a valuable supplement to whole milk feeding over the entire milk-feeding phase. The dosage is 10 g **BEWI-SAN Milk+** / litre of whole milk.

- **BEWI-SAN Milk+** ensures that the calf receives an adequate amount of iron.

Packaging:



10 kg bucket



25 kg bag

5.4 Increased fluid requirements

Diarrhoea

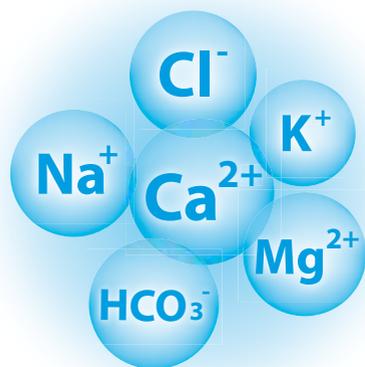
In case of diarrhoea the calf does not only lose high amounts of liquid, but also electrolytes, which must be recovered over the drinking trough. Electrolytes are acids, bases and salts forming a sensitive balance that is the basis for a range of important biochemical processes in the body. A disruption of this balance can be perilous for the calf.



High outside temperatures

Calves become uncomfortable when the ambient temperature is around 20°C or higher. In this situation, they are no longer able to regulate their own heat balance. They are often soaked with sweat, listless and eat less. Through sweating the calves do not only lose liquid, but also essential electrolytes.

They have to be recovered over the drinking. Liquid supply through the milk is not sufficient. It is indispensable to offer the calf an additional electrolyte-drinker to cover its demand.



BEWI-SAN Bewilyt For electrolyte and fluid loss

- ✓ Dietary supplement to regulate the electrolyte balance during introduction to a new stall and in cases of diarrhoea
- ✓ Immediately available energy quickly gets the calf back on its feet
- ✓ Replaces lost fluid
- ✓ Supports the immune system through its vitamins and increases vitality
- ✓ Normalises the acid-base ratio in the blood



Application:
In phases of increased demand (heat, changes in feed, moving into and changing stalls):
50 g/L water (temperature around 30°C), freely available.

In the case of diarrhoea:
Use as an interim drink in addition to **BEWI-SAN Diätmix**.
50 g/L water (temperature around 30 °C), approx. 1 L per 10 kg body weight.

Packaging:



• **BEWI-SAN Bewilyt** is more than just an electrolyte drink. Vitamins are an additional safeguard.

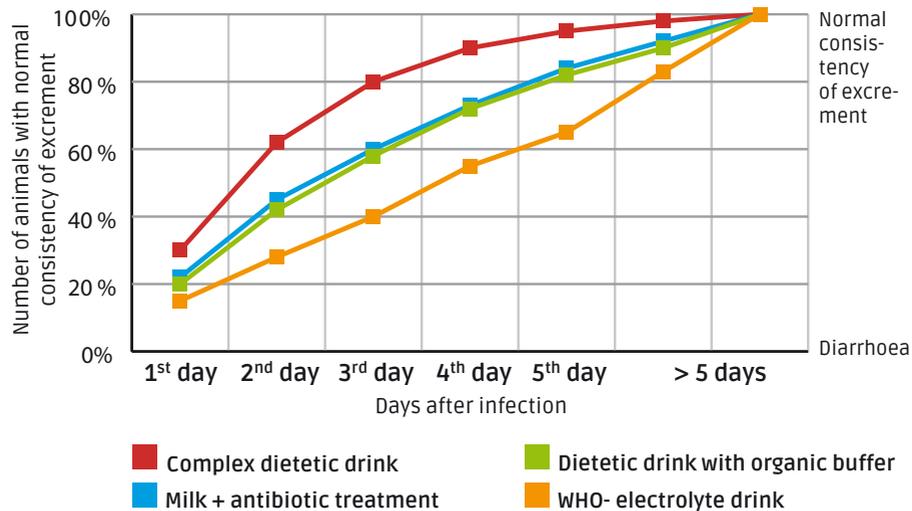
5.5 Diarrhoea is main cause of losses in calf rearing

Diarrhoea, which occurs in the first four weeks of a calf's life, are some of the most common stock problems with the highest losses

React immediately

The most important thing is, to react immediately if diarrhoea occurs. If the calf does not drink anymore, it could be too late. The diarrhoea not only causes a high loss of fluids, but the calf also loses electrolytes and buffer substances. These losses have to be compensated as fast as possible to prevent dehydration and to satisfy the calf's requirement of nutrients and energy.

Overview: The influence of the dietetic drink on length of diarrhoea (According to Kaske, 2009)



• Complex dietetic drinks (like **BEWI-SAN** Diätmix) are superior.

BEWI-SAN Diätmix

In case of calf diarrhoea (sporadic, non-infectious)

- ✓ Dietary supplement with natural dietary components
- ✓ Compensates for the loss of electrolytes and fluids
- ✓ Normalises intestinal function
- ✓ Provides the calf with vitamins
- ✓ Stabilises the immune system
- ✓ Supplies quick energy
- ✓ With appetising fenugreek



Application:

In cases of mild diarrhoea and for prevention (do not stop feeding milk):

50 g per litre of drink; spread out drink quantity of 2-4 litres over 3 meals; use: 3 days.

In cases of severe diarrhoea (stop feeding milk):

75-90 g per litre of drink; amount of drink: 1.5 litres per meal; 3 meals per day; use: 2 days. Then switch to milk as in the case of mild diarrhoea.

Packaging:



• Always offer **BEWI-SAN** Bewilyt as an interim drink.

5.6 Stabilisation of growth performance

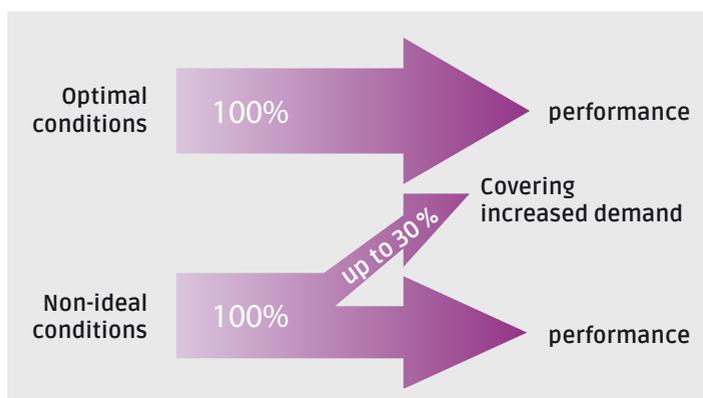
During rearing, the growth potential of the animal should be maximised. Stress during this phase costs the animal energy and therefore usually also growth. It is therefore very important to cover this increased demand of the calf. This will prevent growth depression and minimise financial losses.

Inanimate stressors: e.g. transport, changing stables or feed, weaning

Animated stressors: e.g. viruses, bacteria

The farm management and "having an eye for the animal" is often a key factor. Inanimate factors can often be minimised by simple management measures. Supporting the immune system is extremely important to prevent negative effects.

- **BEWI-SAN Pulmo** supports the calf's immune system in situations of increased need.



BEWI-SAN Pulmo To stabilise growth performance

- ✓ Supports the animal during stress
- ✓ Promotes a balanced feed intake
- ✓ To avoid growth depression
- ✓ In phases of increased demand
- ✓ Supports the body's defences
- ✓ Promotes consistent, healthy growth
- ✓ With appetising fenugreek



Application:
Mix 10 g **BEWI-SAN Pulmo** into the milk feeder per animal and per day. Can be used during the entire milk-feeding phase.

Packaging:



5.7 Encouraging calves to eat early on

In calf rearing, the transition from pure milk nutrition to complete feed is an important process that is associated with challenges. Problems in the transition phase can have negative, long-lasting effects on the calf. For this reason, promoting rumen development and ensuring health during this phase is very important.

Both can be promoted even with small amounts of **BEWI-SAN Start Flakes**.

Important components in **BEWI-SAN Start Flakes**:

- Selected vegetable fatty acids as activated component proactively contribute to a healthy micro flora.
- Carefully selected aroma and appetizing substances ensure high feed intake and with that support efficacy of all components.

The combination of carefully selected, high quality ingredients and substances in **BEWI-SAN Start Flakes** creates proven synergistic effects.



BEWI-SAN Start Flakes For feeding young calves

- ✓ Energy rich complementary feed for accompanying calves during the first days in life.
- ✓ Highly digestible and palatable recipe for high feed intake.
- ✓ Alfalfa as highly digestible fibre component ensures early support of rumen development.
- ✓ Balanced energy protein ratio ensures best properties for supplementing young calves.
- ✓ With appetising fenugreek



Application:

Offer **BEWI-SAN Start Flakes** and clean drinking water in addition to the milk feed for free intake during the first weeks of the calf's life.

With a sufficient intake of 1 to 1.5 kg per animal per day, it is easy to switch to mixed rations/good silage and concentrates.

Packaging:



20 kg bag

6 | Annex



Picture: Urbanonline

Rearing intensity

Female heifers should have a live weight of about 550 kg directly after calving. During insemination the live weight must be at least 380 kg (better 400 kg). On the basis of this objective and the aspired age at first calving the required rearing intensity of the calves can be calculated.

First calving age in months	22	23	24	25
Main insemination month	13	14	15	16
Target weight gain in the first 6 months after birth (g/day)	1000	950	850	800

- The optimal rearing intensity depends on the expected age at first calving and the breed. To reach an aspired age at first calving of 24 months Holstein-cows should have a daily weight gain of 750-800 g during the first five months.

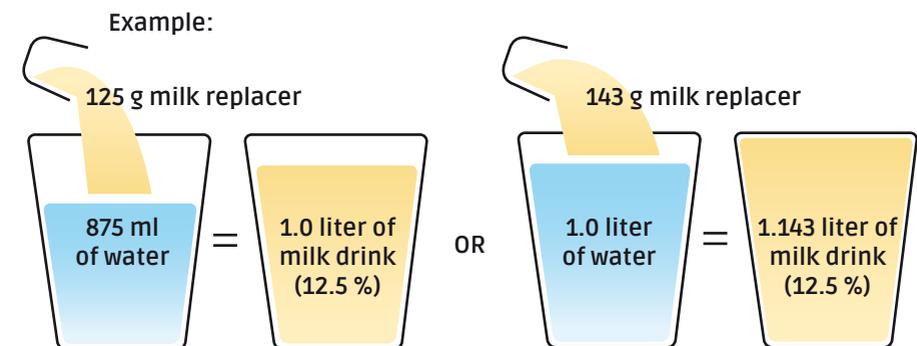
Milk feeding concentration

In natural milk the medium content of dry matter is about 12.5 %. Calf milk replacer should have at least this concentration as well to ensure an optimal digestion.

To achieve a concentration of about 125 g dry matter per liter milk feeding 143 g milk replacer per liter water has to be dosed. For intensive feeding the concentration should be increased to 160 g per liter water. Recent studies show best effects on health and performance with optimum digestion.

desired concentration in g per liter finished drink	amount of g milk replacer in g per liter water
125	143
138	160
152	180
160	190

- By use of automatic feeders (e.g. Förster-Technik) the amount of g milk replacer per liter water must be entered (i.e. for example 143 g per liter water to get the desired target concentration of 125 g per liter milk drink).



Drinking plan for intensive calf rearing

Aim: at least **800 g daily weight gain** during milk feeding period

	800 g daily growth	1000 g daily growth		
Weeks of life	Drinking quantity in l/day	Drinking quantity in l/day	Concentration	
1	bis 7*	8*	160 g/L water 138 g/L milk drink	Water and high quality hay for free intake For weaning the calf should at least show a daily intake of 2 kg of concentrate feed
2	7	10		
3	8	10		
4	8	10		
5	7	9		
6	6	8		
7	5	7		
8	4	6		
9	3	5		
10	2	4		
11	-	3		
	Consumption approx. 55 kg milk replacer/ calf	Consumption approx. 75 kg milk replacer/ calf		

* Offer colostrum with **BEWI-SAN Milk+** twice a day at free disposal. Slowly change to milk replacer. During the winter months the volume of the milk meal should be increased to cover the calf's energy requirement.



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