FEEDING CONCEPT FOR CALVES AND YOUNG CATTLE
Sano is the major European brand for mineral feed, calf milk and specialties for modern animal nutrition. Convince yourself of our calf concept with products specially adapted to every phase of life and performance for healthy growth of your animals and successful management on your farm.

**SANO MILK REPLACERS, SUPPLEMENTS AND ADDITIVES – FOR THE BEST POSSIBLE SUPPLY OF FEED WITH NUTRIENTS AND ACTIVE INGREDIENTS OF HIGH QUALITY**

**Colostrum phase**

- **COTOSAN PLUS®**
  - The colostrum supplement for healthy and resistant calves

- **MEGGI MÜSLI®**
  - Top calf muesli for quality calves

- **MEGGI 10®**
  - The safe calf starter concentrate for quality calves

**Drinking phase**

**MILK REPLACER**

- **SANOLAC STARTINO®**
  - Calf milk for the metabolic sprint

- **SANOLAC® SPRINT**
  - Acidified milk for intensive rearing

- **AM18**
  - Thick and creamy milk with skimmed milk powder

- **MILLI M®**
  - Colostrum milk for the first weeks of life

- **MILSAN®**
  - Calf milk for rapid rumen development and safe weaning

- **SANOLAC LILACITRO®**
  - The milk replacer including acidification

**CALF STARTER**

- **MEGGI 10®**
  - The safe calf starter concentrate for quality calves

- **MEGGI MÜSLI®**
  - Top calf muesli for quality calves

- **MEGGI MÜSLI®**
  - Sano calf starter for best rumen development

**LATTECCINO®**
- Makes cow’s milk valuable and promotes resistance
<table>
<thead>
<tr>
<th>SUPPLEMENTARY PRODUCTS</th>
<th>CALF COLOSTRUM/DRINKING PHASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACIDOSAN®</td>
<td>Makes calf’s milk durable and protects against diarrhea</td>
</tr>
<tr>
<td>SANOLYTE®</td>
<td>Best electrolyte supply for calf diarrhea</td>
</tr>
<tr>
<td>ANTILAXAN®</td>
<td>The active ingredient combination against calf diarrhea</td>
</tr>
</tbody>
</table>
Our daily aspiration and motivator is to strive for healthy growth in general and particularly in modern animal nutrition. Consequently, the Sano sense is worded as follows:

“Sano has a global responsibility to develop agriculture day by day. Together with dedicated employees in all Sano companies worldwide, we make a significant contribution in the fields of animal nutrition and animal health. Sustainable and for the benefit of nature, man and animal.”

With 40 years of experience and competence in the field of modern animal nutrition, we provide farmers with the best possible service. Together we meet the daily demands of agriculture and make a decisive contribution to healthy growth with highly effective products, competent advice and future-oriented research.

Our Sano feeding experts stand for personal, cooperative and holistic advice on all aspects of your individual needs. The service to customers and animals and the associated improvement of the cost, husbandry and production structure on the farm are at the center of our activities. Our products guarantee you high-quality feed and high-performance ingredients. The Sano feeding concept is your daily companion for the professional implementation of this concept. Clearly arranged and scientifically based, structured according to life and performance phases, you will receive simple and comprehensive instructions for achieving individual farm goals, as well as answers to general feeding questions and valuable practical tips. Successful animal nutrition has never been so simple and effective at the same time.

Healthy growth is not just a slogan for Sano. As our contribution to your success, we develop these guiding principles on a daily basis in cooperation with scientists, nutrition specialists, veterinarians and practitioners.

Richard Waldinger, CEO
THREE FACTORS FOR SUCCESS

PRODUCTS
The challenges you face as an animal feed producer are becoming increasingly diverse. On the one hand, there is the need for sustainable, economic cattle rearing and on the other hand, the question of how you can benefit from the latest nutritional and physiological findings and make the right decisions on drinking and ration design as well as animal welfare. An optimal supply of nutrients depending on the phase of life and performance is more important today than ever. Benefit from our products and functional active ingredient complexes specially developed for your calves and young cattle and exceed your operational goals.

CONSULTING
In calf rearing, you establish the basis for high efficiency and a long life for your dairy cows. This phase offers numerous opportunities to make more intensive use of existing reserves, but also to reduce costs by shortening the rearing period. The intensive rearing of your calves pays off early on. The calves are positively influenced in their organ formation and start with higher performance already in the first lactation. Benefit from the Sano consulting concept, the latest dynamic ration calculation software and the optimization of your income over feed costs (IOFC) – for a sustainable and successful calf and young cattle rearing.

CONTROLLING
An intensive, demand-oriented calf and young cattle rearing is a prerequisite for keeping dairy cows sustainably and successfully in the future. Check the success of the goals you have achieved through joint controlling with your local consultant. Taking into account your individual situation on the farm, you and your specialist consultant carry out a target/actual comparison to realize a cost-efficient calf and young cattle rearing. We show you how to master farm and production-specific challenges in the long term and how to raise healthy and productive dairy cows.
OPG: DAILY WEIGHT GAIN AND DEVELOPMENT OF LIVE WEIGHT

The advantages of intensive calf rearing for sustainable animal production are mainly based on the positive influence of organ formation and epigenetic imprinting (activating/influencing favorable genome sections) of young animals. In addition to the development of the heart, kidneys, lungs and liver, the maturation of udder gland tissue lays the foundation for reaching the genetic performance potential of the dairy cow. Since hyperplastic development of the organs and udder (caused by an increase in cell count) is already complete after the first six weeks of life, the greatest advantages of ad libitum drinking with high-quality milk replacers can be found in this period. For example, the advantageous development of the liver can be seen in the improvement of gluconeogenesis and metabolic performance. Heart and kidneys benefit from intensive rearing by increasing performance and metabolic functions. The optimized growth of udder gland tissue results in a higher milk production capacity, with up to 275% more gland tissue and 75% more udder mass (Brown 2011).
The aim of calf rearing is to achieve the development of a healthy dairy cow with a high daily performance. This can only be achieved through successful metabolic programming.

Several studies show that intensive calf rearing has a positive effect on the performance of young cows. Intensively bred calves have fewer cases of disease as well as fewer losses and achieve a higher milk yield in the first lactation (on average +772 kg milk).
Calf Diseases and Their Consequences

Treatment Measures:

Prophylactic:
- In-Out method
- Dry, draft-free lying area
- Hygiene
- Maternity vaccination
- Optimum mineral and vitamin supply
- Acidification of the milk to reduce bacterial load
- Excellent colostrum quality and optimal colostrum management

Curative:
- Provision of electrolytes and quickly available energy sources such as glucose
- Compensation of metabolic acidosis by using buffers
- Specific measures

Long-term consequences:
- Calf diarrhea increases the risk of pneumonia by a factor of 18
- Postponement of the first calving age by up to 1.3 months
- Increase in the replacement rate by up to 9
- 2.5 times higher probability of loss in first calf cows

Metabolic Acidosis

Metabolic acidosis (drop in blood pH) results in an accumulation of H+ ions in the blood and is a consequence of diarrhea diseases of the calf. Calves suffering from diarrhea have a large loss of strong cations (Na+ and K+), which leads to an increased content of H+ ions and anions (lactate) in the blood. Without the right treatment (Calf digest®/Calf sodalyte®) the calf dehydrates, in the worst case the animal may die.

Measures to Prevent Metabolic Acidosis

Sufficient supply of strong cations (Na+ and K+) to balance the calf’s water balance
- Promoting the absorption of Na+ and water from the intestine
- Compensation of metabolic acidosis by using buffers
- Provision of rapidly available energy sources such as glucose

Appearance of excrements

- White-yellowish, thinning in the course of time
- Grey, thick, blood-stained
- Yellow-glossy, bloody, slimy
- Aqueous
- Low defecation
- Slimy, with blood and fibrin additions

Symptoms

- Dehydration, acidosis, debilitation
- Urge to defecate, acidosis, debilitation
- Continued weakening
- Dehydration, acidosis
- Sudden calf death, hemorrhagic/bloody intestinal inflammation
- Fever, dehydration, metabolic acidosis

Viruses
- Coronavirus
- Rotavirus

Protozoa
- Cryptosporidium parvum
- Eimeria spp.

Bacteria
- Clostridium perfringens
- EPEC
- Salmonella spp.
- ETEC
- EPEC

Days

5 10 15 20 25 30 35 40 45
The highly effective Sano Veterinary product line is dedicated to promoting animal health and welfare. To this end, it pools the experience and expertise of farm veterinarians, Sano feeding experts and farmers.

Below find an overview of the latest calf products. Sano Veterinary guarantees access to powerful and high quality products. Extensive practical tests confirm the effectiveness of our products.

**Calf immuno®**
Perfect immune system for the calf

Natural egg immunoglobulins act like maternal colostrum. They attach themselves to the binding sites of viruses and bacteria. The harmful bacteria are blocked and cannot adhere to the intestinal epithelium.

- Immunoglobulins (IgG1, IgG2, IgM, IgA) from colostrum of the first milk strengthen the calves’ resistance and protect them from life-threatening diseases.

- Vitamins A, E, C and beta-carotene strengthen the immune system.

- Glucose, the rapidly available energy source, compensates for the energy deficit in stressful situations for example during birth.

- Probiotics regulate the intestinal flora and displace pathogenic bacteria from the digestive tract.

**Calf fit®**
The iron booster in the first hours of life

Almost 19% of all naturally born calves have a significant iron deficiency. Studies show that the supply of the calves with iron is not ensured even through the cow’s milk. This is exactly where the effect of Calf fit® comes into play:

- Calf fit® effectively compensates iron deficiency through the highly available iron glycinate it contains.

- Calf fit® counteracts a weak sucking reflex with selenium in inorganic form and in the form of selenium yeast.

- The combination with vitamin E strengthens the effect and additionally promotes the immune system. Probiotics regulate the intestinal flora and displace pathogenic bacteria from the digestive tract.

**Calf digest®**
Stimulates appetite in case of hyperacidity

Double mechanism of action – Calf digest® Bolus combines two valuable active ingredients:

- Calf digest® contains the active probiotic Enterococcus faecium M74 with a concentration of 1 x 10¹¹ CFU per bolus. These special lactic acid bacteria have a proven inhibitory effect on pathogenic bacteria, colonize the intestines and regenerate the intestinal flora.

- Calf digest® contains a buffer substance that reduces acidosis. This increases the pH value and the appetite returns.

**Calf sodaLyte®**
Cost-effective energy and electrolyte supply for diarrhea

- The most cost-effective and powerful alternative to electrolyte tablets.

- Easy dosage and residue-free dissolving.

- Highly digestible glucose as a rapidly available energy source.

- Sodium, potassium and chlorides compensate electrolyte losses.

- Bicarbonate and acetate buffers counteract blood hyperacidity and congestion.

- Sugar and citric acid ensure a good taste.
FACTORS INFLUENCING THE DEVELOPMENT OF CALF IMMUNITY

Nutrition + genetic imprint foetus/calf

Colostrum
  - Quality
  - Quantity

Nutrition + genetic imprint maternal
  - Fatty acids
  - Vitamins
  - Trace elements
  - Amino acids

Thermal treatment

Immunoglobulins, growth factors, hormones

Intestinal ripening

Nutritional supplements (Pre- + Probiotics)
  - Totality of intestinal microorganisms (intestinal microbiome)

IMMUNITY
Securing the genetic performance potential is the first step towards sustainable animal production. For example, the development of the immune system and organs, daily weight gain, the transition to ruminant and the first calf age of young cattle depend decisively on feeding. The rearing of young cattle begins with the correct maternal nutrition and epigenetic imprinting of the embryo.

The adequate addition of vitamins, trace elements and the ideal amino and fatty acid pattern actively influences pro- and anti-inflammatory processes in the pregnant cow and supports the supply of the embryo and the formation of high-quality colostrum.

The most important ingredients of colostrum are antibodies (IgG, IgA and IgM), immune cells and immunomodulators, which are important for the development of the immune system. The nutrients (protein, fat and lactose), bioactive substances and laxatives act in the metabolism and intestines. However, the calf’s need for vital vitamins (especially vitamins A, C, E and β-carotene) and trace elements (especially iron) cannot be met purely by cow’s milk.

The boosting of colostrum with vitamins, immunoglobulins (IgG1, IgG2, IgM, IgA), special antibodies against E. coli, rota, coronaviruses, clostridia and para-influenza to strengthen the immune system and protect against life-threatening diseases, represents an important investment in profitability. Furthermore, supplementation with iron and organic selenium, e.g. by oral bolus administration, supports blood formation and promotes the calves’ metabolism and resistance.

Until about the 6th week of life, the development of the calf is determined by hyperplastic growth (cell division), then predominantly by hypertrophic growth (cell mass increase). In this subsequent phase, the correct choice and feeding quantity of the milk replacer (e.g. Sanolac Startino®, Sanolac® Sprint, Sanolac® Yellow) influences the tissue structure and lifelong organ function.

The positive impact on organ growth, animal health and performance is reflected in more economical and sustainable milk production for a cow’s life.

SUSTAINABLE ANIMAL PRODUCTION STARTS WITH OPTIMAL REARING OF YOUNG CATTLE
THE PERFORMANCE PHASES OF CALF REARING

**COLOSTRUM PHASE**
1. How can passive immunization be effectively achieved via colostrum?
2. How can calves’ vitality and feeding intake be increased?
3. What parameters are available to prevent calf losses?

**DRINKING PHASE**
1. How can a rapid development of the rumen and a good formation of the rumen villi be achieved?
2. How can high daily weight gain be achieved?
3. What parameters are available to prevent calf losses?
Calves are born without any antibodies to ward off pathogens, i.e. completely unprotected. The newborns must absorb the necessary antibodies completely via colostrum. The colostrum thus ensures passive immunization. The calves' own active immune defense develops slowly at an age of 3 to 5 weeks. Until this point in time, they are exclusively dependent on the passive protective effect of the antibodies taken up with colostrum.

The most important ingredients of colostrum are antibodies (IgG, IgA and IgM), immune cells and immunomodulators, which are essential for the development of the immune system. The nutrients (protein, fat and lactose), quantitative and trace elements, vitamins, bioactive substances and laxatives have an effect on the metabolism and intestines. Frequent practical problems in the colostrum phase are 1. the quantity obtained by the maternal animal, 2. the quantity absorbed by the calf and 3. the quality of the colostrum. All three factors, if they do not correspond to ideal values, impair effective immunization of the calf. The colostrum phase, however, forms the basis for the rearing of healthy and resistant calves. For optimal management in the colostrum phase, the following key questions must therefore be answered:

1. How to achieve effective passive immunization via colostrum?
2. How can calves’ vitality and water intake be increased?
3. What parameters are available to prevent calf losses?

Your Sano consultant will be happy to help you answer these questions. Following you will find additional information on the requirements for nutrition, husbandry and management of your animals in the colostrum phase as well as the specially adapted products of the Sano catalog.

YOUR GOALS IN THE COLOSTRUM PHASE

- Passive immunization ✔
- Vital calves with high drinking capacity ✔
- Avoiding calf losses ✔
SANO SUCCESS STORY

+800 KG MILK per cow per year

“Today’s calf is tomorrow’s cow. With Cotosan Plus® and Latteccino® we have stable and healthy calves.”
Hengl family

Company profile.
Albert und Anton Hengl
160 Fleckvieh dairy cows plus female offspring
29 ha pasture
69 ha farmland
Seubersdorf-Wissing, Bavaria

SANO SUCCESS STORY

0%

Rearing losses 2016

“The problem with diarrhea was quickly solved by changing to Sanolac Startino® milk replacer.”
Family Kollenberg

Company profile:
Kollenberg family
120 Holstein and Braunvieh dairy cows plus own offspring
Marienheide in the Bergisches Land, North Rhine-Westphalia
KNOWING WHY – THE COLOSTRUM PHASE INFLUENCES THE WHOLE LIFE OF THE ANIMAL

QUICK READ:
- Calves need 3 to 4 liters of colostrum within 3 hours after birth.
- Colostrum with 70 g immunoglobulins per liter is said to be of good quality.
- For sufficient immunization, experts recommend 200 g immunoglobulins with the first meal.
- For colostrum of moderate quality, a boosting of colostrum with Cotosan Plus® is recommended.

COLOSTRUM: UPTAKE INTO THE BLOOD

The level of the protective effect of colostrum depends on two factors: on the one hand from the moment of colostrum intake and on the other hand on the concentration of immunoglobulins. The antibodies ingested with colostrum enter the bloodstream through the small intestine mucosa. From there they fulfil their defensive tasks in the organism. However, the ability to pass through the mucous membrane of the small intestine undigested is only given in the first hours of life. The mucosa of the small intestine becomes increasingly impermeable with time. Only about 50% of the immunoglobulins can be absorbed within 6 hours of birth.

Antibody passage rate through the small intestine mucosa of the calf

Colostrum/transitional milk

Immunoglobulins [g/l]

Immunity

Level of immunity
COLOSTRUM: TRIPLE EFFECT

1. Energy source for the newborn calf.
2. Passive immunization by immunoglobulins protects against infections.
3. Proteins, growth factors and immune regulators promote the formation and maturation of the intestine.

The cow’s colostrum and transitional milk contain bioactive ingredients such as oligosaccharides. As prebiotics, these indirectly promote the useful intestinal microbes. The immune cells in the intestinal epithelium multiply and inflammatory processes in the digestive tract become suppressed. Studies show: The intestines of calves that have received high-quality colostrum over a longer period of time are better developed. These are the results of continuous feeding of colostrum via whole milk conditioners and milk replacers even after the first day of life:

▶ Higher number of intestinal epithelial cells in total
▶ Longer villi
▶ More receptors for growth factors are formed in the intestinal epithelium: IGF-1, IGF-2 and insulin receptors

(Source: McDermott & Huffnagle, 2013; Hammon and Blum, 2000 & 2002; Roffler et al., 2001)

COLOSTRUM: QUALITY

The calf needs about 200 g immunoglobulins with the first meal for sufficient immunization (M. Göbel, Förster Technik). This means:

1. For good quality colostrum, e.g. with a concentration of 70 g immunoglobulins per liter, the calves must absorb approx. 3 liters of colostrum within the first 3 hours of life.
2. With moderate quality colostrum, e.g. with a concentration of only 35 g immunoglobulins per liter, the calves should absorb almost 6 liters of colostrum within the first 3 hours of life!

The concentration of immunoglobulins in colostrum also depends on the age of the cows. Cows from the third to fourth lactation have the best colostrum quality with the highest concentrations of immunoglobulins. To ensure that the calves are sufficiently supplied with antibodies, the colostrum should contain at least 70 g of immunoglobulins per kg. This can be determined very easily with a colostrometer (see picture at top right). Quality can also be assessed on the basis of colostrum consistency: A good colostrum is characterized by a honey-like consistency.

Traditional measurement

A newer measurement index is the determination of the refractive index by means of a refractometer with a Brix scale (figure below). This method has the advantage over the colostrometer that it requires less “sample material” (a few drops vs. 250 ml), is temperature-independent and has a higher accuracy. The limit value for good colostrum quality is 21 to 22 %Brix (shown in the right picture; Quigley et al., 2013; Bielmann et al., 2010). The quality of mixed milk replacers is also comparable to the Brix scale. However, the effects of acids and other active substances contained in the milk replacer should be taken into account. Both optical and digital refractometers are available on the market. Both work according to the same principle. Important is:

1. The refractometer must have a %Brix scale.
2. The displayed measuring range must be at least 0 to 30 %Brix.

Measurement with refractometer

Explanatory of the results

<table>
<thead>
<tr>
<th>%Brix</th>
<th>colostrum quality</th>
<th>IgG (g/l)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 17</td>
<td>bad</td>
<td>0–25</td>
</tr>
<tr>
<td>18–20</td>
<td>poor</td>
<td>25–50</td>
</tr>
<tr>
<td>20–30</td>
<td>good to average</td>
<td>50–100</td>
</tr>
<tr>
<td>&gt; 30</td>
<td>very good</td>
<td>&gt; 100</td>
</tr>
</tbody>
</table>

* Concentration of gamma globulin per liter of colostrum

(Source: Kerbl; www.melktechnik-discount.de)
COLOSTRUM: HYGIENE AND MANAGEMENT

In order to milk the colostrum free of bacteria, the cow's udder must be cleaned and disinfected before milking. Appropriate hygiene during milking is important, as the small intestine mucosa of the newborn calves is permeable not only to the immunoglobulins, but also to all bacteria that can possibly contaminate the colostrum.

The colostrum should be mixed in a teat bucket or a teat bottle. This allows an exact control of the time of intake and the quantity of colostrum. If the calf is sucking uncontrollably, this is not possible. It also makes sense to create a colostrum pool: freeze excess colostrum from the first milk in portions of 0.5 to 1 liter; thaw gently if necessary and heat up slowly in a water bath not above 40 °C. Do not overheat in the microwave, otherwise the proteins will denature!

NEWBORN CALF NUTRITION PLAN

The calf needs about 200 g immunoglobulins with the first meal for sufficient immunization. The less immunoglobulins are contained, the more colostrum the calf has to absorb. However, the absorption capacity of the newborn calf is limited. If the calf does not absorb colostrum at all, it is recommended to drench in order to ensure an adequate supply.

Our expert recommendation for a healthy colostrum phase:
Optimize the colostrum of your cows with a high-quality colostrum booster. In addition to a high content of immunoglobulins, it should also contain vitamins, glucose and probiotics. Because with vitamin E, C and β-Carotene, Fe & Se you additionally strengthen the immune system and increase the defense power of the newborn calves. Dextrose serves the calf as a quickly available energy source. This is particularly important in stressful situations (e.g. birth) to compensate for an energy deficit. Probiotics regulate the gastrointestinal flora and displace pathogenic bacteria from the digestive tract. This creates the best conditions for effective passive immunization and vital calves with a high drinking capacity.

Feed the Sano colostrum booster as follows:
1. Stir one bag (50 g) into 1 liter of the first colostrum and feed it immediately after birth. Then immediately fill the bucket with another 2 to 3 liters of colostrum and continue feeding. In this way you can be sure that the calf will definitely absorb the booster.

2. If no colostrum from the mother is available, use the booster as a colostrum substitute. Stir double the amount (100 g) into 1 to 2 liters of water or even better into UHT milk.
COLOSTRUM BOOSTING WITH COTOSAN PLUS®

Sano has developed a special colostrum booster for a healthy, safe start to life. This combines high-quality tested colostrum of the first milk with antibodies against E. coli, rota and corona viruses, clostridia and parainfluenza with glucose, vitamin E and C, β-Carotene as precursor of vitamin A and lactic acid bacteria Fe & Se: Cotosan Plus®.

The product is pre-portioned in 50 g bags for easy and hygienic application. Cotosan Plus® ensures an adequate supply of immunoglobulins and other antibodies for each calf. In this way you create the best and most effective conditions for passive immunization and vital calves with a high drinking capacity.

HOW DO I FEED MY CALVES AS NEEDED IN THE FIRST WEEK OF LIFE?

In the first 5 to 7 days of life, the calves are still fed with mother’s milk, as this cannot be sold due to its composition. However, drinking cow’s milk has some disadvantages. For example, cow’s milk is not able to meet the calf’s needs for vital vitamins (especially vitamins A, C, E and β-carotene) and trace elements (especially iron). This often leads to a reduced resistance of the animals, to a reduced feed intake and thus to a poor development of the calves. On the other hand, the increased milk content (especially fat) resulting from rearing often causes diarrhea in calves, as the digestive system of the animals has not adapted to the changed nutrient content of cow’s milk. As a result, the loss rate is increased and the development of the calves is inhibited.

OUR EXPERT RECOMMENDATION:

Use a high-quality whole milk booster to cover the calves’ vitamin and trace element requirements and to protect them from diarrhea and infectious diseases. For a protective effect against pathogenic bacteria in the digestive tract, a whole milk enhancer should contain dried colostrum from the first milk in addition to iron, other trace elements and vitamins. Also ground linseeds and probiotics unfold their protective effect on the intestinal walls and regulate digestion. The whole milk booster, which is stirred into the cow’s milk, ensures that the calves are supplied with all trace elements and vitamins as needed, thereby improving growth and resistance to diseases. This ensures that your calves are vibrant and resistant in the first week of life, and thus avoid losses.
WHOLE MILK BOOSTING WITH LATTECCINO®

Sano has designed the Latteccino® whole milk booster for precise and demand-oriented calf feeding with whole milk. Latteccino® is composed of trace elements such as iron and copper, vitamins, colostrum from the first milk as well as linseeds and lactic acid bacteria. Latteccino® thus creates the conditions for vital, resistant calves and helps to avoid losses. Latteccino® is fed with 100 g per animal per day. Stir 50 g Latteccino® into 3 liters of whole milk and feed 2 × 3 liters per day. The drinking temperature should be between 38 and 40 °C. Use Latteccino® as long as you feed the whole milk. From the 2nd week of life, the milk of the mother animal is generally marketable. It is therefore advisable to switch to a milk replacer. In addition, a calf muesli should be offered as early as the 1st week to promote the development of the rumen.

![Graph showing the effect of Latteccino® on the supply of iron to the calf.](image)

Effect of Latteccino® on the supply of the calf with iron

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mg iron/animal/day

<table>
<thead>
<tr>
<th>without Latteccino®</th>
<th>with Latteccino®</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>120</td>
</tr>
<tr>
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<tr>
<td>100</td>
<td></td>
</tr>
<tr>
<td>120</td>
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</tbody>
</table>

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The special Sano products for the colostrum phase promote an optimal start in the life of the calf. High-quality colostrum and whole milk boosters ensure healthy and resistant calves.
### COTOSAN PLUS®
The colostrum supplement for healthy and resistant calves

<table>
<thead>
<tr>
<th></th>
<th>Immuno-globulins (IgG1, IgG2, IgM, IgA) from colostrum of the first milk</th>
<th>Special antibodies against E. coli, rota and corona viruses, clostridia and parainfluenza</th>
<th>Vitamins A, E, C and beta-carotene</th>
<th>Dextrose</th>
<th>Probiotics</th>
<th>Selenium</th>
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<tbody>
<tr>
<td><strong>Cotosan Plus®</strong></td>
<td>![Checkmark]</td>
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<td>![Checkmark]</td>
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</table>

### LATTECCINO®
Makes cow's milk valuable and promotes resistance

<table>
<thead>
<tr>
<th></th>
<th>Colostrum of the first milk with immuno-globulins and antibodies</th>
<th>Appetite-stimulating brewer’s yeast and finely ground linseeds</th>
<th>Probiotics</th>
<th>Dextrose</th>
<th>Combination of vitamins and active ingredients</th>
<th>Iron</th>
</tr>
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<tbody>
<tr>
<td><strong>Latteccino®</strong></td>
<td>![Checkmark]</td>
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</table>

### ACIDOSAN®
Supplementary feed for the acidification of milk

<table>
<thead>
<tr>
<th></th>
<th>Formic acid</th>
<th>Propionic acid</th>
<th>Lignosulfonic acid</th>
<th>Advantages</th>
<th>Application</th>
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</thead>
<tbody>
<tr>
<td><strong>Acidosan®</strong></td>
<td>![Checkmark]</td>
<td>![Checkmark]</td>
<td>![Checkmark]</td>
<td>▶ Protects against pathogenic bacteria</td>
<td>▶ 2 ml Acidosan® per 1 l milk or milk replacer. Depending on water hardness:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>▶ Supports digestion in the abomasum</td>
<td>1–3 ml Acidosan® = pH value 5.5–4.8</td>
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</tbody>
</table>
After the colostrum phase, the calves receive 6 to 8 liters of calf milk and additional calf starter ad lib. In this phase of calf rearing, the focus is on calf health and rapid development into ruminants. Diarrhea and other life-threatening diseases must be avoided and calf losses reduced to a minimum. This is why particularly high demands are placed on calf milk and calf starters.

Calves should take in as much calf starter and as little basic feed as possible during the drinking phase, because the development of the rumen villi is clearly better promoted by the calf starter than by basic feed. It is essential that the calves are always given enough water to increase their solid feed intake. Only after the drinking phase the size of the rumen volume is developed by the intake of larger quantities of basic feed – i.e. silage and straw/hay. For optimal management during the drinking phase, the following key questions must therefore be answered:

1. How can a rapid development of the rumen and a good formation of the rumen villi be achieved?
2. How can high daily weight gain be achieved?
3. What parameters are available to avoid calf losses?

Your Sano consultant will be happy to help you answer these questions. Following you will find additional information on the nutrition, husbandry and management requirements of rearing your calves and the specially adapted products in the Sano catalog.
**KNOWING WHY – WHAT IS IMPORTANT DURING THE DRINKING PHASE**

**DRINKING MANAGEMENT AND RUMEN DRINKING**

Colostrum is very important, but it is not everything. Feeding calves with milk replacers during the drinking phase is also of great importance for their health and development.

The milk is digested in the abomasum. The so-called oesophageal groove forms during drinking so that the milk can be “cleanly” passed over the rumen into the abomasum. To avoid ruminal drinking resulting in ruminal acidosis in calves on a liquid diet, a sufficient concentration of milk replacer should be used. If, for example, the milk replacer is mixed too thinly, milk reaches the rumen, which cannot be digested there, and digestion/health problems can occur in the calf.

What happens to the milk in the small intestine in case of feeding errors? If the drinking temperature is wrong (too cold) or the rennet stomach is overloaded (too much), uncoagulated milk enters the small intestine, which becomes alkaline and coli bacteria can multiply, leading to diarrhea.

In ad libitum drinking, the milk is acidified and the calf takes up several small portions throughout the day. This also makes cold drinking possible and the abomasum is not overloaded. The selection of a suitable milk replacer is important for future-oriented intensive calf rearing.

Rumen drinking – following points should be avoided:
- Quantity of milk too much
- Milk temperature too low
- Dilution of cow’s milk with water
- Bucket feeding without teat
- Drinking too fast (stress)
- Stable climate fluctuations (climate stress)
- Diseases, pain
- Sensitivity of the pharynx (respiratory diseases)

Teat advantages:
- Satisfying the need for suction
- Oesophageal groove reflex
- Reduced risk of rumen drinking
- Slow Drinking
- Higher saliva production, thus better digestion of fat through the enzymes contained in saliva
AD LIBITUM DRINKING

QUICK READ:
- Calves fed ad libitum have more efficient organs than cows, a more stable metabolism and give more milk.
- Due to the better nutrient supply the animals achieve higher weight gain during rearing and have a more efficient immune system.
- Ad libitum drinking is generally recommended for the first 3 weeks of life. Specially developed for this purpose: Sanolac Startino® with 50% skimmed milk powder and protein made exclusively from dairy raw materials.
- Meggi® calf starters from the 3rd day of life and water for free intake promote the development of rumen microbes and villi.

THE METABOLIC SPRINT

In ad libitum drinking, the calves receive cow’s milk or milk replacers for free intake in the first 3 weeks of life. This means that the animals can absorb as much as they want. For this it is important that the calf always has a full drinking bucket at its disposal or that it can consume an unlimited quantity (divided into small portions) at the automatic feeder. From the 4th week the quantity is then rationed (as with conventional feeding) and the animals receive 10 liters per day. Until weaning at the end of the 10th week, the quantity will be continuously reduced. It is important that the MAT concentration is kept constant at 160 g per liter of water.

Why ad libitum drinking? Metabolic Sprint means: more milk as a calf – more milk as a cow!
Only strong calves become strong cows – and that is the goal of every dairy farmer. Intensive feeding in the first weeks after birth for healthy and joyful calves as a basis for powerful, fertile and long-living cows is becoming increasingly important as a result of scientific studies and practical experience. International and national studies show that during the first weeks of life calves fed ad libitum with milk are healthier and grow up faster and become better dairy cows. What are the reasons?

Three good reasons for the Metabolic Sprint concept:
1. The development of functional tissue in the organs important for metabolism and performance (heart, liver, pancreas, kidney, udder, etc.) is largely dependent on nutrition in the first weeks of life. During this time, the growth of calves takes place increasingly through cell proliferation due to cell division (hyperplastic growth). After that, it is no longer the number but the volume of the cell that grows – through cell enlargement and water and fat storage (hypertrophic growth).
2. In addition, decisive metabolic functions are defined in the first weeks of life, which are described by the term “metabolic programming”. The aim here is to optimize the metabolic health of the later cow through the feeding level during the drinking phase. Nutritional stimulation (ad libitum drinking) during the first weeks of life has a lifelong positive effect on the metabolism of dairy cows (higher milk production, improved fertility and health).
3. Another reason for an intensive supply of powdered milk during the first weeks of life is the calves’ high protein accumulation capacity in this phase, which decreases over time despite increasing daily weight gain in favour of fat accumulation. In this early stage of life, the feed conversion is very good (the highest in the whole life). And the high daily weight gain in this early period are accompanied by a lower obesity – in contrast to high daily weight gain after puberty, which usually lead to a stronger fat accumulation.
IMPLEMENTATION OF AD LIBITUM DRINKING

Ad libitum rearing according to the Metabolic Sprint concept is only possible with a milk replacer containing a high proportion of skimmed milk powder. Sano has developed the milk replacer Sanolac Startino® for an ad libitum calf feeder: Sanolac Startino® contains 50% skimmed milk powder and therefore only highly digestible milk protein for high daily weight gain. With lactic acid bacteria as probiotics and the active plant ingredient SangroSan® provides Sanolac Startino® for a healthy digestive tract and better control of inflammation and infections. In addition, colostrum from the first milk ensures improved protection against infection in the digestive tract.

Advantages of feeding colostrum:
- Positive effects of immunoglobulins in the intestine: 1st and 2nd week of life
- Positive effects of IGF and insulin for the intestinal epithelium: 1st to 7th week of life

Drinking plan: Ad libitum drinking

Advantages of feeding colostrum:
- Positive effects of immunoglobulins in the intestine: 1st and 2nd week of life
- Positive effects of IGF and insulin for the intestinal epithelium: 1st to 7th week of life

SANO SUCCESS STORY

INCREASE OF MILK YIELD TO 9000 KG

with approx. 4 months on the alpine pasture

“Since the implementation of the Metabolic Sprint concept, calves have become significantly more vital, diarrhea problems have been reduced, daily weight gain has increased and the quality of bull calves has improved”. Family Laubichler

Company profile:
50 ha pasture
80 Pinzgau dairy cows plus female offspring
Products: Sanolac Startino®, Milli M®, AcidoSan
The Sano Metabolic Sprint concept combines a high-quality, highly digestible milk replacer, supplemented by functional active ingredients for calf health, with a tasty calf starter for rapid rumen development. The Sano Metabolic Sprint concept offers successful dairy farmers everything calves need for an ad libitum feeding.
# Sano Feeding Concept

## DRINKING PHASE

### PRODUCTS

#### SANOLAC STARTINO®

Calf milk for the metabolic sprint

<table>
<thead>
<tr>
<th>Skimmed milk powder</th>
<th>Sweet whey powder</th>
<th>Colostrum of the 1st milk</th>
<th>Combination of vitamins and active ingredients</th>
<th>Sangro-San®</th>
<th>Probiotics</th>
<th>Acid combination</th>
<th>Product benefits</th>
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Sanolac Startino®

- High daily weight gain
- Intensive drinking phase
- Healthy and vital calves

#### SANOLAC® SPRINT

Acidified milk for intensive rearing

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<th>Skimmed milk powder</th>
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Sanolac® Sprint

- High daily weight gain
- Rapid rennet coagulation in the calf’s stomach
- Healthy and vital calves
## CALF STARTER

**MEGGI MÜSLI®**
Top calf muesli for quality calves

<table>
<thead>
<tr>
<th>Meggi Müsli®</th>
<th>Cereals and maize macerated</th>
<th>Highly digestible source of protein</th>
<th>Apple pomace</th>
<th>Combination of vitamins and active ingredients</th>
<th>Biscuit meal</th>
<th>Linseeds</th>
<th>Brewer’s yeast</th>
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**MEGGI 10®**
The safe calf starter concentrate for quality calves

<table>
<thead>
<tr>
<th>Meggi 10®</th>
<th>Cereals and maize macerated</th>
<th>Highly digestible source of protein</th>
<th>Apple pomace</th>
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**QUICK READ:**

- For intensive calf rearing, the use of milk replacers with skimmed milk powder such as AM18 and Milli M® has proven successful.
- The concentration of the milk replacer should be 160 g per liter of water.

With the rationed drinking method, the calves receive a fixed quantity of cow’s milk or milk replacer daily by hand with the teat bucket or via an automatic feeder. For a functioning oesophageal groove reflex and a good nutrient supply, the concentration of the milk replacer during the entire drinking phase should be 150 to 160 g per liter of water.

**IMPLEMENTATION OF THE RATIONED DRINKING – INTENSIVE CALF REARING**

For intensive calf rearing with high daily weight gain, the use of a milk replacer with skimmed milk powder has proven successful. Studies show a faster development and higher daily weight gain if the calves are also supplied with casein from skimmed milk in addition to whey protein.

In the 2nd and 3rd week of rearing, more diseases of the digestive tract and diarrhea can occur. The administration of probiotics and active ingredients that promote the healing of inflammatory processes can make the calves more resistant and thus effectively protect them from diseases. Feeding a proportion of colostrum even after the first milk phase acts as a defense against bacteria in the digestive tract and thus offers additional protection against infection.

**Sano has developed two milk replacers with skimmed milk for intensive calf rearing:**

- AM18 contains highly digestible protein from 35% skimmed milk powder for high daily weight gain. With lactic acid bacteria as probiotics and the herbal active ingredient SangroSan®, AM18 ensures a healthy digestive tract and better control of inflammation and infections.
- Milli M® contains 20% skimmed milk powder, probiotics, SangroSan® and additionally a proportion of colostrum for improved protection against infection in the digestive tract.

**IMPLEMENTATION OF RATIONED DRINKING – THE BASIS FOR SAFE CALF REARING**

The application of probiotics and active ingredients that promote the healing of inflammatory processes can make the calves more resistant to infections and thus ensure a safe drinking phase. The absorption of finely ground linseeds provides additional protection against bacteria in the digestive tract. To achieve an early solid feed intake, it is helpful to stimulate the calf’s appetite.

Sano has designed two proven milk replacers for simple and safe calf rearing:

- Sanolac LilaCitro® contains sweet whey powder, highly digestible vegetable protein sources and SangroSan® for better control of inflammatory processes. The citric acid contained in Sanolac LilaCitro® lowers the pH value, ensures hygienic watering and supports digestion in the abomasum. This effectively prevents digestive disorders and diarrhea.
- Milsan® is a special combination of sweet whey powder, SangroSan® and linseed flour. The milk replacer is specially designed for calves from the 5th week of life and promotes intestinal health and solid feed intake in equal measure.
The Sano concept for intensive calf rearing and the Sano basic concept for safe calf rearing offer innovative milk replacers for easy handling and good calf development. Functional active ingredients stimulate appetite, promote rumen development and support digestibility. The Sano concepts for intensive and safe calf rearing offer dairy farmers everything that calves need for a conventional calf feeding.
## MILK REPLACER – INTENSIVE

### AM18
**Milk replacer with skimmed milk powder**

<table>
<thead>
<tr>
<th>Skimmed milk powder</th>
<th>Sweet whey powder</th>
<th>Colostrum of the 1st milk</th>
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**AM18**

### MILLI M®
**Calf milk for healthy growth**

| ✔️ | ✔️ | ✔️ | ✔️ | ✔️ | ✔️ | ✔️ | ✔️ |

**Milli M®**

### MILK REPLACER – BASIC

### SANOLAC LILACITRO®
**The milk replacer including acidification**

<table>
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<tr>
<th>Sweet whey powder</th>
<th>Combination of vitamins and active ingredients</th>
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**Sanolac LilaCitro®**

### MILSAN®
**Calf milk for rapid rumen development and safe weaning**

| ✔️ | ✔️ | ✔️ | ✔️ | ✔️ | ✔️ |

**Milsan®**
## CALF STARTER

### MEGGI MÜSLI®
**Top calf muesli for quality calves**

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**Meggi Müsli®**

### MEGGI 10®
**The safe calf starter concentrate for quality calves**

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**Meggi 10®**

## SANO SUCCESS STORY

### HEALTHIER AND STRONGER CALVES
through the use of highly digestible feed

“By using AM18 and Meggi Muesli® we don’t have any more problems.”
Managers Stefan and Theo Densborn

Company profile:
Heidehof GbR
180 Dairy cows
135 female offspring
25 feeders
82 ha pasture
146 ha farmland
RATIONATED DRINKING

RUMEN DEVELOPMENT

The rumen of the newborn calf is still completely non-functional, the rumen surface is almost smooth and thin like a white sheet of paper. In particular, rumen villi and microbial colonization have yet to develop. The intake of concentrated feed is the decisive prerequisite for this.

The development of the rumen depends on three factors:
1. the time of drinking reduction, which in turn influences the intake of solid feed,
2. an early intake of starchy feed (calf starter), which has a stimulating effect on the growth of the rumen villi,
3. the feeding of structurally effective components which stimulate the growth in size and the activity of the rumen by mechanical stimuli.

The proportions of the individual (pre)stomachs also change dramatically. The rumen of the calf takes up only about 25% of the stomach volume. In the adult cow it is about 80%. Particular attention must be paid to the development of the rumen villi during calf rearing. Calves fed with only milk and hay showed almost no rumen villi at the age of 8 weeks. Peer calves, reared with milk, a cereal-rich calf starter ad libitum and rationed hay, had a fully rumen surface with long rumen villi. The development of the rumen villi requires the presence of propionic and butyric acid. Propionic and butyric acid are formed during the digestion of starch (cereals).

The high-quality cereal-rich calf starter is therefore a prerequisite for successful calf rearing with high increases and an optimal development into a ruminant.

Development of rumen villi as a function of the ratio of basic feed (%) to concentrated feed (%)

Sufficient water supply plays a decisive role in calf rearing. Calves in the first week of life already need clean drinking water ad lib, in addition to milk potions in order to cover their liquid requirements. The better the water supply, the more calf starters the calves eat.

Since calves, like all young mammals, still have to “train” their own digestive enzymes for the utilization of plant components such as starch and protein, a calf starter should only contain high-quality components: highly digestible energy components with starch to promote rumen development on the one hand, and protein components that are free of harmful substances and have a high biological value on the other.

CALF STARTER

Sano has developed two calf starters with highly digestible components especially for a good, rapid development of the rumen villi:

▶ Meggi Muesli® is a full-fledged calf muesli that can be fed immediately from the first day of life. The product contains maize, wheat and barley flakes as well as puffed maize to promote the bacteria that form propionic acid. Beet molasses and apple pomace stimulate butyric acid production. Meggi Muesli® thus promotes the growth of the rumen villi. The protein source is steam-heated soy extraction meal from peeled seeds.

▶ Meggi 10® is a calf starter concentrate that is incorporated with 10% into the farm’s own calf starter mixtures (with crushed cereals and soy meal). It contains highly digestible soy protein concentrate, brewer’s yeast, biscuit meal and linseeds in finely ground form as well as highly concentrated amounts of vitamins and trace elements.
THE PERFORMANCE PHASES OF THE YOUNG CATTLE

YOUNG CATTLE REARING 1
1. How can the heifers be equipped with stable buttocks and healthy claws?
2. Which parameters are available to make the rearing of heifers as inexpensive as possible?
3. What conditions must be created in order to achieve a lactation start with high performance and healthy udder?

YOUNG CATTLE REARING 2
1. How can steady growth be achieved?
2. At what age and weight is the optimal time for the first pregnancy?
3. Which parameters are available to make the rearing of young cattle as inexpensive as possible?

YOUNG CATTLE REARING 3
1. How can the heifers be equipped with stable buttocks and healthy claws?
2. Which parameters are available to make the rearing of heifers as inexpensive as possible?
3. What conditions must be created in order to achieve a lactation start with high performance and healthy udder?
PRODUCT OVERVIEW YOUNG CATTLE

Sano is the major European brand for mineral feed, calf milk and specialties for modern animal nutrition. Insure yourself of our young cattle concept with products specially adapted to every phase of life and performance for healthy growth of your animals and successful management on your farm.

SPECIAL YOUNG CATTLE TMR

Young cattle rearing 1, 2, 3

Product description:
Various magnesium sources support enzymatic reactions in energy metabolism. Muscle cramps and nervousness are prevented. The animals are calm, eat more, have lower energy losses and higher daily weight gain. Vitamin E and selenium promote resistance and support the optimal build-up of muscle flesh. The well-dosed vitamin B complex is indispensable for the entire energy and protein metabolism, the function of nerve tissue and heart muscles as well as in young ruminants, especially for maintaining peristalsis in the gastrointestinal tract. This means protection against cerebral cortex necrosis, irritability and cramps.

Product benefits:
▶ Strengthens the immune system and protects against infectious diseases
▶ Promotes metabolism and growth
▶ Supports the natural rumen development
▶ Increases the appetite and boosts feed intake
▶ Promotes udder development and increases heifer performance

Application:
Feed Primasan® with up to 150 g per animal per day to your offspring and bulls.

SUPPLEMENTARY PRODUCTS

<table>
<thead>
<tr>
<th>KRISTALL HFE®</th>
<th>FERTISAN®</th>
<th>LABACSIL®</th>
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<tr>
<td>The rumen power pack for more activity in the rumen</td>
<td>Fertility activator</td>
<td>The Sano silage additives for tasty and high-quality grass and maize silage</td>
</tr>
</tbody>
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LABACSIL®
The effective Sano silage additives for minimized fermentation losses, better feed quality and tasty silages
In the 1st phase of rearing young cattle, the young cattle must achieve high increases and at the same time be kept healthy. The greatest challenges here are the close observation of the development of the animals and the supply of high-quality feed components.

All mistakes made in the 1st rearing phase are at the expense of life performance and metabolic health.

For optimal management in the first phase of rearing young cattle, the following key questions must therefore be answered:

1. How can the heifers be equipped with sturdy buttocks and healthy claws?
2. Which parameters are available to make the rearing of heifers as inexpensive as possible?
3. What conditions must be created in order to achieve a lactation start with high performance and healthy udders?

Your Sano consultant will be happy to help you answer these questions. Following you will find additional information on the nutritional requirements of your future cows and the products of the Sano catalog specially adapted to them.

YOUR GOALS IN THE REARING OF YOUNG CATTLE 1

- High daily weight gain
- Early first insemination
- Optimizing rearing costs
- Healthy animals
KNOWING WHY – WHAT IS IMPORTANT IN THE 1ST PHASE OF REARING YOUNG CATTLE

QUICK READ:
▶ Up to the age of approx. 9 months the future cows should be fed intensively – e.g. with the lactating ration.

In the 1st phase of rearing, the calves are raised intensively. From weaning to the age of 9 months, daily weight gain of at least 900 g must be achieved so that the young cattle develop well, and later have an efficient metabolism as cows that are able to produce a high milk yield.

Good body development and adequate udder growth are particularly important. The udder system is formed between the 3rd and 9th months of life. Intensive feeding in this phase promotes the growth and optimal formation of the udder. When fed too moderately, fat is stored in the udder tissue. This leads to a reduction in milk yield.

The feed for young cattle rearing 1 must smell and taste good, and should be of the best quality and contain many highly digestible ingredients. In this way you ensure healthy animals in the rearing of young cattle. The best quality water must also be available in sufficient quantity for free intake.

A young cow weighing between 100 and 290 kg consumes between 10 and 30 liters of water a day. With a view to the later performance and metabolic health as a dairy cow, intensive rearing in the first phase is a good investment, since costs and later benefits are in the optimum ratio.

It’s that simple:
Feed a high-quality young cattle ration with ≥ 6.7 MJ NEL, ≥ 16% XP and 100 g Sano Young Cattle Mineral.

Sano Feeding Concept
In the 2nd phase of the young cattle rearing, the young cattle must be prepared with medium weight gain for the optimal weight for the first pregnancy. The challenge here is to prevent over-conditioning and to reach the optimum weight at the desired first insemination age.

Any mistakes made in the second stage of rearing, have a negative effect on insemination success and the first calf age.

For an optimal management in the 2nd phase of the young cattle rearing it is therefore necessary to answer the following core questions:

1. How can steady growth be achieved?
2. At what age and weight is the optimal time for the first pregnancy?
3. Which parameters are available to make the rearing of young cattle as inexpensive as possible?

Your Sano consultant will be happy to help you answer these questions. Following you will find additional information on the nutritional requirements of your future cows and the products of the Sano catalog specially adapted to them.

YOUR GOALS IN THE REARING OF YOUNG CATTLE 2

- Early, successful first insemination
- Early first calf age
- Optimizing rearing costs
- Steady growth
In the 2nd phase of the young cattle rearing, the animals are fed somewhat more restrained. At the age of 9 months, the daily weight gain must be reduced to about 750 to 800 g so that the young cattle grow steadily and do not run into over-conditioning. Therefore, the ration in the 2nd phase can be “lighter” and thus also cheaper.

The optimum weight at the time of the first pregnancy is 400 to 420 kg. This applies to Holstein and Brown-Swiss as well as to Fleckvieh cattle. The ideal age for the first pregnancy is about 15 months for Holstein, Fleckvieh and Brown-Swiss, so that the heifers calve at the age of 24 months for the first time.

Whether the animals have developed “according to plan” and have already reached 400 to 420 kg for the first pregnancy, can be determined by weighing or with a weight measuring tape. This check should be carried out regularly and at short intervals in order to be able to react as quickly as possible to feeding errors.

It’s that simple:
Feed a high-quality young cattle ration with 5.8-6.0 MJ NEL, 13-14% XP and 120 g of a Sano Young Cattle Mineral.

"Primasan® provides young cattle with an optimal supply of all active ingredients."
Herd Manager Sabine Burkhardt

Increase of milk yield to over 32 kg per cow per day

Company profile:
Agrargenossenschaft Rannstedt eG
400 dairy cows plus offspring
2.200 ha farmland
Rannstedt, Thüringen
In the 3rd phase of the young cattle, rearing the heifers must be prepared with medium weight gain for the optimal weight for calving and the 1st lactation. The challenge here is to prevent over-conditioning and to achieve the optimum weight for the calving date.

All mistakes made in the 3rd rearing phase are at the expense of the willingness to perform in the first lactation, such as daily milk quantity and fertility.

For optimal management in the 3rd phase of rearing young cattle, the following key questions must therefore be answered:

1. How can the heifers be equipped with sturdy buttocks and healthy claws?
2. Which parameters are available to make the rearing of heifers as inexpensive as possible?
3. What conditions must be created in order to achieve a lactation start with high performance and healthy udder?

Your Sano consultant will be happy to help you answer these questions. Following you will find additional information on the nutritional requirements of your future cows and the products of the Sano catalog specially adapted to them.

**YOUR GOALS IN THE REARING OF YOUNG CATTLE 3**

- Optimizing rearing costs
- Good start to the 1st lactation with healthy udder
- Sturdy buttocks and healthy claws
KNOWING WHY – WHAT IS IMPORTANT IN THE 3RD PHASE OF REARING YOUNG CATTLE

QUICK READ:

- Pregnant young cattle must be fed with the objective of medium weight gain in order to avoid over-conditioning.
- A weight of approx. 600 kg should be aimed for the first calving.

In the 3rd phase of the young cattle, rearing the heifers are further slowed down. Too intensively fed cattle become fat and are susceptible to birth problems, metabolic disorders at the beginning of lactation and fertility disorders. However, the diet should not be restrained either, because animals with a calving weight that is too low have a poorer performance.

The goal is daily weight gain of 650 g to a maximum of 700 g, so that the young animals at the age of 24 months, that calve for the first time, weigh approx. 600 kg. They should receive all components of the TMR of lactating cows to prepare the rumen for the first lactation. It is important to monitor the development of cattle at this stage too.

It’s that simple:
Feed a high-quality young cattle ration with 5.5-5.8 MJ NEL, about 12.5% XP and 150 g of a Sano Young Cattle Mineral.

Young cattle mineral
Besides the feeding concept described above, an adapted supply of minerals, vitamins and trace elements is very important for healthy young livestock reared with good udder development and early calving.

Vitamin E and selenium are very important for promoting resistance and good muscle growth. Polyphenols with tannins from selected plants have proven to be additional antioxidants for the protection of vitamin E. The B vitamins in particular support the energy and protein metabolism of the young animals. These ensure a good development of the young animals. Zinc is also an important factor for the health of hoof, horn and udder tissue.

Primasan®
Sano has developed Primasan® especially for the requirements of young cattle. In addition to highly digestible mineral components for good bone growth, the young cattle mineral also contains a special combination of vitamin E, selenium and a polyphenol complex. A complex of various B vitamins is also used for an efficient metabolism during growth and for the preparation of the first lactation. Primasan® with zinc also supports the healthy development of hooves and udders.

QUICK READ:

- Pregnant young cattle must be fed with the objective of medium weight gain in order to avoid over-conditioning.
- A weight of approx. 600 kg should be aimed for the first calving.
YOUNG CATTLE REARING PHASE 1, 2 AND 3 PRODUCT LINES

PRESENTATION OF THE TMR FOR LACTATION

The labor-saving Sano feeding concept for the young cattle rearing provides that the young cattle are fed in the different phases with mixed rations of the lactating or dry cows. The animals also receive the cow’s mineral or Mipro® contained in the TMR. As a result, smaller and medium-sized farms save time to create additional cattle feed mixes.

SPECIAL YOUNG CATTLE TMR

The tailor-made Sano feeding concept for the rearing of young cattle provides for the young cattle to be fed with special young cattle rations that are precisely adapted to the needs of the animals. Sano has designed the young cattle mineral Primasan® especially for the young cattle TMR. High-quality minerals, vitamins, trace elements and active ingredients promote growth and animal health. The young stock TMR with Primasan® offers everything young cattle need for healthy growth.
### PRESENTATION OF LACTATING TMR FOR YOUNG CATTLE

**Mipro® of lactation – e.g. Mipro M 500®**  
The Sano complete solution with best rumen performance for lactating cows

<table>
<thead>
<tr>
<th>Minerals, vitamins, trace elements</th>
<th>Live yeast</th>
<th>Sugars</th>
<th>Nitrogen compounds</th>
<th>Rumen-protected methionine</th>
<th>Product benefits</th>
</tr>
</thead>
</table>
| ![Mipro®](image) | ✓ | ✓ | ✓ | ✓ | ▶ Early first calf age  
▶ Healthy udder  
▶ Sturdy claws  
▶ Low rearing costs |

**Mineral feed of lactation – e.g. Profisan®**  
The Sano Mineral Complex for dairy cows with very high performance

<table>
<thead>
<tr>
<th>Mineral feed e.g. Profisan®</th>
<th>Mastitisan®, Kerasan®, choline, vitamin C, partially organically bound trace elements</th>
<th><img src="image" alt="Mineral feed" /></th>
<th><img src="image" alt="Mineral feed" /></th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Mineral feed" /></td>
<td><img src="image" alt="Mineral feed" /></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SPECIAL YOUNG CATTLE TMR**

**Primasan®**  
The Sano Mineral Complex for a good development in young cattle

<table>
<thead>
<tr>
<th>Highly digestible minerals</th>
<th>Various magnesium sources</th>
<th>Vitamin E and selenium</th>
<th>Vitamin B complex</th>
<th>Zinc</th>
<th>Sulphur</th>
<th>Product benefits</th>
</tr>
</thead>
</table>
| ![Primasan®](image) | ![Primasan®](image) | ![Primasan®](image) | ![Primasan®](image) | ![Primasan®](image) | ![Primasan®](image) | ▶ Early first calf age  
▶ Healthy udder  
▶ Sturdy claws  
▶ Low rearing costs |
## SAMPLE RATIONS FOR CALF AND YOUNG CATTLE

### Meggi 10° – THE SAFE CALF STARTER CONCENTRATE FOR QUALITY CALVES

<table>
<thead>
<tr>
<th>Dry calf TMR</th>
<th>With alfalfa hay</th>
<th>Without alfalfa hay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alfalfa hay</td>
<td>15%</td>
<td>–</td>
</tr>
<tr>
<td>Straw/hay</td>
<td>5%</td>
<td>20%</td>
</tr>
<tr>
<td>Energy concentrates</td>
<td>51.5%</td>
<td>46%</td>
</tr>
<tr>
<td>Protein concentrates</td>
<td>16%</td>
<td>21.5%</td>
</tr>
<tr>
<td>Oil</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Molasses</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td>Meggi 10° (*)</td>
<td>7.5%</td>
<td>7.5%</td>
</tr>
</tbody>
</table>

(*) Application quantity: 10% in concentrated feed

### Primasan® – THE SANO MINERAL COMPLEX FOR A GOOD DEVELOPMENT FOR YOUNG CATTLE

<table>
<thead>
<tr>
<th>Calf TMR</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Maize silage</td>
<td>43%</td>
</tr>
<tr>
<td>Straw/hay</td>
<td>8%</td>
</tr>
<tr>
<td>Energy concentrates</td>
<td>34%</td>
</tr>
<tr>
<td>Protein concentrates</td>
<td>13%</td>
</tr>
<tr>
<td>Primasan®</td>
<td>2%</td>
</tr>
</tbody>
</table>
PRODUCTS FOR CALVES

SANO MILK REPLACERS, SUPPLEMENTS AND ADDITIVES – FOR THE BEST POSSIBLE SUPPLY OF FEED WITH NUTRIENTS AND ACTIVE SUBSTANCES OF HIGH QUALITY

<table>
<thead>
<tr>
<th>Colostrum phase</th>
<th>Drinking phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>COTOSAN PLUS®</td>
<td>LATTECINO®</td>
</tr>
<tr>
<td>The colostrum supplement for healthy and resistant calves</td>
<td>Makes cow's milk valuable and promotes resistance</td>
</tr>
<tr>
<td>SANOLAC® STARTINO®</td>
<td>SANOLAC SPRINT</td>
</tr>
<tr>
<td>Calf milk for the metabolic sprint</td>
<td>Acidified milk for intensive rearing</td>
</tr>
<tr>
<td>MILSAN®</td>
<td>SANOLAC LILACITRO®</td>
</tr>
<tr>
<td>Calf milk for rapid rumen development and safe weaning</td>
<td>The milk replacer including acidification</td>
</tr>
<tr>
<td>MEGGI MÜSLI®</td>
<td>MEGGI 10®</td>
</tr>
<tr>
<td>Top calf muesli for quality calves</td>
<td>The safe calf starter concentrate for quality calves</td>
</tr>
<tr>
<td>MEKKI MÜSLI®</td>
<td>MEKKI 10®</td>
</tr>
<tr>
<td>Sano calf starter for best rumen development</td>
<td>The safe calf starter concentrate for quality calves</td>
</tr>
<tr>
<td>SUPPLEMENTARY PRODUCTS</td>
<td></td>
</tr>
<tr>
<td>ACIDOSAN®</td>
<td>SANOLYTE®</td>
</tr>
<tr>
<td>Makes calf's milk durable and protects against diarrhea</td>
<td>Best electrolyte supplement for calf diarrhea</td>
</tr>
<tr>
<td>ANTILAXAN®</td>
<td>SANOLYTE®</td>
</tr>
<tr>
<td>The active ingredient combination against calf diarrhea</td>
<td>Best electrolyte supplement for calf diarrhea</td>
</tr>
</tbody>
</table>

PRODUCTS FOR YOUNG CATTLE

SPECIAL YOUNG CATTLE TMR

Young cattle rearing 1, 2, 3

PRIMASAN®
The Sano Mineral Complex for a good development in young cattle

SUPPLEMENTARY PRODUCTS

Young cattle rearing 1, 2, 3

KRISTALL HFE®
The rumen power pack for more life in the rumen
| FERTISAN® | LABACSL® |
| Fertility activator | Sano silage additives for tasty and high-quality grass and maize silage |
# PRODUCTS FOR DAIRY COWS

## SANO MIPRO® – THE COMPLETE SOLUTION FOR MINERAL FEEDS WITH FUNCTIONAL PROPERTIES FOR MIXED RATION WITH BEST RUMEN PERFORMANCE

<table>
<thead>
<tr>
<th>Dry period</th>
<th>Birth</th>
<th>Lactation</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIPRO PREN 250®</td>
<td>BOVIFIT SC®</td>
<td>MIPRO NU 350®</td>
</tr>
<tr>
<td>Prevention of milk fever for dry cows</td>
<td>The fitness drink after calving</td>
<td>For partial TMR with &gt; 60% grass</td>
</tr>
<tr>
<td>MIPRO PREN 400®</td>
<td>BOVIFIT SC®</td>
<td>MIPRO T 350®</td>
</tr>
<tr>
<td>Milk fever prophylaxis and best fiber utilization for dry cows</td>
<td>The fitness drink after calving</td>
<td>For partial TMR with ≥ 50% maize</td>
</tr>
</tbody>
</table>

## SANO MINERAL FEED – FOR THE BEST POSSIBLE SUPPLY OF FEED WITH MINERALS AND ACTIVE INGREDIENTS OF HIGH QUALITY

<table>
<thead>
<tr>
<th>Dry period</th>
<th>Birth</th>
<th>Lactation</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRENATA50®</td>
<td>BOVIFIT SC®</td>
<td>MIPRO NU 500®</td>
</tr>
<tr>
<td>The TMR dry cow supplement</td>
<td>The fitness drink after calving</td>
<td>For full TMR with &gt; 60% grass</td>
</tr>
<tr>
<td>PROFISAN®</td>
<td>BOVIFIT SC®</td>
<td>MIPRO M 500®</td>
</tr>
<tr>
<td>For dairy cows with a very high performance level</td>
<td>The fitness drink after calving</td>
<td>For full TMR with ≥ 50% maize</td>
</tr>
<tr>
<td>TOPSAN®</td>
<td></td>
<td>MIPRO HP 600®</td>
</tr>
<tr>
<td>For dairy cows at the highest performance level</td>
<td></td>
<td>For full TMR with ≥ 50% maize</td>
</tr>
</tbody>
</table>

## SUPPLEMENTARY PRODUCTS

<table>
<thead>
<tr>
<th>Dry period</th>
<th>Birth</th>
<th>Lactation</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEXTROFAT RAPS, DEXTROFAT PROTECT®</td>
<td>STIMUDIGEST®</td>
<td>DEXTRAFAT® RAPS, DEXTROFAT PROTECT®</td>
</tr>
<tr>
<td>Highly concentrated energy for cows</td>
<td>The appetite stimulator for rumen stimulation and metabolic activation</td>
<td>Highly concentrated energy for cows</td>
</tr>
<tr>
<td>MULTISAN NEKTAR®</td>
<td>FERTISAN®</td>
<td>MULTISAN NEKTAR®</td>
</tr>
<tr>
<td>Subar cocktail component for rumen synchronization and optimization of rumen metabolism</td>
<td>Fertility activator</td>
<td>Subar cocktail component for rumen synchronization and optimization of rumen metabolism</td>
</tr>
<tr>
<td>LABACSIL®</td>
<td>KRISTALL HEFE®</td>
<td>LABACSIL®</td>
</tr>
<tr>
<td>For tasty grass and maize silages</td>
<td>The rumen power pack for more life in the rumen</td>
<td>For tasty grass and maize silages</td>
</tr>
</tbody>
</table>

## Sano Feeding Concept
# PRODUCTS FOR BEEF CATTLE

## SANO MILK REPLACERS, SUPPLEMENTS AND ADDITIVES – FOR THE BEST POSSIBLE SUPPLY OF FEED WITH NUTRIENTS AND ACTIVE INGREDIENTS OF HIGH QUALITY

### Drinking phase

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM18</td>
<td>Thick and creamy milk with skimmed milk powder</td>
</tr>
<tr>
<td>MILLI M*</td>
<td>Colostrum milk for the first weeks of life</td>
</tr>
<tr>
<td>MILSAN®</td>
<td>Calf milk for rapid rumen development and safe weaning</td>
</tr>
<tr>
<td>SANOLAC LILACITRO®</td>
<td>The highly soluble milk with acid combination</td>
</tr>
<tr>
<td>MEGGI MÜSLI®</td>
<td>Top calf muesli for quality calves</td>
</tr>
<tr>
<td>MEGGI 10®</td>
<td>The safe calf starter concentrate for quality calves</td>
</tr>
</tbody>
</table>

## SANO MIPRO® – THE COMPLETE SOLUTION FOR MINERAL FEEDS WITH FUNCTIONAL PROPERTIES FOR MIXED RATION WITH BEST RUMEN PERFORMANCE

### Starting phase

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIPROBULL 250®</td>
<td>The Sano nutrient complex with best rumen performance for bull fattening TMR</td>
</tr>
<tr>
<td>MEGGI 10®</td>
<td>The safe calf starter concentrate for quality calves</td>
</tr>
</tbody>
</table>

### Bull fattening

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIPROBULL 250®</td>
<td>The Sano nutrient complex with best rumen performance for bull fattening TMR</td>
</tr>
</tbody>
</table>

## SANO MINERAL FEED – FOR THE BEST POSSIBLE SUPPLY OF FEED WITH MINERAL AND ACTIVE SUBSTANCES OF HIGH QUALITY

### Starting phase

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BULLY®</td>
<td>For resistant bull fattening with best weight gain</td>
</tr>
<tr>
<td>BUMISAN®</td>
<td>For resistant bull fattening with good weight gain</td>
</tr>
<tr>
<td>MEGGI 10®</td>
<td>The safe calf starter concentrate for quality calves</td>
</tr>
</tbody>
</table>

### Bull fattening

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
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<td>For resistant bull fattening with best weight gain</td>
</tr>
<tr>
<td>BUMISAN®</td>
<td>For resistant bull fattening with good weight gain</td>
</tr>
</tbody>
</table>

## SUPPLEMENTARY PRODUCTS

### Drinking phase

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACIDOSAN®</td>
<td>Makes calf’s milk durable and protects against diarrhea</td>
</tr>
<tr>
<td>SANOLYTE®</td>
<td>Best electrolyte supply for calf diarrhea</td>
</tr>
<tr>
<td>KRISTALL HEFE®</td>
<td>The rumen power pack for an ideal rumen environment and better nutrient utilization</td>
</tr>
<tr>
<td>MULTISAN NEKTAR®</td>
<td>Sugar cocktail component for rumen synchronization and optimization of the utilization of fibers and nitrogen</td>
</tr>
</tbody>
</table>

### Starting phase

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTIAXLAX®</td>
<td>The active ingredient combination against calf diarrhea</td>
</tr>
<tr>
<td>LABACSIL®</td>
<td>Sano silage additives for tasty and high-quality grass and maize silage</td>
</tr>
</tbody>
</table>

### Bull fattening

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LABACSIL®</td>
<td>Sano silage additives for tasty and high-quality grass and maize silage</td>
</tr>
</tbody>
</table>
THE MOST IMPORTANT KEY FIGURES FOR EFFICIENT REARING OF FUTURE DAIRY COWS

### KEY FIGURES FOR CALVES

<table>
<thead>
<tr>
<th></th>
<th>Ad libitum</th>
<th>Intensive</th>
<th>Basic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drinking time</td>
<td>10 weeks</td>
<td>10 weeks</td>
<td>10 weeks</td>
</tr>
<tr>
<td>Daily weight gain</td>
<td>&gt;950 g</td>
<td>&gt;850 g</td>
<td>&gt;750 g</td>
</tr>
<tr>
<td>Losses during drinking phase</td>
<td>&lt;5%</td>
<td>&lt;5%</td>
<td>&lt;5%</td>
</tr>
<tr>
<td>First calf age</td>
<td>&lt;24 months</td>
<td>24 to 26 months</td>
<td>&gt;26 months</td>
</tr>
</tbody>
</table>

Doubling birth weight in 60 days

### KEY FIGURES FOR YOUNG CATTLE

<table>
<thead>
<tr>
<th></th>
<th>Double purpose breeds</th>
<th>Dairy breeds</th>
</tr>
</thead>
<tbody>
<tr>
<td>First calf age</td>
<td>ca. 24 months</td>
<td>ca. 24 months</td>
</tr>
<tr>
<td>Weight for calving</td>
<td>600 kg</td>
<td>600 kg</td>
</tr>
<tr>
<td>Weight at 1st insemination</td>
<td>&gt;400 kg</td>
<td>&gt;400 kg</td>
</tr>
<tr>
<td>Insemination index</td>
<td>&lt;1.3</td>
<td>&lt;1.3</td>
</tr>
</tbody>
</table>

SUCCESSFUL CALF FEEDING FOR FUTURE COWS
FOR A BETTER DEVELOPMENT OF CALVES – WITH THE SANO CONSULTING CONCEPT

The Sano consulting concept combines the farmer, the farm veterinarian and the Sano feeding consultant. The focus is on the animal; as economic success is only possible with healthy animals. That is why an intensive cooperation with your farm veterinarian is an essential success factor of the Sano consulting concept. The Sano consulting concept defines seven steps for your operating success.

These are the advantages of the Sano consulting concept:

- Common definition of your operational goals
- Feeding concept specially adapted to your farm
- Regular controlling and adaptation of the feeding concept
- Continuous analysis of the goals achieved

IF YOU ARE INTERESTED IN A SANO FEEDING CONSULTATION, PLEASE CONTACT YOUR SANO EXPERT CONSULTANT.
FOR AN APPOINTMENT ENQUIRY PLEASE SEND US AN E-MAIL TO INFO@SANO.DE

You also benefit from our know-how and can be advised by our expert consultants from your region in a non-binding individual business interview.