



Sprayfo Calf rearing solutions

For the best start in life



LIFESTART
SETS LIFE PERFORMANCE

 **trouw nutrition**
a Nutreco company



The first months in a calf's life are crucial in growing a highly productive dairy cow. It's a period that presents several challenges for dairy farmers.

Science-based solutions for optimum dairy performance

Science is a key driver in helping our customers run a more cost-effective and sustainable farming business. Trouw Nutrition has six animal research centres located throughout the world, an ingredient research centre and 50 long-term research collaborations with leading universities, research institutes and other organisations. We turn the scientific insights gained into innovative solutions that match the needs of farmers and their livestock.

Increasing average lifetime daily production

To continue to feed the ever-increasing world population in a sustainable way^{1,2,3}, we need to utilise the full potential of each production animal. For dairy cows, this means increasing the performance per day of life and in turn, the average lifetime daily production by:

- Reducing the age at first calving
- Increasing milk production per lactation
- Increasing the number of lactations per cow





**Giving your calves
the best start in life**

Scientific proof for a highly predictable calf health and performance





LIFESTART[®]
SETS LIFE PERFORMANCE

LifeStart

LifeStart is a science-based platform that deals with the critical period in the first months of life. It offers the science required to unleash the full potential of dairy cows. Research trials show that by applying LifeStart scientific principles and feeding schedules, farmers benefit from:

- Higher average daily weight gain. Trials have shown up to 300 grams extra growth per day during the pre-weaning phase^{4,5}
- Earlier breeding^{6,7,8}
- Support for healthy udder development. Trials have shown an increase in basic udder development of up to 100%^{5,9,10,11}
- Higher milk production. Trials have shown an increase of up to 400 litres of milk production in the first lactation^{7,8,12,13,14,15}
- Their cows maintaining body condition score during peak production
- A reduction in culling¹⁶

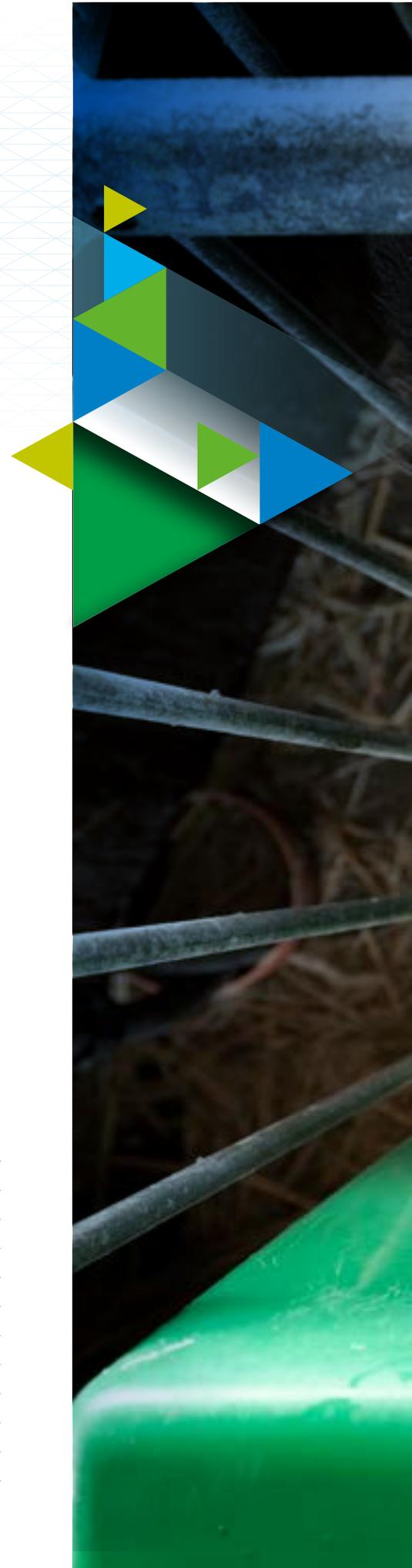
Maintaining health and improving performance stage by stage

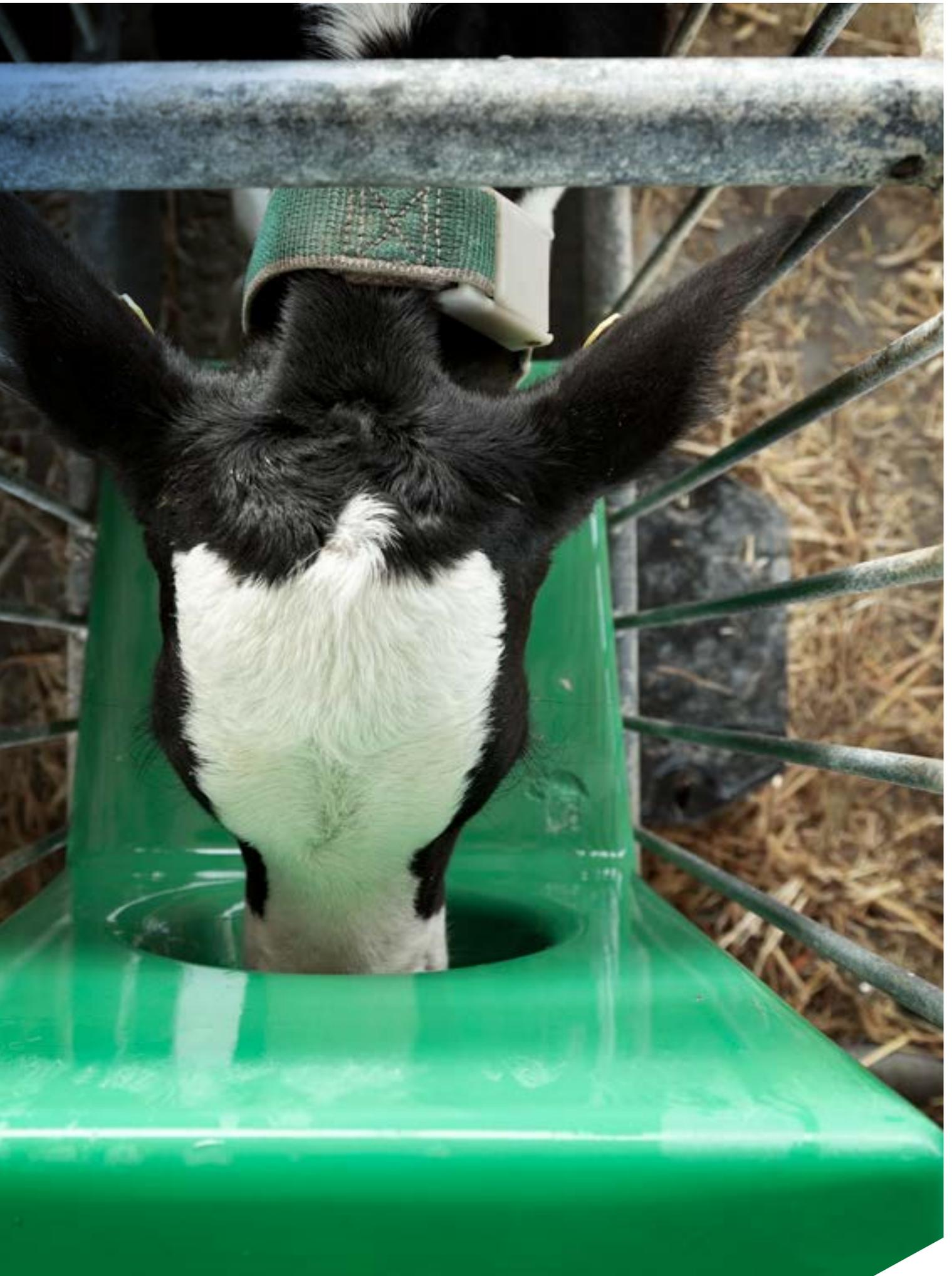
Supported by LifeStart science, Sprayfo offers a complete range of calf-rearing solutions that ensure optimum development during the early stages of life and help to maintain a robust, healthy calf that is ready for high milk production. This allows farmers to produce more milk with fewer cows and to reduce the amount of young stock.

Calf rearing objectives

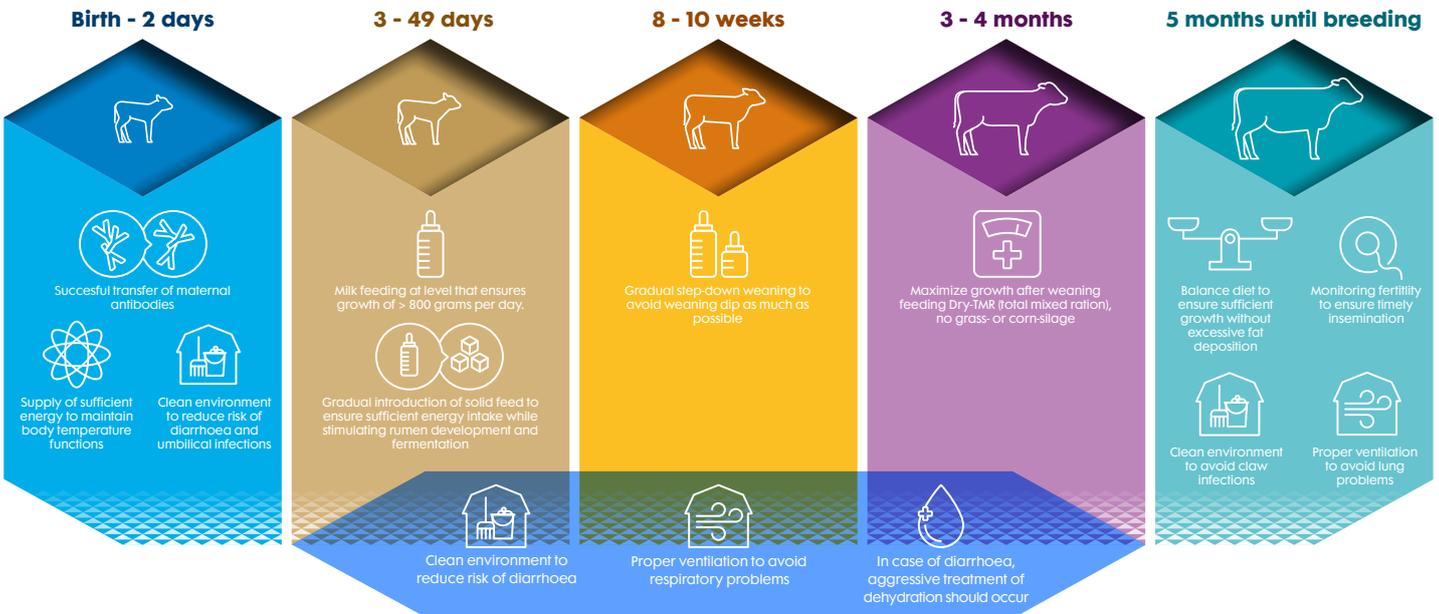
Sprayfo enables you to meet the following rearing objectives:

	Jersey	Cross-bred	Holstein Frisian
Fully grown body weight	450 kg	550 kg	700 kg
Weight at birth	26 kg	32 kg	40 kg
Low mortality rate	< 5%	< 5%	< 5%
Low incidence of diarrhoea	< 10%	< 10%	< 10%
Low incidence of lung problems	< 10%	< 10%	< 10%
Weaning weight at 10 weeks of age	65 kg	80 kg	100kg
Weight at 4 months of age	100 kg	125 kg	155 kg
Insemination weight	275-300 kg	325-350 kg	400-425 kg
Insemination age	From 13 months	From 13 months	From 13 months
Weight after first calving	390-415 kg	475-500 kg	600-625 kg
Calving age	From 22 months	From 22 months	From 22 months





Excellent calf rearing at every stage of life



◆ Day 0-2; the start-up phase

In the first two days of life, you have to ensure the calf receives sufficient antibodies from colostrum. You also need to supply enough energy to maintain the calf's body temperature functions. The first calf feeding is all about speed, colostrum quality, volume and temperature. Colostrum quality is the most important of these qualifiers and can be influenced in various ways. One way is to measure colostrum quality before feeding and to replace poor quality colostrum with colostrum from a different cow, or to enrich the quality by adding a colostrum replacer. An alternative method is to improve the feeding strategy of the dam during the close-up phase to ensure the colostrum volume produced on the day of calving is around 10 litres. Lastly, colostrum quality can be improved by vaccinating dams against pathogens associated with calf diarrhoea. A refractometer is an excellent tool for measuring colostrum quality before calf feeding takes place. Sprayfo colostrum management and feeding protocols are available to optimise colostrum feeding to your calves.

◆ Day 3-49; the metabolic phase

After three days, the calf has to be fed sufficient milk in order to achieve optimum growth and develop a healthy digestive tract and immune system. This phase is highly important to achieve the optimum metabolic development of calves. You also have to gradually introduce solid feed to ensure optimum energy intake while stimulating rumen development and fermentation. Aim for a daily gain of at least 800 grams per day. To achieve this, milk feeding should be conducted as follows:

- 2–3 milk feedings per day
- 7–8 litres milk per day
- Ensure the calf is fed around 1.2 kg dry milk solids per day at peak level
- Gradual weaning from 8–10 weeks of age

◆ Week 8-10; the weaning phase

Intensive milk feeding programs require time for good rumen development. You should therefore reduce and finally stop milk feeding over a period of 3-4 weeks. Do not wean earlier than 10 weeks of age.



Step-down weaning improves weaning performance. Offering clean, fresh water ad-libitum is essential and forage plays a key role in rumen development and health.

To prepare for weaning at 10 weeks, start to reduce milk intake gradually from 7-8 weeks onwards. To avoid a weaning dip, only feed milk once a day during the last week before weaning. Avoid other stressful procedures such as de-budding, moving animals, changing solid feed etc. around the time of weaning. Sprayfo protocols for avoiding a weaning dip are available.

◆ 3 - 4 months; the efficient growth phase

To maximise post-weaning growth, the calf should be fed with compound feed in combination with straw or with a dry TMR.

◆ 5 months-breeding; the balancing phase

After reaching the age of 5 months, a balanced diet should be fed to ensure sufficient growth without excessive fat deposition. During this period, the calf is being fed crib feed and roughage. If sufficiently developed, inseminations will take place from an age of 13 months onwards.

Management of health

Throughout all these stages, you need to ensure a clean environment to reduce the risk of diarrhoea and other infections. Proper ventilation is also required to avoid respiratory problems.

Managing gut health

Scours is responsible for over half of neonatal calf deaths. In addition, it results in poor growth and poor performance, and a lot of work for the farmer. Prevention is better than cure, and a lot can be done to prevent diarrhoea on a dairy farm. Protocols for preventing diarrhoea and managing cryptosporidium are available.

Managing the respiratory system

Respiratory problems can be seen in calves at 4 weeks of age and older. Even if calves recover from an outbreak, there's often permanent damage to the lungs, preventing the calf from developing into a highly productive milking cow later in life. To keep the respiratory system healthy, early recognition and a prevention program are important. A protocol for optimising respiratory health is available.

Sprayfo products

Sprayfo Calf Milk Replacers

Cow-milk-derived ingredients vary considerably in quality. Sprayfo products contain ingredients of the highest quality. A crucial breakthrough was the invention of our spray-drying technique. Combined with unique fat kernels based on 25 years of research, this enables Trouw Nutrition to produce calf milk replacers with the correct particle size that are always easy to dissolve.

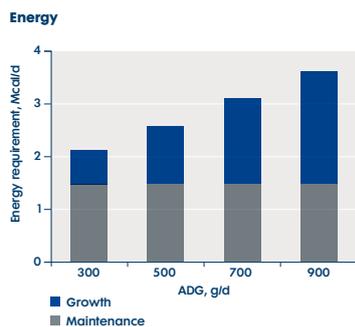
Sprayfo Delta – our flagship product

Sprayfo Delta is inspired by saleable milk as the biological nutritional reference that provides compositional consistency to every calf. It has been specifically formulated for elevated levels of nutrition, so that farmers can sell their milk knowing that every calf is getting the best possible start in life. Compared to other calf milk replacers, it has a lower osmolality and a balanced mineral composition to meet calf requirements. This results in optimum organ development, especially of the mammary gland, leading to the best possible performance in the pre-weaning phase, longevity and optimum lifetime daily production. This gives farmers peace of mind, knowing that every calf is getting the best start in life.





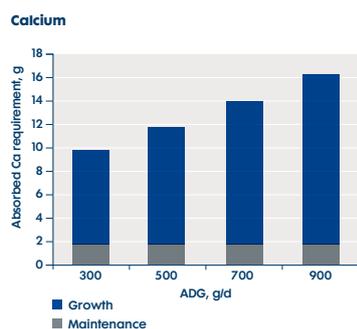
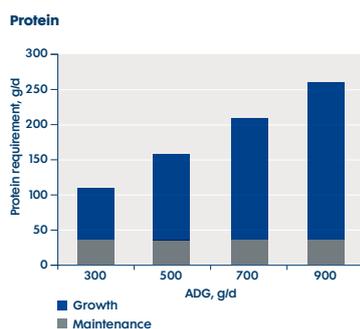
The 3 reasons to use Sprayfo Delta compared to CMR:



1. Balanced to meet nutritional requirements that change with growth rates

Not all current formulations of CMRs are optimal for feeding at a higher plane of nutrition level. Calves could be underfed certain nutrients, and overfed others.

To meet the requirements of calves fed on a LifeStart schedule, we have reformulated Sprayfo Delta to offer a correct balance of minerals and trace elements.

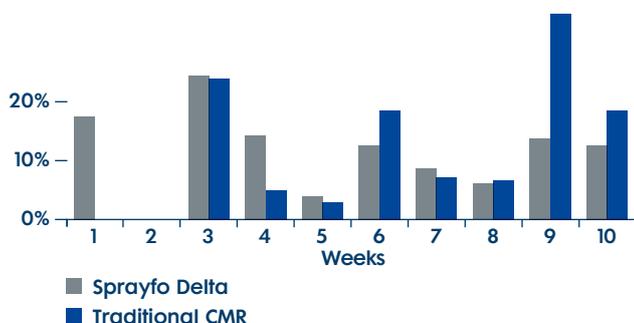




2. Feed for performance, not just growth

Feeding calves a higher plane of quality nutrition will lead to a higher rate of growth. However, Sprayfo Delta has been specifically formulated to ensure that the calf receives a balanced nutrient supply that provides optimum development whilst supporting the health of the calf.

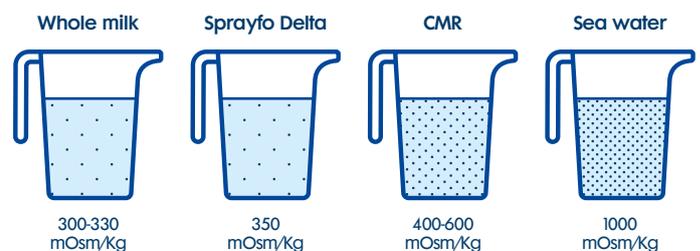
Faecal scores in week 1 - 10



A study was carried out to compare Sprayfo Delta with a traditional CMR. In this study, both treatments had the same level of protein and results showed significant differences in week 1 and 9 for faecal scores, when comparing ECM with a traditional CMR.

3. Feed a product with the correct osmolality

Osmolality is a parameter that measures the concentration of solute particles in a solution and is calculated by adding the concentrations of sugars and minerals in mOsm/kg of solvent. If the osmolality between two body compartments is different, water will flow from the compartment with the lowest osmolality to the compartment with the highest osmolality. So if feed has a high osmolality, water will move from the body tissues into the gut. The lactose content in CMR is the main contributor to the osmolality value. Sprayfo Delta was developed with a low level of lactose, reducing the osmolality of the product by 20%.



With an osmolality of 350 mOsm/L, Sprayfo Delta is the closest alternative to the 330 mOsm/L in cow's milk.

The 3 reasons to use Sprayfo Delta compared to whole milk:



1. Increases the amount of saleable milk

With LifeStart feeding schedules, the average lifetime daily production will go up by:

- Reducing the age at first calving
- Increasing the number of lactations per cow
- Increasing milk production per lactation

The introduction of Sprayfo Delta on your farm allows you to maximise profits by selling 100% of your saleable milk.

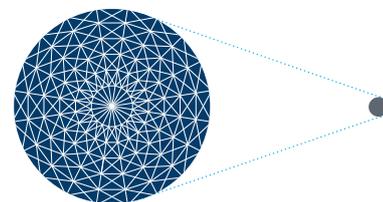


2. Predictability through consistent quality

The raw materials for Sprayfo Delta are produced in The Netherlands, where the process begins by mixing the fresh dairy ingredients with vegetable oils and fats. This mix is high-pressure homogenised and spray-dried, utilising advanced technology. This results in miniscule fat globules of uniform size, similar to the small fat molecules in cow's milk.

Homogenization

Creates an optimal fat globule size, similar to cows' milk, for improved solubility and stability in solution.



Reduction from 20 to 2 micron

Encapsulation

The micronised fat globules are encapsulated with dairy products to improve absorption and increase intake.





3. Biosecurity and the high cost of disease

Whole milk feeding carries the risk of disease transmission, particularly of Johne's disease¹⁸. Feeding a calf milk replacer reduces the risk of indirect contact between dam and calf, reducing the risk of transmission. Sprayfo Delta undergoes a double pasteurisation step; as a result it's free of Johne's disease bacteria.



A broad portfolio for individual needs



Sprayfo Royal

With its excellent quality and 50% milk powder content, Sprayfo Royal is a front-ranking product in the market. It's very suitable for elevating concentrations to the highest level: up to 160 grams per litre of milk. Sprayfo Royal contributes to problem-free feeding; calves drink it enthusiastically and will perform well. It's an ideal product for realising the benefits of the LifeStart program.

Sprayfo Excellent

Sprayfo Excellent is a high-quality calf milk replacer for dairy farmers who demand a lot from their calf rearing. With Sprayfo Excellent you can elevate concentrations to a high level: up to 150 grams per litre of milk. The results are clearly evident in the development and performance of your calves. Sprayfo Excellent is a perfect fit for a LifeStart feeding schedule.



Sprayfo Yellow

Sprayfo Yellow is for dairy farmers who want a trusted formula. It's easily dissolvable and stays stable in solution. With the right concentration and following the correct feeding plan, Sprayfo Yellow is suitable for the LifeStart program. As a result, any farmer can enter the professional ranks of calf rearing.



Sprayfo Blue

Sprayfo Blue is an internationally renowned product. It provides a well-balanced blend for proper calf rearing. Sprayfo blue is based on unique spray-dried, whey-fat kernels. By following the Sprayfo feeding and mixing guidelines, your calves will develop well in the first few months of life.



Sprayfo animal health products



Sprayfo OsmoFit

Sprayfo OsmoFit is a product to stabilise the water and electrolyte balance of calves with diarrhoea. It is a unique dietetic feed product that combines low, correct osmolality¹⁹ with the right amounts and ratios of electrolytes, salts and sugars²⁰, minimising the impact on growth and future performance of your calves.

Sprayfo HydraFit

To hydrate animals exposed to stressful situations, the use of products designed to stabilise the water and electrolyte balance of calves with diarrhoea is to be avoided. Sprayfo HydraFit is formulated according to the specific water and electrolyte needs of calves, in particular after transport²¹. It supports calves' health and offers an additional assurance of minimal calf losses, contributing to a good start to their productive lives. Supplementation with Sprayfo HydraFit prevents unnecessary costs, saves time and reduces labour.



Sprayfo Colostrum

Colostrum from the mother is the best option since it contains farm-specific antibodies. But it's not always possible to obtain colostrum of optimum quality from each cow. Avoid colostrum from cows:

- That are suffering from disease
- After a dry cow period shorter than 3-4 weeks
- After leakage of large quantities of colostrum before calving
- If the yield is more than 10 litres of colostrum at their first milking
- If the colostrum contains clots or antibiotics

Sprayfo Colostrum is a colostrum supplement, based on colostrum from cows vaccinated against the most important calf diseases. It contains at least 20% IgG, which is considered to be the most important antibody for young calves.

It can be used to enrich the quality of colostrum or as a colostrum replacer.



References

- 1 Van Laar et al., 2004
- 2 Van Straalen, 2006
- 3 CRV data, 2010
- 4 Bolt, 2019
- 5 Soberon and Van Amburgh, 2017
- 6 Data on file, study report R06201B
- 7 Bar-Peled et al., 1998
- 8 Raeth-Knight et al., 2009
- 9 Brown et al., 2005
- 10 Geiger et al., 2016
- 11 Hare et al., 2019
- 12 Drackley et al., 2007
- 13 Davis-Rincker et al. 2011
- 14 Soberon et al., 2012
- 15 Soberon et al., 2013
- 16 Data on file, study report R06201B
- 17 Amado et al., 2019
- 18 Barrett et al, 2004
- 19 Wilms et al, 2018
- 20 Wilms et al, 2019
- 21 de Carvalho and Martin-Tereso., 2017



Sprayfo

Calf rearing solutions



Protocols and leaflets

Sprayfo colostrum protocol

An 8-step protocol to ensure that only colostrum of sufficient quality is used and that it's fed according to current standards, ensuring an optimum start in life for each calf.

Sprayfo weaning protocol

This protocol ensures a gradual weaning process, minimizing stress and any negative impact on health and growth.

“Managing dehydration” protocol

A protocol to help you manage calves with diarrhoea so that the impact of dehydration on growth and health is as low as possible.

“Controlling cryptosporidium” protocol

This protocol helps you manage calves in such a way that cryptosporidium levels are low.

“Easy breathing” protocol

A protocol to help you improve ventilation, manage stress, optimise nutrition and ensure respiratory health.

“Johne’s diseases explained” leaflet

This protocol helps you keep the impact of Johne’s disease to a minimum.

“Osmolality explained” leaflet

It’s crucial that Calf Milk Replacers and rehydration products are formulated with the correct osmolality. The “Osmolality explained” leaflet shows why this is so important.





**For more information
about Sprayfo visit:**
www.sprayfo.com



Sprayfo is a brand of Trouw Nutrition, a global leader in animal nutrition, specialising in the development of innovative feed technologies, premixes and unique software solutions. Quality, innovation and sustainability are the guiding principles behind what we do – from research and raw material procurement, to the delivery of cutting-edge products and services designed to increase animal production efficiencies.