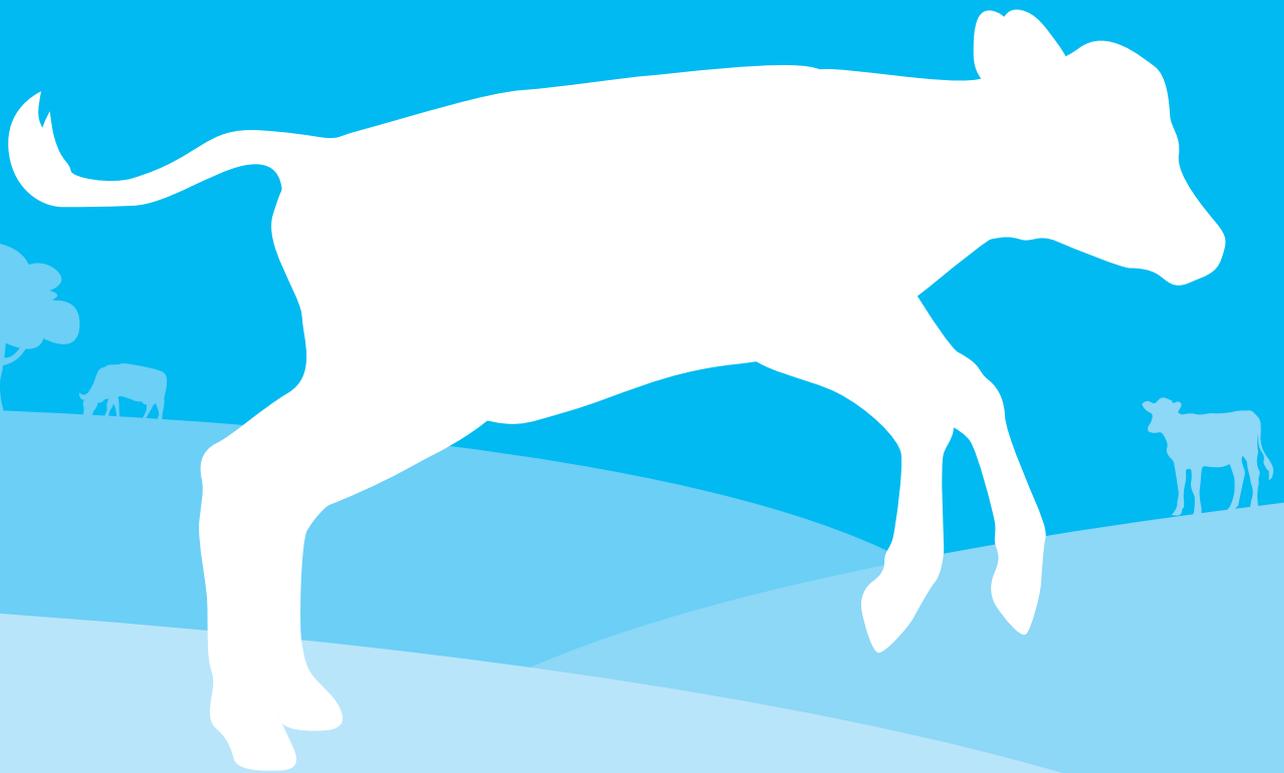


GROW BETTER CALVES

2020
/2021



AgriVantage
PROVEN ANIMAL NUTRITION
A division of Chemiplas (NZ) Ltd

The first 8 weeks will make all the difference

Growth in the first 8 weeks (pre-weaning) is essential for making the most of a calf's full genetic potential.

We've developed this guide around the needs of your newborn calves.

- ✓ Helping you to understand the importance of feeding quality colostrum
- ✓ Choosing the right milk replacer to:
 - optimise growth
 - ensure animals are good milk or meat producers in the future
- ✓ Boosting the digestive system during periods of stress to prevent disease
- ✓ Preventing the growth of bacteria in housing to prevent disease

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Nutrition in the first 8 weeks for beef animals

How you rear your calves will have a major impact on the future productivity of those animals.

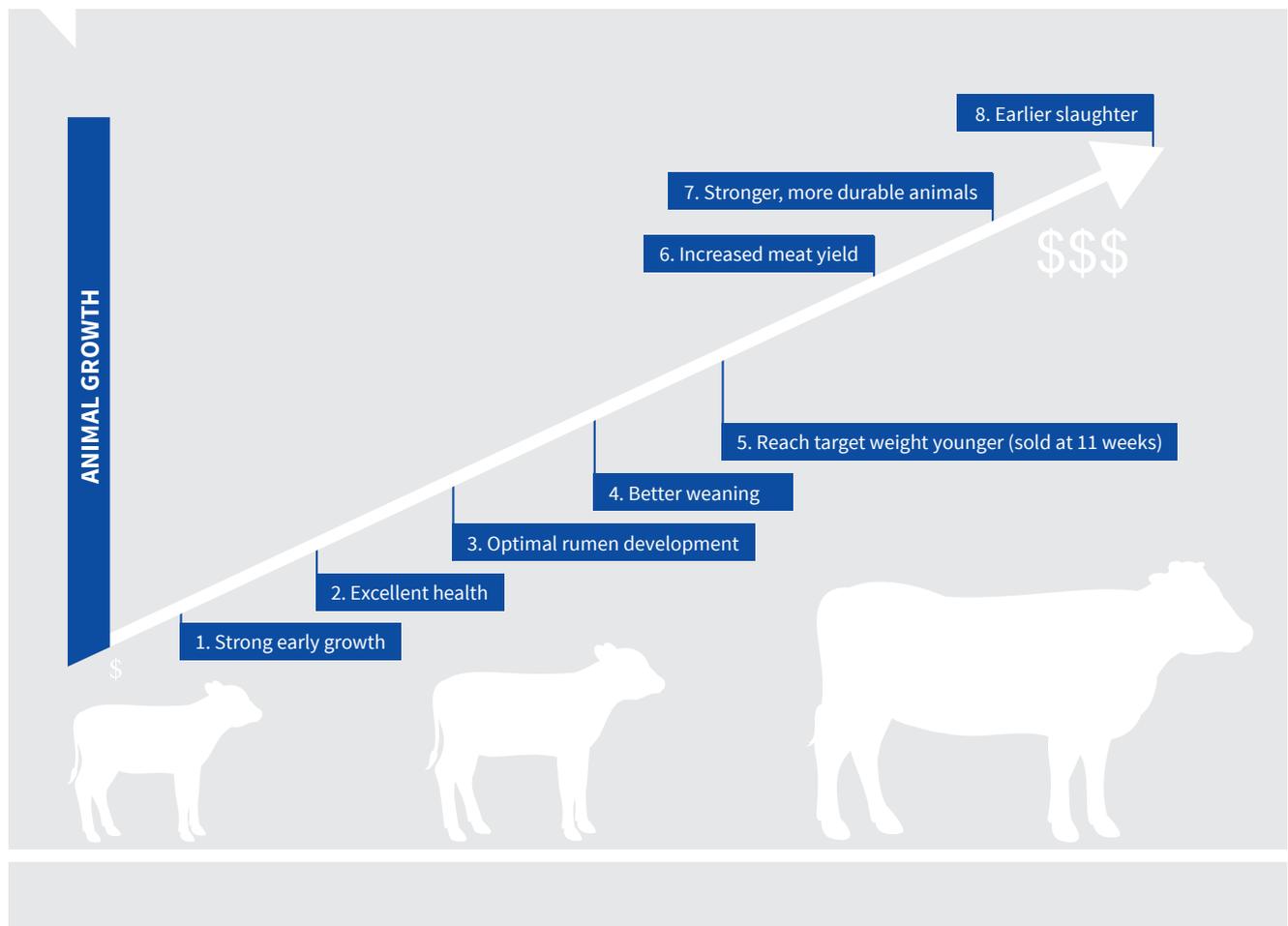
Consider your objectives:

1. Rearing high quality calves will get you a better price
2. If selling calves privately, you'll see regular contracts with satisfied customers
3. Optimising cash flow - faster growth of heifers will enable you to hit weaning/sales targets quicker

The first 8 weeks (pre-weaning) is your opportunity to grow the best beef animals, reaching target weights faster and in better condition. So, getting calves off to the best start is an investment in the future.

That investment starts with feeding high quality colostrum and selecting a good calf milk replacer (CMR).

Growth optimises cash flow



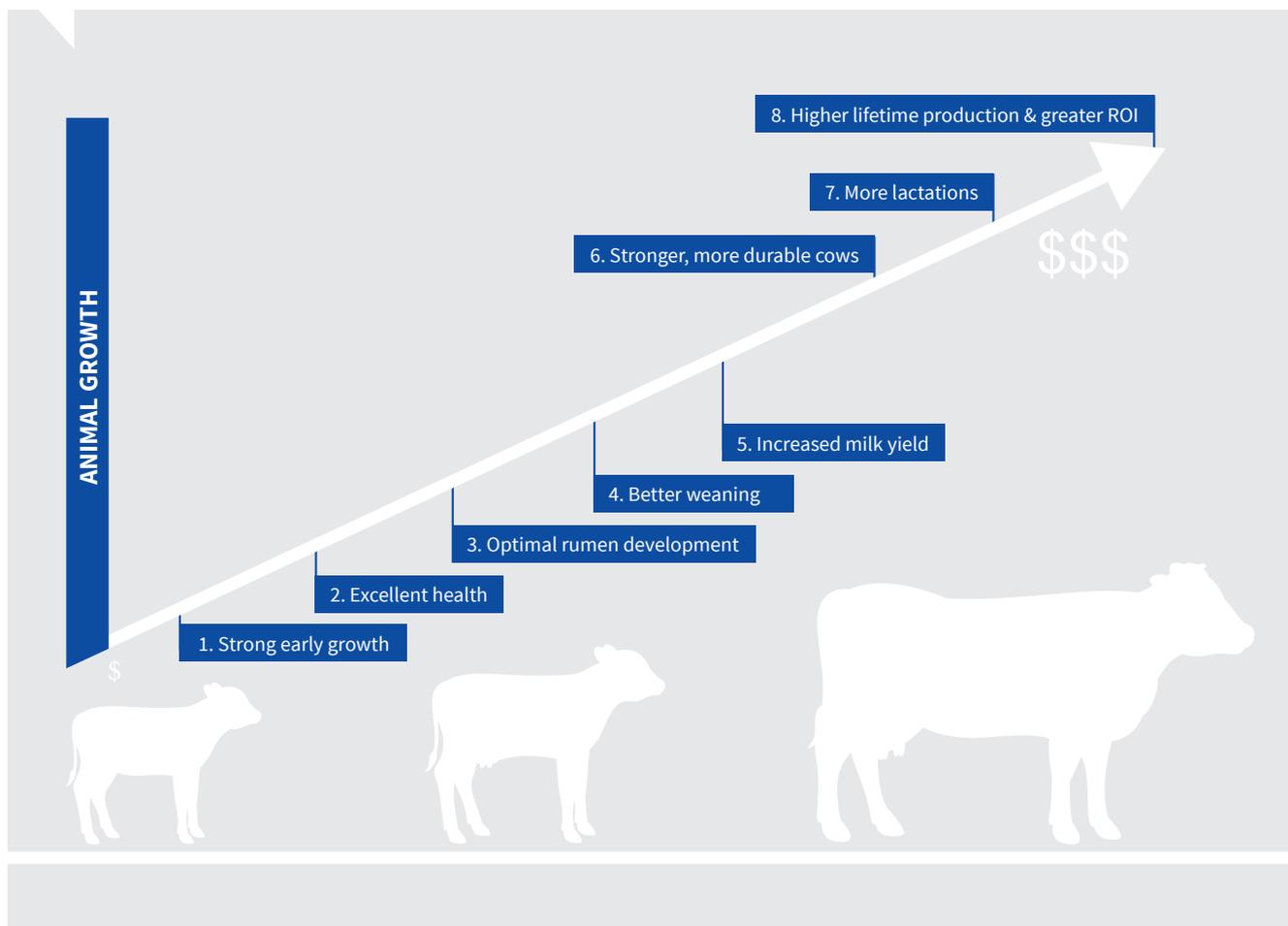
Nutrition in the first 8 weeks for heifer replacements

Good calf rearing practice is crucial for growing a highly productive dairy cow. Optimum development, robustness and longevity is what we are aiming for. Trouw Nutrition's LifeStart offers the science required to unleash their full genetic potential.

Trials show that by applying Lifestart principles, ie feeding calves with better milk more often, there are several benefits. These include:

- ✓ Faster growth and higher average daily weight gain (ADG) - up to 300g/day extra during the pre-weaning phase
- ✓ Optimised udder development
- ✓ Higher milk production – an increase of up to 400L in the first lactation
- ✓ Maintaining body condition score (BCS) during peak production
- ✓ More durable animals results in more lactations
- ✓ Lower replacement numbers

Growth leads to more lactations

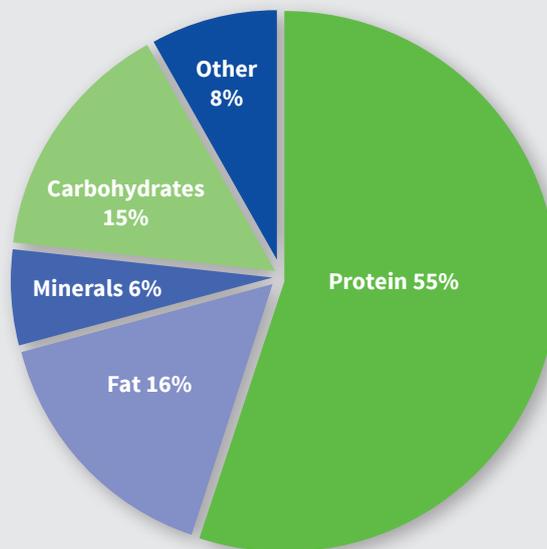


First, feed quality colostrum

Providing high quality colostrum as soon as possible after birth maximises the health of a newborn. Colostrum is the thick, creamy yellow, first secretion from a mother's udder following birth. It is a very complex fluid - rich in nutrients, antibodies and growth factors.

Colostrum intake is important for passive immunity but also for provision of carbohydrates, lipids, proteins, minerals, and vitamins...Additionally it contains [natural] hormones, growth factors, cytokines, and enzymes¹.

Bovine colostrum composition (dry basis)



The protein component of colostrum comprises casein and whey. The whey portion contains lactose, minerals, proteins and antibodies.

- ✓ Antibodies (immunoglobulins) provide passive immunity to the newborn animal
- ✓ Growth factors especially stimulate the growth of the gut
- ✓ Other antimicrobial components include lactoferrin, lysozyme and lactoperoxidase
- ✓ Fats are a direct fuel source

Colostrum contains more protein, fat, energy, vitamins, and minerals than normal milk. However, the immunoglobulins (Ig) content of colostrum is the component essential for growing strong healthy calves.

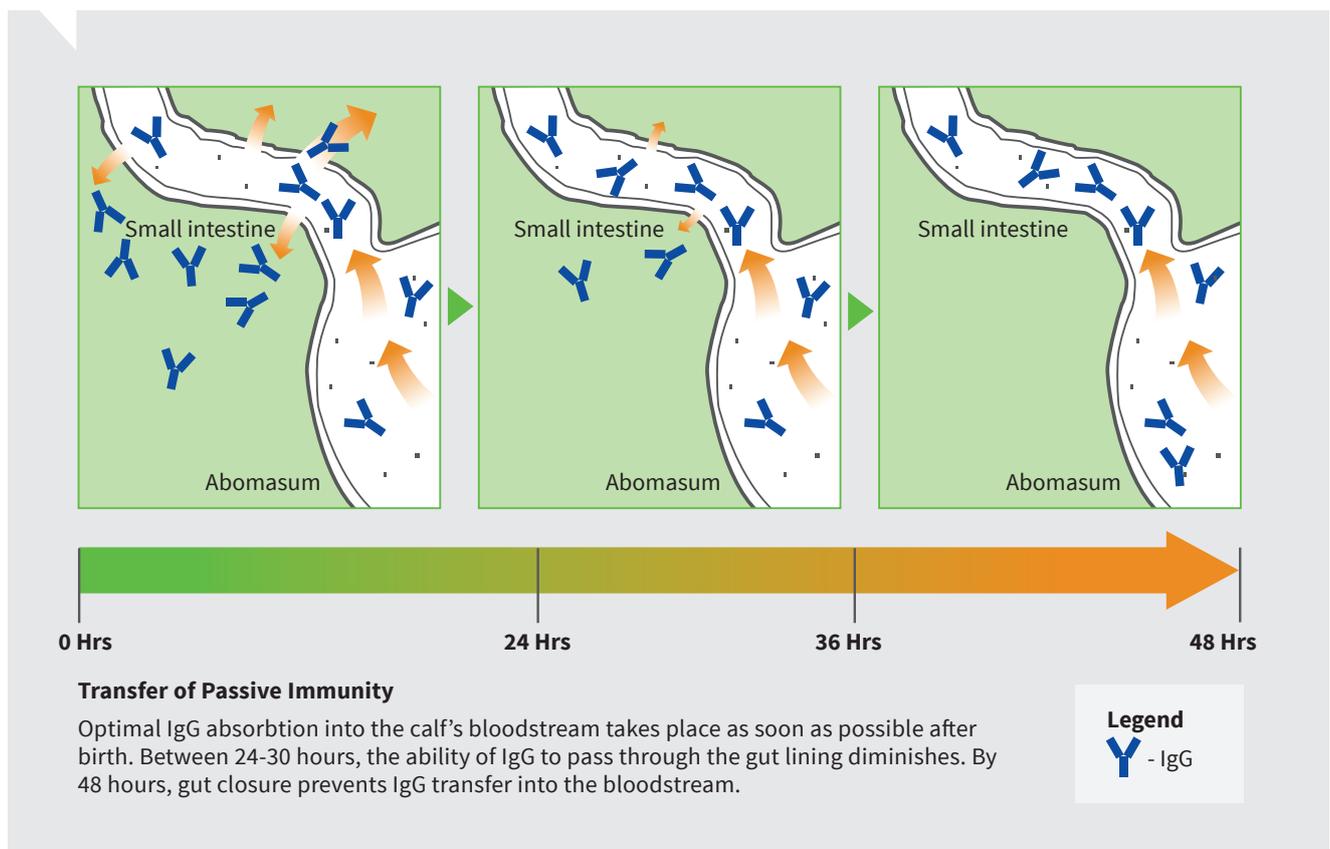
IgG transfer to a calf

Immunoglobulins are key for fighting infections – yet calves are born with virtually none – making colostrum intake in the first 24 hours essential.

The process by which a mother passes immunoglobulins to a newborn via colostrum is called

passive transfer of immunity. The antibodies in the colostrum pass through the walls of the gut to be absorbed directly into the bloodstream.

The window for optimal passive transfer of immunity is about 24 hours; after which the walls of the gut close and antibodies can no longer directly enter the bloodstream.



Failure of passive transfer of immunity

Failure of passive transfer (FPT) occurs when a calf fails to obtain or absorb adequate quantities of IgG from colostrum in the first 24 hours of life – affecting immunity and long-term productivity.

Numerous factors influence the IgG content of colostrum, such as:

- An insufficient quantity of colostrum
- Inferior quality of colostrum, ie colostrum collected from cows after the first 24 hours post birth
- Poor maternal instincts
- Suckling drive of the newborn

ANIMAL NUTRITION

Launchpad18 Colostrum Powder

A premium colostrum powder formulated with high levels of immunoglobulin G (IgG), Launchpad18 is nutrient rich to support early growth and development.

This high-quality source of colostrum is suitable for all ruminant animals and can be used either as the sole colostrum source, or in combination with maternal colostrum.



Launchpad18

- ✓ Colostrum supplement containing 18% IgG for best immunity protection
- ✓ A minimum of 18% fat provides excellent energy boost
- ✓ Made from first-day bovine colostrum
- ✓ Can be used as sole colostrum source, or combined with maternal colostrum
- ✓ Mixes easily
- ✓ Also available in bulk 20kg packs

Mixing directions

- Dissolve 600g of Launchpad18 in 1400mL of clean, warm (38 – 43°C) water to produce approximately 2L of liquid colostrum.
- Mix thoroughly.

Launchpad 18 feeding schedule

Every newborn calf must receive a minimum of 100g of IgG within the first 12 hours of life.

To achieve this, every calf needs 2L of reconstituted Launchpad18 (concentrated colostrum) in 1 feed in the first 12 hours of life.

This will ensure the animal receives 108g IgG.

Birth weight (kg)	Reconstituted Launchpad18 requirement (mLs per animal)
40 (or less)	2 000
45	2 500

How to enrich maternal colostrum

It's a global standard that every calf needs a minimum of 100g IgG in the first feed.

To ensure IgG content of maternal colostrum is adequate, we recommend a Brix refractometer test which will show you the milk solid (MS) %. It's internationally accepted that if maternal colostrum measures 22%MS with a Brix refractometer, then the IgG content will be approximately 50g/L.

To achieve 100g IgG transfer (the minimum IgG requirement for passive transfer of immunity to occur), each calf should be fed a minimum of 2L of colostrum measuring no less than 22%MS (50g/L IgG) in their first feed.

When the quality of the maternal colostrum is questionable, Launchpad18 Colostrum Powder can be used to enrich it.

Our maternal colostrum enrichment table (below) shows the amount of Launchpad18 colostrum powder to add in order to increase MS%.

Please note:

1. The maternal colostrum enrichment table applies to the first 2L colostrum feed only.
2. This practice should be followed regardless of whether the calf had a feed directly from its mother prior to collection.
3. Calves must be fed another 2L of maternal colostrum or Launchpad18 colostrum within 12 hours of the first feed.

Maternal colostrum enrichment table

To achieve the targeted 22% MS for a **2L feed**, you can add Launchpad18 colostrum powder (g/L colostrum) as follows:

%BRIX of Maternal colostrum	Desired %Brix of final mixture (after adding recommended amount of Launchpad18 colostrum powder)
15%	22%
16%	210g
17%	180g
18%	150g
19%	120g
20%	90g
21%	60g
22%	30g
	N/A

Note: a brixmeter test shows milk solid %, so is a guide only.

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Mixing instructions for fortified colostrum

- ✓ Accurately measure recommended amounts of Launchpad18 colostrum powder with an accurate small scale.
- ✓ Using water at 43-46°C water (hotter than this can damage antibodies), mix Launchpad18 powder into a paste prior to adding to maternal colostrum.
- ✓ Mix Launchpad18 with maternal colostrum using a whisk, handheld electric mixer, or mixing vessel. Some small lumps may remain in the mixture; this will not affect the performance of the product.
- ✓ Launchpad18 colostrum powder can also be added directly to maternal colostrum (ie without mixing into a paste) but mixing may not be as effective.

What are the key factors in selecting a milk replacer?

Different brands of calf milk replacer (CMR) are not simply exchangeable. There are essential differences in:

- ✓ Solubility
- ✓ Ease of mixing
- ✓ Digestibility (making use of nutrients)
- ✓ Consistency of ingredients

The differences have a major impact on the health and growth of young calves.

“Successful calf rearing depends on many factors including good nutrition – one should choose a milk replacer based on quality, not price” says Dr Bas Schouten, one of New Zealand’s renowned experts on calf rearing.

“Sprayfo CMRs are a solid starting point for young calves because these products are specifically formulated to ensure easy digestion (causing less nutritional scours) and good solubility. And, critically, will meet the energy requirements of newborn calves.

“Simply put, Sprayfo milk replacers are technically sound and ensure good digestion, resulting in excellent growth rates.”

Trouw Nutrition’s stringent manufacturing process ensures Sprayfo products are consistently good quality from batch to batch.

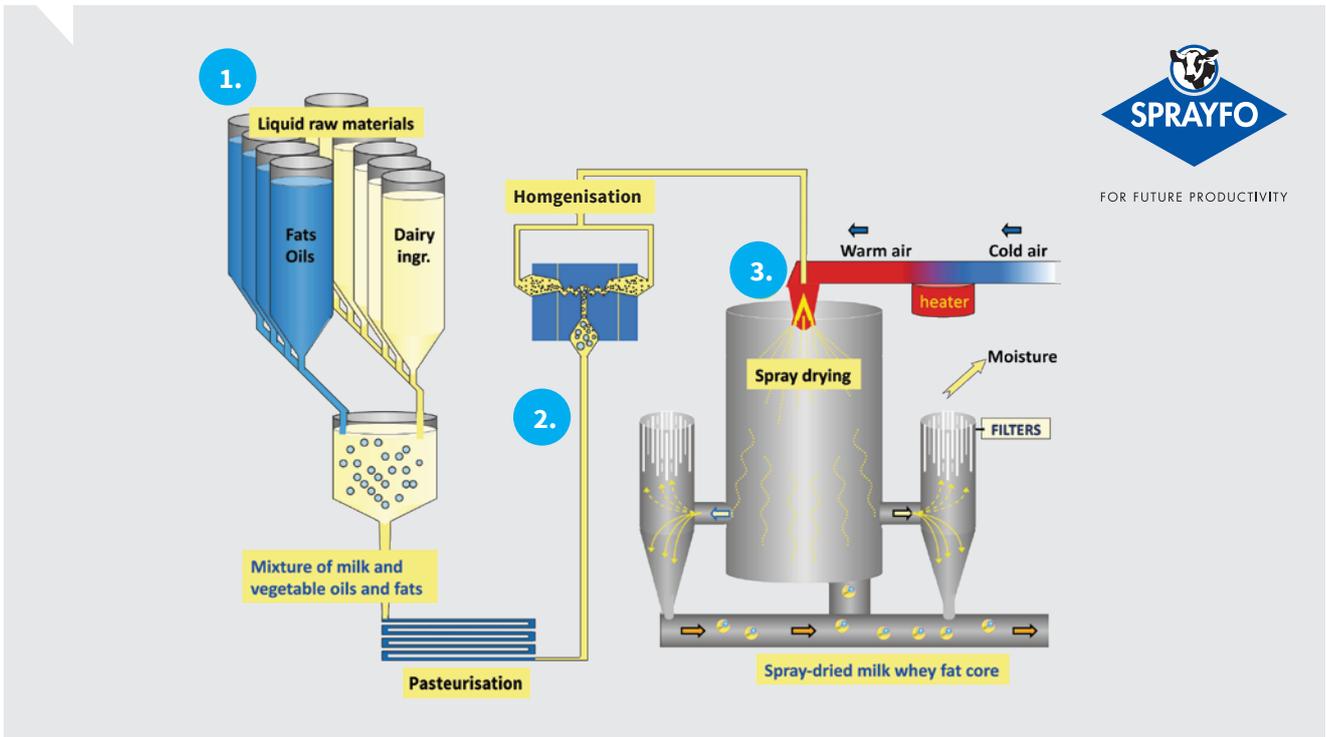
How is Sprayfo different to other milk replacers?

The differences in milk replacers are mainly a reflection of the raw materials used and method of production.

Sprayfo products are a combination of dairy and vegetable ingredients, which are blended using a unique a unique proprietary production process – the Trouw Nutrition Spray Dry System.

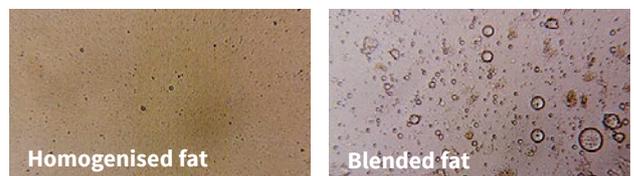
The Trouw Nutrition Spray Dry System makes Sprayfo a unique and consistently high quality, optimally digestible milk replacer.

The Trouw Nutrition Spray Dry System



- 1. The process begins with mixing fresh dairy products with vegetable oils and fats.
- 2. The mix is pasteurised and then high-pressure homogenised. Pasteurising sterilises the product, while homogenisation reduces fat particles to 1/1000 of their original size.

The Homogenisation Effect



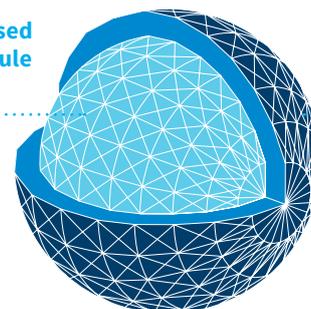
Through homogenisation, fat particles are reduced to 1/1000 of their original size, similar to the smaller fat molecules in cow's milk. (homogenised fat ⇒ 95% of the fat particles < 2µm)

- 3. The product is subsequently dried through a high tech spray drying process to form small particles.

The particles have the valuable protein on the outside, with fat contained inside – the most important ingredient for your animals' growth is available first and absorbed faster.

This fat processing method ensures optimal digestibility, and is unique to Sprayfo.

Micronised fat globule



Encapsulated with dairy products

Why feeding whole milk is not always best

Farmers traditionally prefer to use whole milk to feed their calves. Some find it convenient, others believe it to be a more natural product that is best suited to the calf – mother nature’s original liquid feed strategy.

Whole milk feeding can include transition milk, waste milk, saleable milk from the vat, or a combination thereof.

As a result:

- The results are not always predictable, since what you feed may vary in composition and quality
- Unless milk is pasteurised prior to feeding, there’s always the risk of transmission of pathogens.

For these reasons, we recommend choosing more modern standards of health and performance: look into the benefits of a quality calf milk replacer (CMR) to achieve consistently good results.

- ✓ For dairy farmers, using Sprayfo CMR enables you to maximise returns by selling your milk, rather than using it on farm.
- ✓ For all calf rearers, Sprayfo CMRs will help you to enhance growth and development of your calves pre-weaning for a faster and better return on investment.

AgriVantage offers three quality Sprayfo Calf Milk Replacers:

1. Sprayfo Delta Energised Calf Milk (whole milk alternative)
2. Sprayfo Blue Premium (whey-based) CMR
3. Sprayfo Red Finisher (whey-based) CMR



Sprayfo Delta: the closest alternative to whole milk

Sprayfo Delta mixes the best of whole milk with the best of calf milk replacers (CMRs), providing all the benefits of whole milk feeding with the added consistency of a manufactured product.

What makes Sprayfo Delta your best CMR?

- ✓ **Sprayfo Delta has been scientifically formulated for performance and growth. We call it energised calf milk.**

Based on the composition of whole milk, Sprayfo Delta is high in fat with a balanced nutrient supply (vitamins and minerals) for optimal growth and development.

A higher plane of quality nutrition (energy) will lead to a higher rate of growth.

- ✓ **Sprayfo Delta is higher in fat.**

It contains the highest fat content compared to other CMRs on the market in New Zealand.

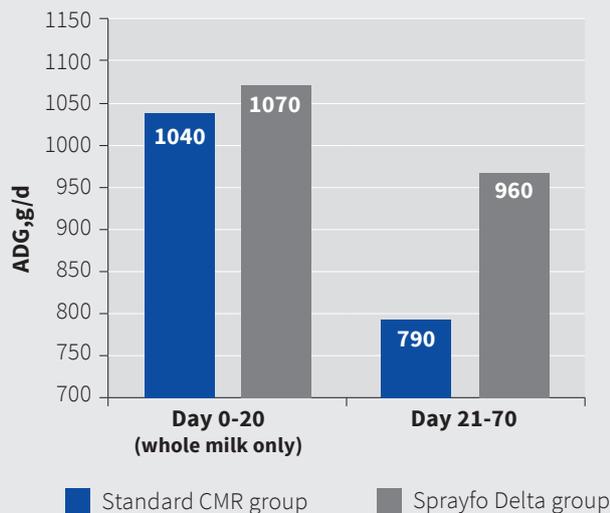
- ✓ **Sprayfo Delta is >95% digestible.**

The true measure of fat and protein content in a CMR is digestibility.

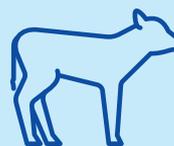
Comparative trial with standard CMR

One group of 15 calves was fed whole milk for the first 20 days of their lives, followed by feeding with Sprayfo Delta until they were weaned at 10 weeks of age. A control group of 14 calves was fed according to the same schedule with a standard CMR.

Results



Note: both sets of calves were fed the same quantity of CMR (in litres) to day 28. In fact, Sprayfo Delta was fed at a lower concentration than the standard CMR during weeks 4-5.



Conclusion

During the first 3 weeks, when both groups were on whole milk, there was no difference in growth. Once the calves were switched to CMR, the group being fed Sprayfo Delta grew faster, adding almost 200g more per day.

The higher rate of growth is ideal for beef rearers wanting to hit weaning/sale targets quicker. While dairy farmers will benefit from fast growing, robust calves with optimal organ and cell development, making better producers in the long term.

ANIMAL NUTRITION

✓ **Sprayfo Delta has similar osmolality to cow's milk.**

Osmosis (the movement of molecules through a membrane, or in and out of a cell) is important for absorption of minerals and nutrients, as well as for gastrointestinal health.

Osmolality is a measure of the concentration of particles in a solution. It is calculated by adding the concentration of sugars, such as lactose, and minerals, including sodium, magnesium, and chloride.

A milk replacer with high osmolality, typically above 500mOsm/kg may affect osmosis and hence present the following challenges to calves:

- Decreased abomasal emptying rate (the gut has a control mechanism to prevent too much of a high osmolality fluid coming in at once), which can lead to diarrhoea in mild cases, and abomasal bloat and death in severe cases.
- Interfere with water absorption, leading to scours. (Less water is being absorbed by the gut, therefore it is excreted at the back end.)

- Cause damage to the cells in the gut, which may result in "leaky gut". This condition is very risky as it leads to pathogens leaking from the gut into the body, causing inflammation and other issues.

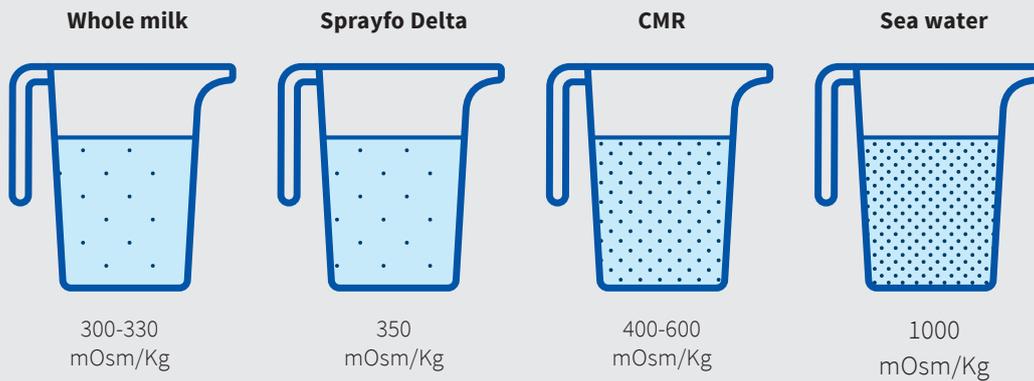
So, the lower the osmolality of a CMR, the better it is for osmosis and hence digestibility.

The osmolality of cow's milk is close to 300mOsm/kg which is optimal for the absorption and digestion of nutrients by calves.

Delta has an osmolality of 350mOsm/kg when mixed at 135g/L. In contrast, many milk replacers (when mixed) have levels above 400mOsm/kg, some closer to 600mOsm/kg. By comparison, salt water has an osmolality of 1000mOsm/kg.

The lactose content in CMR is the main contributor to the osmolality value. High levels of minerals and lactose tend to increase the osmolality of the product. Sprayfo Delta was developed with a low level of lactose, reducing the osmolality of the product by 20% and thus bringing it closer to whole milk.

Note: Mixing Delta at a higher rate than 135g/L will increase the osmolality of the mixed product.



Mixed at the recommended rate of 135g/L, Sprayfo Delta has an osmolality of 350mOsm/L - making it the closest alternative to cow's milk.

A higher mixing rate would reduce osmolality but, compared to other CMRs mixed at the same rate, Sprayfo Delta will still have a lower osmolality.

What are the benefits of feeding Sprayfo Delta over whole milk?

✓ Consistent quality means predictable results

If part of the whole milk fed is waste milk, the composition of what calves get daily will vary. Even the composition of whole milk from the vat may vary from day to day, leading to variable results.

The Sprayfo Spray Dry process creates an optimal fat globule size, similar to cow's milk for improved solubility and stability in solution.

The consistent composition of Sprayfo Delta will deliver predictable results.

✓ Sell more milk

Next to the obvious fact that introducing CMR enables dairy farmers to sell all saleable milk, feeding Sprayfo Delta will result in an increase of average lifetime daily production (increased milk yield and more lactations per cow) in the long term.

✓ Better biosecurity

Sprayfo Delta undergoes a double pasteurisation step, ensuring it's free of bacteria.

Whole milk feeding carries the risk of disease transmission, particularly of M.Bovis and Johne's disease. Feeding a calf milk replacer reduces the risk of indirect contact between cow and calf, reducing the risk of transmission.

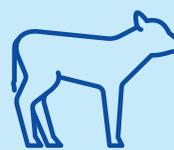
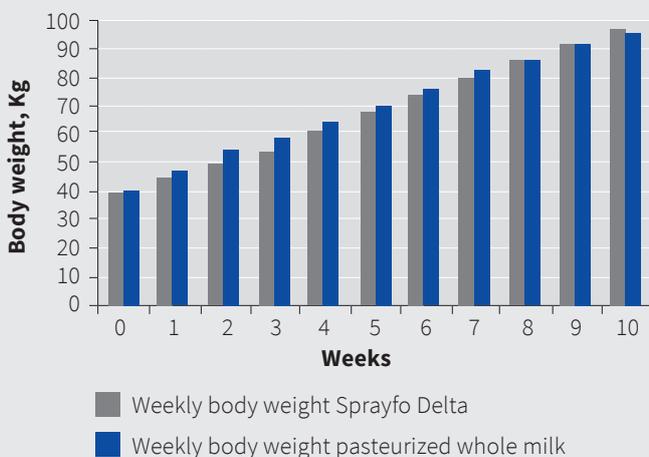
✓ Less need for variable quality whole milk sourced from dairy farmers.

Comparative trials with whole milk

Two groups of 20 calves each were included in the trial.

Both groups were housed in the same conditions and fed through an automatic feeder. One group was fed Sprayfo Delta at 135g/L, the other group was fed whole milk. Both groups were fed according to the same schedule and weaned at 10 weeks of age.

Sprayfo Delta vs pasteurized whole milk



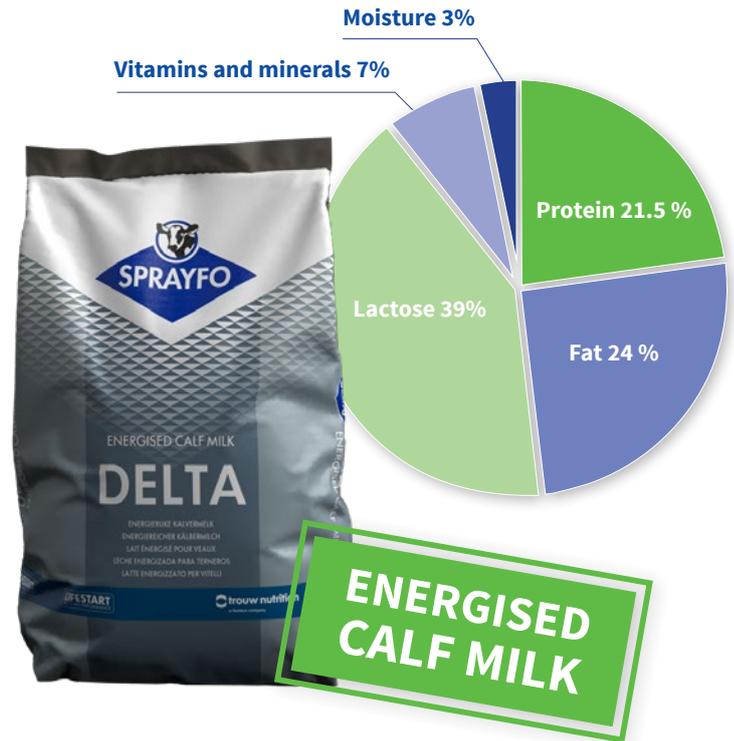
Conclusion

Performance in the Sprayfo Delta group was marginally better, ADG (average daily gain) for the whole period of 10 weeks was 836g/day for the Sprayfo Delta group, compared to 801g/day for the whole milk group.

ANIMAL NUTRITION

Sprayfo Delta

- ✓ High energy curding CMR for optimal performance and fast growth rates
- ✓ Improves future robustness of the animal
- ✓ Osmolality similar to cow's milk – improves digestion and reduces risk of scours
- ✓ Balanced mineral composition to meet calf requirements
- ✓ Optimises organ development, especially of the mammary gland parenchymal tissue
- ✓ Improves long-term productivity – increased meat yield for beef, increased lactation for dairy
- ✓ Consistent quality

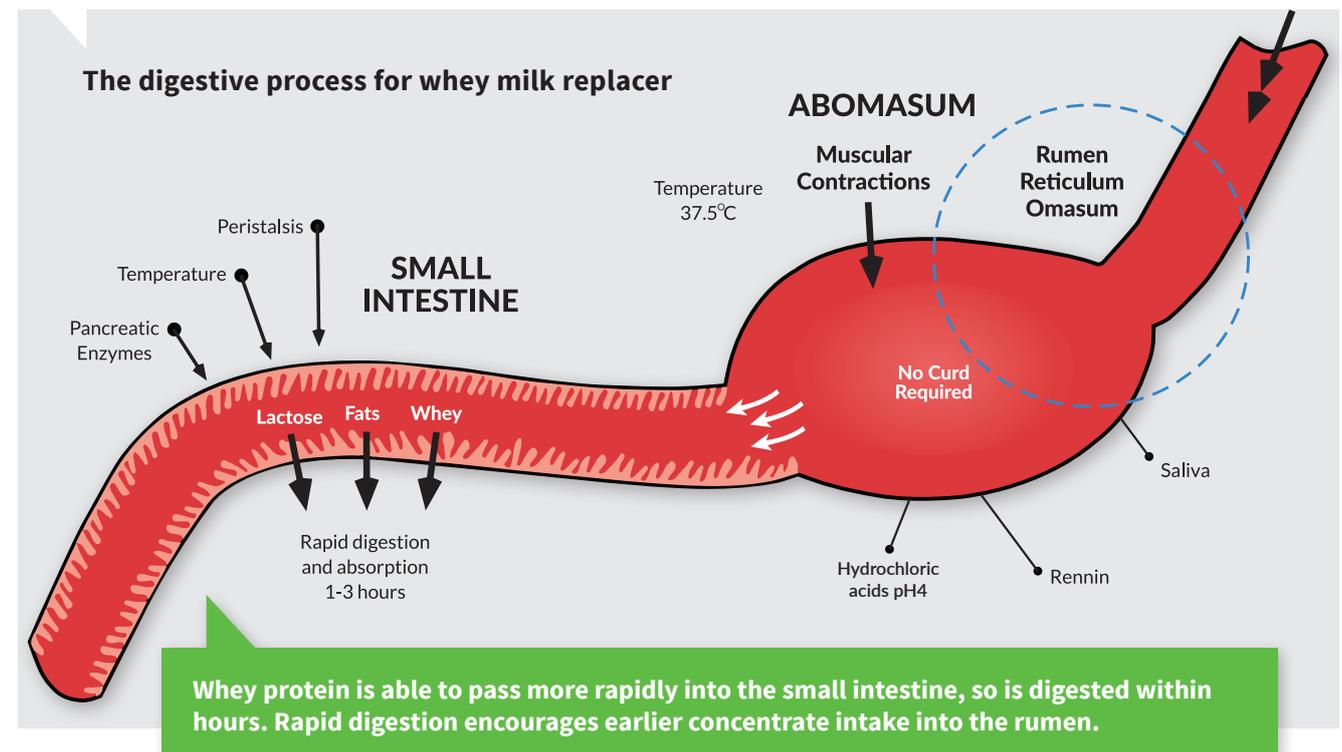
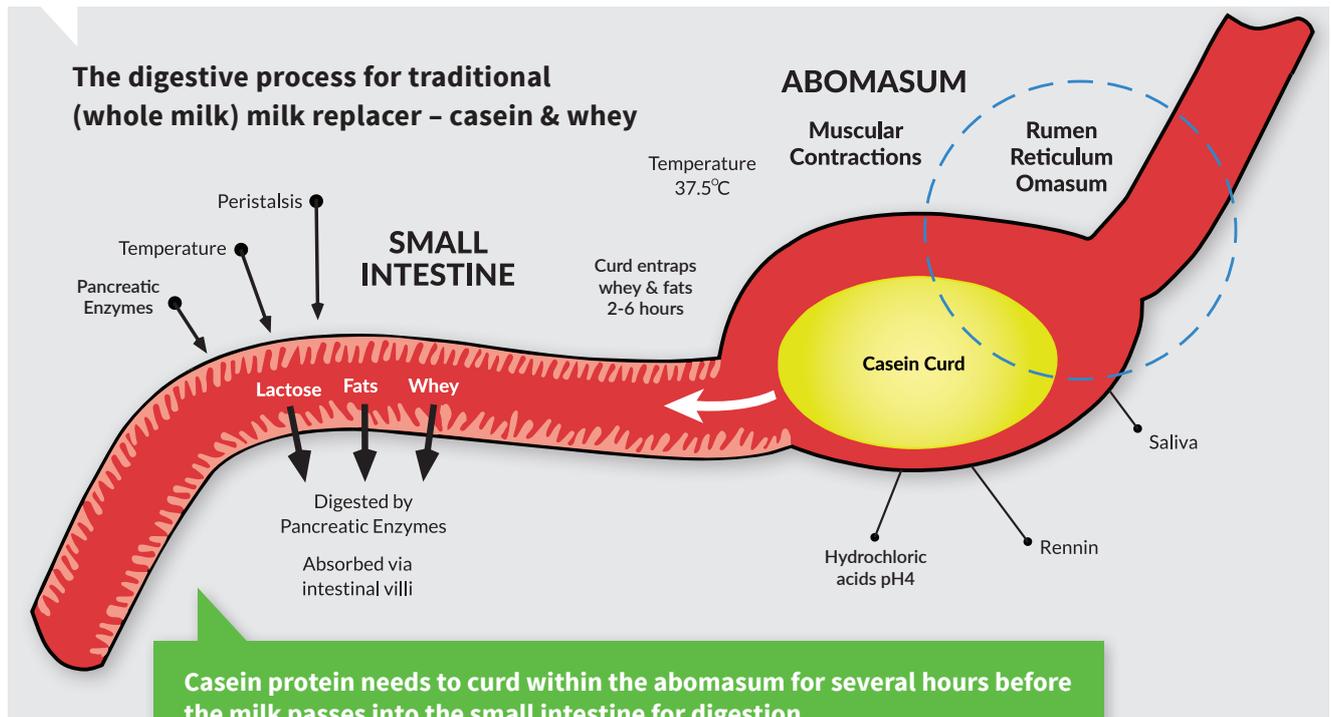


The benefits of feeding whey milk replacer

Whey-based milk replacer will meet the energy requirements of growing calves, effectively boosting growth rates.

1. Whey is easy to digest

Quality whey based formulas are easily digested in the gut, moving through a calf in only 2-3 hours, compared to 5-8 hours for traditional curdling (casein) formulas.



ANIMAL NUTRITION

2. Why is cost-effective

With whey powders moving through an animal's system in 2-3 hours, they will seek out concentrates (meal) sooner, without growth rates being compromised.

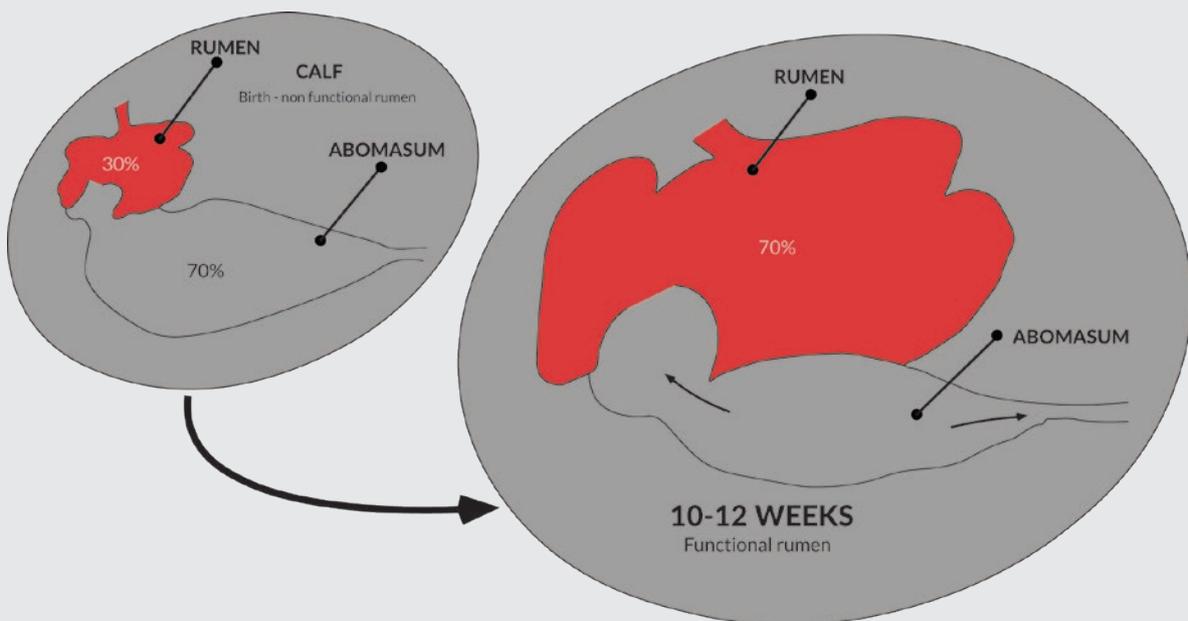
- ✓ Concentrates are obviously a more preferable, lower cost feed source for calf rearing.
- ✓ Whey powders can also be mixed with whole milk (commonly known as fortifying), increasing its flexibility as a replacer.

3. Why helps the weaning process

Animals reared on whey-based powders develop their rumen quicker, handling the transition through weaning with a reduced risk of the growth check common in stock reared on curdling powder.

- ✓ Early rumen development is essential for profitable animal rearing.
- ✓ Rearing report less stress and continued strong growth rates, making for healthier, bigger, well-conditioned young stock.

Calf rumen development



Sprayfo Blue Premium CMR

- ✓ Premium quality Calf Milk Replacer
- ✓ Can be fed to calves from 4 days' old
- ✓ Whey protein for faster digestion
- ✓ Hydrolysed wheat protein aids digestibility (no soya)
- ✓ Dissolves easily, even in cold water
- ✓ Superior suspension – won't drop out of solution
- ✓ Can be mixed with liquid whole milk
- ✓ For optimal, safe calf rearing
- ✓ Available in 20kg bags



Sprayfo Red Finisher

- ✓ Good quality Calf Milk Replacer, for economical rearing
- ✓ Can be fed to calves from 14 days' old
- ✓ Whey protein for faster digestion
- ✓ Hydrolysed wheat protein aids digestibility
- ✓ Contains soya protein (lower cost)
- ✓ Dissolves easily, even in cold water
- ✓ Superior suspension – won't drop out of solution
- ✓ Available in 20kg bags



Recommended feeding schedules for young calves

Always ensure each animal has adequate intake of controlled quality colostrum in first 12 hours post birth (approx. 10% of its body weight).

Also, feed a minimum of 500g dry matter per calf per day.

You may choose to feed calves once or twice daily, depending on your operation and objectives.

We recommend twice daily feeding for getting calves off to the best start – higher initial average daily gain (ADG) and a routine that's closer to how a calf would naturally feed. There are pros and cons to both feeding schedules.

Advantages of twice daily feeding

- ✓ Easier to feed larger total volume over two feeds
- ✓ Can achieve higher initial average daily growth (ADG) rates due to the ability to feed larger total volume and grams/calf/ day
- ✓ More natural; closer to how a calf would feed from its mother

Advantages of once daily feeding

- ✓ Faster rumen development
- ✓ Less labour intensive
- ✓ Nullify weaning 'check'

Feeding schedules

If using Sprayfo Delta or Sprayfo Blue Premium, follow the below feeding schedules.

Twice daily feeding schedule with Sprayfo Delta or Sprayfo Blue Premium

Age	Quantity	Mixing rate	Total CMR/day
Day 0-1	Feed maternal colostrum or Launchpad18 or a combination of the two (ensure colostrum is high quality)		
0 - 4 days	2 x 2L maternal colostrum		
5 - 21 days	2 x 2L	125-150g/L	500-600g
22 days - weaning	2 x 2.5L	125-150g/L	625-750g

Once daily feeding schedule with Sprayfo Delta or Sprayfo Blue Premium

Age	Quantity	Mixing rate	Total CMR/day
Day 0-1	Feed maternal colostrum or Launchpad18 or a combination of the two (ensure colostrum is high quality)		
0 - 4 days	2 x 2L maternal colostrum		
5 - 14 days	2 x 2L	125-150g/L	500-600g
15 days - weaning	1 x 3L	200-250g/L	600-750g

Mixing instructions

Always follow feeding instructions

- ✓ Heat all required water to 40-42°C
- ✓ Start stirring water, then slowly add milk replacer powder, mixing for 2 to 4 minutes*
- ✓ Best drinking temperature 38-39°C

* Mix to make up a litre, NOT on top of a litre, eg. add 150g milk powder to 850mL water to make 1L milk replacer. This is an approximation.



Sprayfo Red Finisher

Twice daily feeding schedule with Sprayfo Red Finisher

Age	Quantity	Mixing rate	Total CMR/day
Day 0-1	Feed maternal colostrum or Launchpad18 or a combination of the two (ensure colostrum is high quality)		
0 - 4 days	2 x 2L maternal colostrum		
5 - 14 days*	2 x 2L	125-150g/L	500-600g Sprayfo Delta or Blue Premium
15 days - weaning	2 x 2.5L	125 - 150g/L	625-750g Sprayfo Red

Once daily feeding schedule with Sprayfo Red Finisher

Age	Quantity	Mixing rate	Total CMR/day
Day 0-1	Feed maternal colostrum or Launchpad18 or a combination of the two (ensure colostrum is high quality)		
0 - 4 days	2 x 2L maternal colostrum		
5 - 14 days*	2 x 2L	125-150g/L	500-600g Sprayfo Delta or Blue Premium
15 days - weaning	1 x 3L	200-250g/L	600-750g Sprayfo Red

***SPRAYFO RED FINISHER IS RECOMMENDED FOR CALVES FROM 14 DAYS OLD ONLY**

Mixing instructions

Always follow feeding instructions

- ✓ Heat all required water to 40-42°C
- ✓ Start stirring water, then slowly add milk replacer powder, mixing for 2 to 4 minutes*
- ✓ Best drinking temperature 38-39°C

* Mix to make up a litre, NOT on top of a litre, eg. add 150g milk powder to 850mL water to make 1L milk replacer. This is an approximation.



Weaning instructions

Weaning can start when animals are a minimum of 70kg, or 30kg above birthweight, AND consuming 1kg concentrates per animal per day.

Calves need to be healthy and well developed. Avoid stressful procedures such as debudding and regrouping at time of weaning.

- ✓ Slowly reduce concentration of milk replacer of overall volume consumed over 1-2 week period
- ✓ Continue feeding concentrates at 1 - 2kg per day for at least a month

Disease prevention

Your animal remedies checklist for the rearing barn

Please note:

- ✓ The drugs suggested are listed as a guideline only. Please consult with your veterinarian.
- ✓ Dose rates for these drugs and animal health products must be set and approved by your veterinarian.

- Digital clinical thermometers x 2
- Antibiotics: Penicillin OR Bovatop injection
- Anti-inflammatory drug: Ketofen injection OR Metacan injection
- Vaccines: Covexin 10
- Eye ointment
- Iodine spray

- Disinfectants & virucidal solutions – Virkon, Vetsan
- Syringes & needles: 5 x 5mL syringes, 18 x ½ needles, 16 x ½ needles
- Methylated spirits (to sterilise needles & syringes)

- Electrolytes – Revive or Dexolyte
- Dextrose 5kg for weak calves – add 1 Tbsp Dextrose per L of electrolytes fed. DO NOT USE SUGAR.

- Sodium Bentonite – Trufeed, Opticalf, Optiguard
- Probiotics – Procalf Plus OR Biostart
- Prebiotics - Biopect

- Stalosan F – to help control ammonia levels in bedding



Disease Prevention - Navel Infection

- By Dr B.W. Schouten

Infections of the navel cord (navel infection) can occur in the newborn of any farmed species. It is rarely seen in newborns on clean pasture but is very common in calves, kids and lambs born under adverse weather or in muddy conditions, orphaned at birth, deprived of colostrum or roughly handled at birth.

At birth, the vessels of the navel cord have a direct route to the body cavities, creating a direct portal for infections of vital organs. The navel cord has a direct connection with the liver (the largest blood organ). In fact, the distance from the cord to the liver is only about 5cm.

Commonly, navel infections are not isolated to just the navel area but frequently cause abscesses in the liver before spreading to other organs – such as the lungs, brain and joints (commonly referred to as Joint Ill).

It is not uncommon for the incidence of navel infections in housed newborns to be as high as 30% -50% and to be a major cause of deaths and ill thrift.

How to prevent navel infection

- ✓ Handle and transport newborns carefully. Trampling and overcrowding causes bruising and infection.
- ✓ Ensure the animals have soft clean bedding of sawdust shavings, newspaper or carpet. Spray the bedding with an anti-bacterial/viral spray.
- ✓ Do not over crowd the pen during transport.
- ✓ Spray the navel cord as early as possible (in the paddock before transport) and repeat on arrival to the rearing barn. Best to use a purple spray or iodine spray.
- ✓ Spray the navel cord daily for the first 2 days.
- ✓ Some rearers give all housed calves a prophylactic antibiotic injection on arrival.



Joint Ill presents as an abscess in the leg of this calf.



When calves are sick, they will often curl up alone in the corner of the shed

Signs and symptoms of navel infection

- ✓ Occurs within the first 5 days after birth
- ✓ The animal has a swollen navel, which is hard and firm to touch
 - hot, pus or blood appears if squeezed
 - painful when squeezed (this differentiates it from a simple navel hernia)
- ✓ The animal often stands with an arched back
 - Reluctant to walk
 - Usually sitting in the corner or back of the pen
- ✓ Animal is reluctant to drink
- ✓ Has a high fever (greater than 39.2°C)

Treatment of navel infection

Prevention is the best treatment because if an infection enters the body, the newborn is already compromised.

Treatment is by antibiotic injections - and good treatment protocol must be adhered to for it to succeed.

Common antibiotics and dosages are:

1. Penicillin (short acting form)

Shake the bottle well and give 5mLs daily for 5 days. Inject under the skin behind the shoulder. Use an 18x 3/8 needle for best results.

2. Penicillin LA (long acting form)

Shake well. Dose 5mls every 2 days. Inject under the skin behind the shoulder. Use an 18x 3/8 needle for best results.

3. Oxytetracyclines – in short or long acting form

Short acting form - dose 5mLs daily, under the skin*
 Long acting form - dose 5mLs alternative days (total 2 shots), under the skin* Use an 18x 3/8 needle for best results.

*NB: tetracycline creates more irritation than penicillin, so do not inject into muscle.

Antibiotics must be purchased from your local veterinary clinic. Consult with them for the antibiotic that is the most suitable for your situation.

The bottom line is to observe all new arrivals carefully and, if treatment is needed, treat for long enough and at the proper dose rate.

Disease prevention - scours

Scours is the single biggest killer of young animals. Causes are either:

1. Nutritional – due to stress, cold, low IG, low quality milk/milk replacer
2. Infectious – Rotavirus, Coronavirus, Cryptosporidium or Bacterial (Coliforms, Salmonella)

It's good practice to monitor animals daily for signs of disease, such as:

- ✓ Change in activity level
- ✓ Decrease in appetite
- ✓ Dullness in their eyes
- ✓ Diarrhoea
- ✓ Snotty nose
- ✓ Coughing
- ✓ Lameness
- ✓ Check temperature with a digital clinical thermometer. Normal temperature is 38.6 - 39.4°C for calves*.

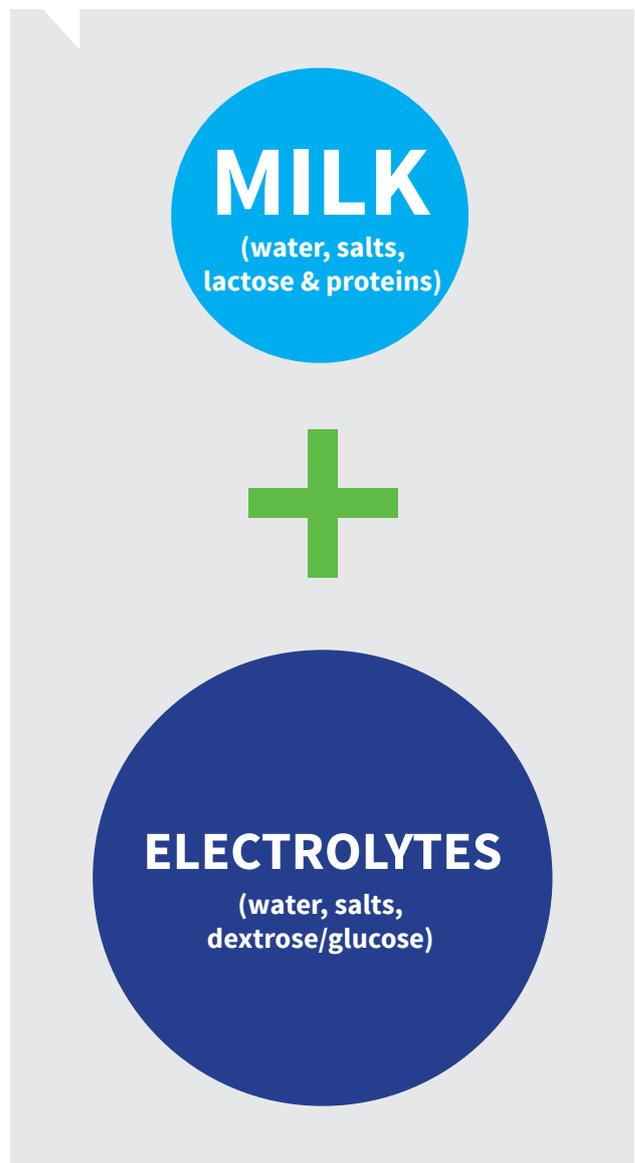
They are also most susceptible to disease during or after periods of risk or stress, for example:

- ✓ transportation and new environment
- ✓ change in diet
- ✓ adverse weather conditions
- ✓ dirty housing

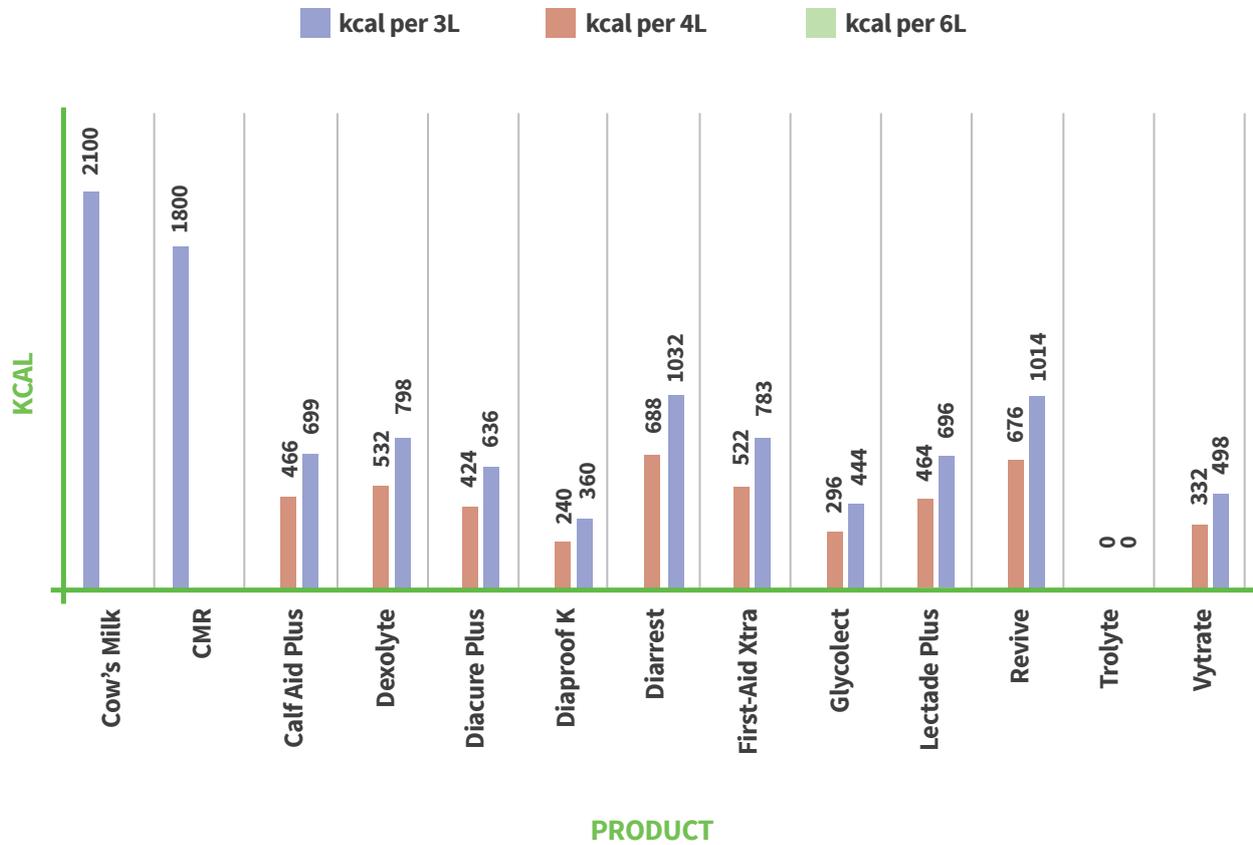
*Always take the temperature of a pen mate - to determine if the temperature of one animal is higher than the other.

Treatment

Scouring calves die of dehydration and lack of energy, not diarrhoea. It's important to maintain fluids and energy levels by feeding:



Energy delivered by electrolyte replacers (4L and 6L) and cow’s milk and CMR (3L)



Electrolyte therapy

	8AM	NOON	4PM	ALL NIGHT	TOTAL
MODERATE SCOURS	Milk 2L	Electrolytes 2L	Milk 2L	Electrolytes AD-LIB	6L – 10L
SEVERE SCOURS	Electrolytes 2L	Milk 1L	Electrolytes 2L	Electrolytes AD-LIB	6L – 12L

Boost calves with Biopect

Biopect is an all-natural anti-scour* product containing pectins, electrolytes and dextrose.

Feeding Biopect to young stock will help to ensure good gut health – promoting a healthy digestive tract and a healthy immune system. It also provides them with an energy boost.

Add to milk when calves are exposed to stress such as transportation, a new environment, change in diet, adverse weather conditions, dirty housing and other situations where animals are at risk of scours.

How does it work?

Biopect contains electrolytes, energy and pectins:

- ✓ Pectins and other fibres from dried fruit and pulp form a protective gel-like layer in the intestines
- ✓ Electrolytes may provide essential mineral salts
- ✓ Glucose provides energy and aids in the absorption of electrolytes.



Biopect

- ✓ For maintaining gut health in calves, lambs, kids, foals and piglets
- ✓ Contains plant fibres, glucose and electrolytes
- ✓ Non-medicated; does not contain antibiotics
- ✓ Can be fed in milk, milk replacer or water - no need to remove milk or milk replacer from diet during treatment
- ✓ Available in 2.5kg, 5kg and 25kg

Biopect treatment schedule for calves

Stir Biopect powder into warm (40°C) milk or water. Feed immediately after mixing, as the suspension will settle over time.

Rate/2L milk*	Rate/2L water*	Feeds/day
25g		2
	50g	ad-lib

Dose rate may be doubled when calves are exposed to stressful situations, or where additional energy and electrolytes are required.*

*Please contact your veterinarian for advice if calves have infectious scours (eg. temperature over 39.5°C), or if scours are severe and/or diarrhoea persists.

Bacteria control in housing

Growing healthy animals – boosting their wellbeing and preventing disease to optimise their nutritional uptake – will depend heavily on having a good biosecurity programme.

With the ability to improve the housing environment, aiding in the control of pathogens, Stalosan® F is the ideal biosecurity aid for rearers.

Because Stalosan F can be added while animals are present, you'll have consistent disease control. Also, it is a powerful drying agent that binds ammonia in the air to reduce ammonia emissions.

What's in Stalosan F?

Stalosan F contains no toxins. It does not invade or destroy cells, rather it works as an absorbent, attaching organisms to its surface.

How does Stalosan F compare to liquid disinfectants?

Liquid disinfectants kill pathogens as they come into contact with them but can be quickly deactivated by organic matter in animal houses.

A liquid disinfectant will have no effect on the diseases entering animal houses with newly introduced animals, while Stalosan F will minimise the proliferation of any diseases entering the animal house.

Stalosan F also remains active for several days, providing consistent disease control by stabilising the microflora and chemical balance in animal bedding.



Stalosan® F

- ✓ For improving the environment and minimising proliferation of bacteria, viruses, fungi, parasites, fly larvae, ammonia and moisture to improve bedding quality in animal housing
- ✓ Easy to apply by hand or with an AgriVantage applicator
- ✓ Remains active for several days, even in the presence of manure and bedding
- ✓ Powerful drying agent
- ✓ Can be applied to most animal housing, including cattle, pigs, goats, sheep and horses
- ✓ Available in 15kg

Application rate

Apply 50g Stalosan F per square metre.

For pen preparation, apply 100g Stalosan F per square metre. See page 28 for pen preparation instructions.

CALF HOUSING & HYGIENE

Stalosan F will give you improved control* of the following:

Bacteria	Viruses	Fungi	Parasites
Clostridium	Rotavirus	100% effective against all types	Coccidiosis
E. Coli	No viral resistance		Fly larvae
Pasturella			Roundworms
Pseudomonas			
Salmonella			
Staphylococcus			
Streptococcus			
No bacterial resistance			

*Preventing them from growing again.

Pre-season pen preparation

1. Clear pens of old bedding material
2. Spray with a strong liquid disinfectant to kill bacteria. Take care to spray rails, gates and vertical walls.
3. Cover the floor with a layer of Stalosan F (100g/m²). The layer of Stalosan F underneath the bedding is an excellent preventative and will absorb moisture and ammonia that filters through the bedding.
4. Add bedding on top of the Stalosan F. When applied on top of animal bedding, Stalosan F will remain active for several days - controlling bacteria, viruses, fungi, parasites, fly larvae, ammonia and moisture in the bedding.

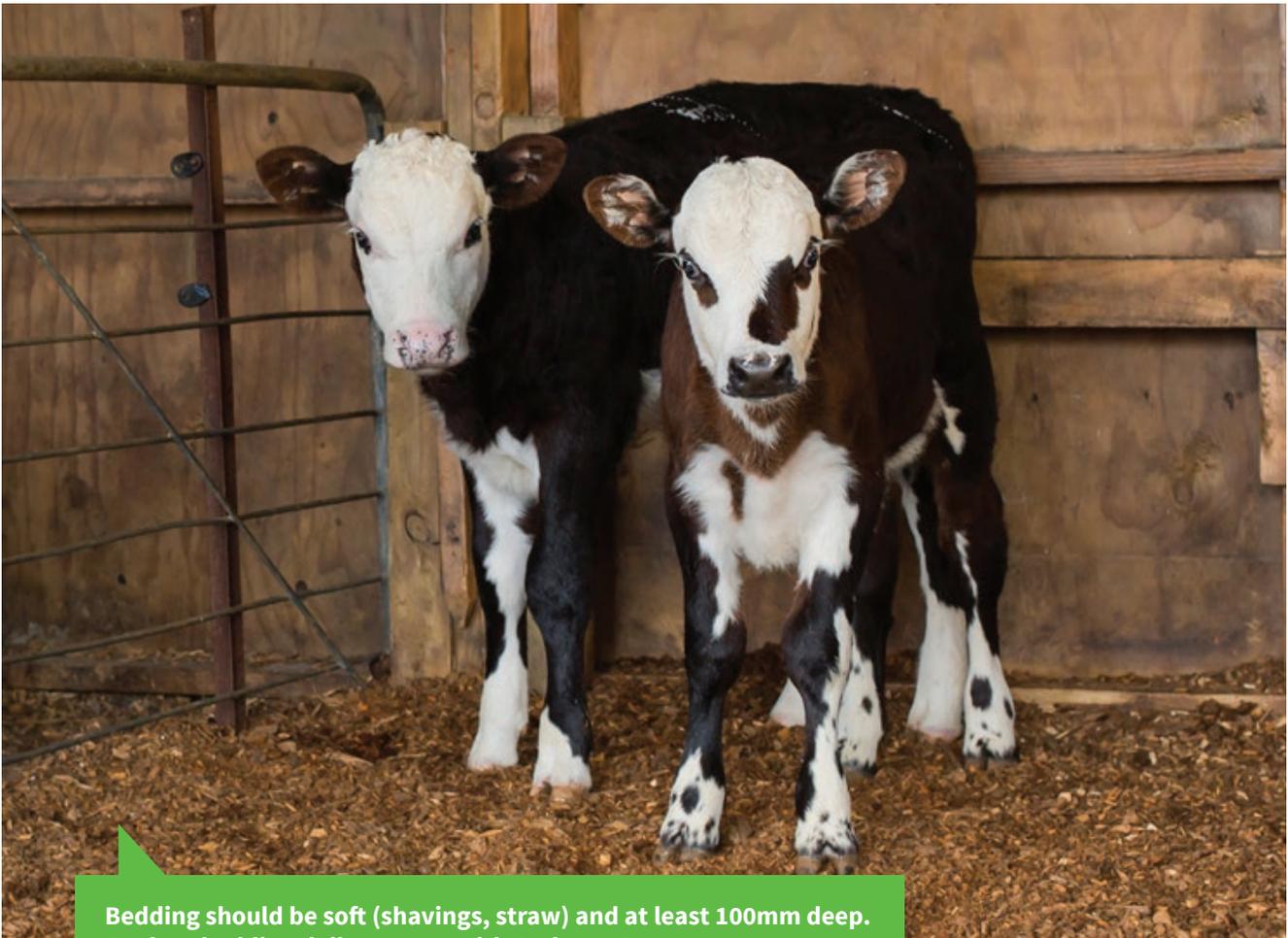
Regular application (50g/m² once weekly) of Stalosan F stabilises the microflora and chemical balance in bedding, creating a naturally healthy rearing environment.

Use Stalosan F in conjunction with a quality liquid disinfectant, alternating applications every 3-4 days.

Housing - dry and draft-free

There should be enough barn space to house at least 50% of calves born on farm. Best practice is to have multiple barns, so that young calves can be isolated from older or sick calves.

- ✓ Barns should be open on one side and divided into group pens, holding no more than 20 calves (10 is ideal).
- ✓ Calves should be placed in their allocated pens and stay there for the entire indoor rearing period.
- ✓ Each calf should be placed in a clean group pen that has not been previously used by other calves.
- ✓ Locate calf barns well away from the cow shed and feeding pads (to prevent the spread of disease).
- ✓ Disinfect the barn, feeding utensils and trailer with a good quality, safe virucidal product (a strong liquid disinfectant) twice a week.
- ✓ Control rodents, birds and dogs.



Bedding should be soft (shavings, straw) and at least 100mm deep. Replace bedding daily or treat with Stalosan F.

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With the support of Dr Bas Schouten, one of New Zealand's most renowned rearing experts, Nutritionist Natalie Chrystal and our global partners, we work with you to maximise the development and subsequent production capacity of your livestock.

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