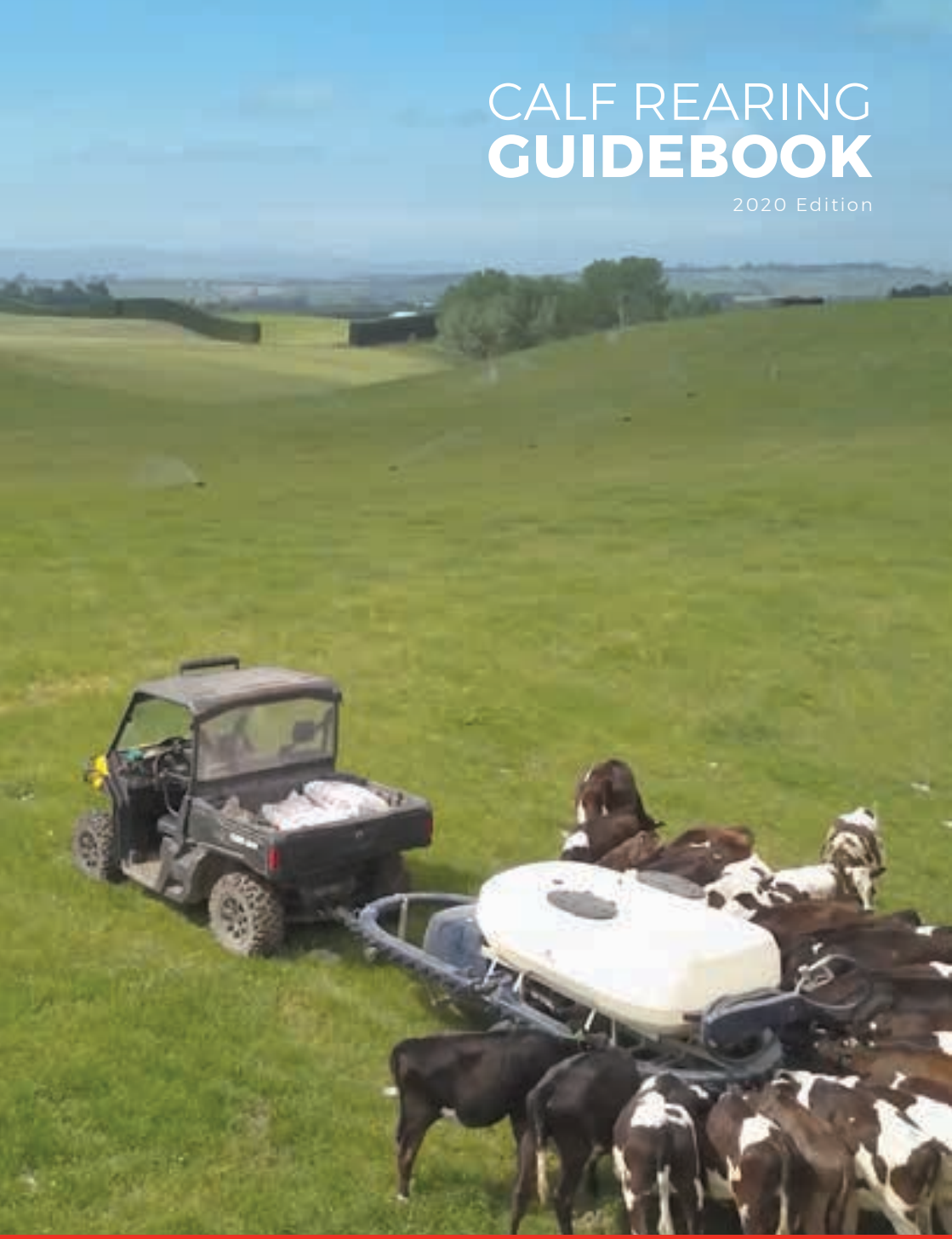
CALF REARING
GUIDEBOOK

2020 Edition



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feedsales@milligans.co.nz | www.milligansfeeds.co.nz

Milligans Feeds Ltd
Calf Rearing Guidebook

A proud 100% New Zealand owned and operated company based in Oamaru, South Island, Milligans Feeds is one of New Zealand's leading suppliers of animal nutrition products.

Having over 30 years experience in producing high quality, top performing calf and lamb milk replacers, Milligans Feeds has been the choice for generations.

With our many years of producing milk replacers, it has allowed us to constantly improve our products by way of quality ingredients and manufacturing techniques which prove themselves on farm.

We strive to provide New Zealand farmers with the best products for their young stock and endeavour to give full support by way of knowledge and advice. This booklet was developed to provide you, the 'rearer', with the tools and advice on rearing a better animal for profit if it's your business or if it's simply a farm pet.

Milligans Milk Replacer Quality and Performance

Each product in the Milligans Milk Replacers range is batch tested for functional and nutritional properties to a strict level. All additives used in our products are at the manufacturer's recommended therapeutic rates for the best performance possible.

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Contents

Getting started: Economic decisions

Before you decide to rear calves there are a few factors you need to consider:

Economics & viability: Can I afford to do this and what is my goal outcome?

Experience: Have you reared before, or is it your first time?

Quantity: How many animals shall I or can I rear?

Infrastructure: Do I have the facilities to rear high quality calves?

Cost: How much are calves, shelter, equipment and feed?

Pasture: Am I going to keep my stock, and if so, do I have enough good quality pasture for the number of animals to be reared?

Selecting your calves:

Important criteria for the best start.

Selection of calves for rearing is important as it determines how successful the calf operation will be. It is best to avoid calves that are hindered from the start, as these calves will tend to be the poor-doers and will lag behind their age group.

- No freebies
- No induced calves
- No twins
- Ensure calves are not lame or sick.
- Check that no navels are infected — check for swollen navels.
- No sunken eyes or droopy ears
- It is recommended to choose calves that are ideally a minimum of 37kgs in weight (except Jersey calves).
- Buy from a reputable farmer if purchasing calves
- Buy calves from as few sources as possible
- Develop a good relationship with your supplier/s
- Avoid buying mixed age groups where possible
- Calves must have had adequate colostrum from either their own mother or a mixed source of cows within the first 12 hours of life and look lively and strong, not lethargic or sore or have any visible signs of bleeding or lumps, especially around the navel.
- If buying calves in, ideally buy calves from farmers who take active steps to minimize disease threats such as rotavirus.

Important Guidelines for calf rearing

Achieve the best results possible.

1. Good selection criteria is important - buy only big, strong, healthy calves
2. Treat all navels for possible infection with iodine based spray after birth and transportation.
3. Feed adequate colostrum – ideally 10% of body weight (approx. 4L) within the first 6-12 hours.
4. Treat calves ONLY with electrolytes (2-4L) as the first feed on the day after transportation to reduce stress.
5. Feed the same brand of CMR the whole season – do not change except if completely necessary.
6. Follow the manufacturer's feeding guidelines and do not deviate unless consulted by the manufacturer or an expert.
7. Clean, fresh water ad lib along with fibre such as hay or straw must be available from day one.
8. Calves should be fed at the same time every day by the same person/people. Quality of care is vital and calves thrive on routine.
9. Feed changes or increases should be done gradually over 2-3 days to avoid scours.
10. Thoroughly clean feeding equipment especially milk feeders and teats as these harbour bacteria in spoiled milk residues.
11. Maintain a strict anti-viral spray programme at least twice a week and daily for sick animals.
12. Make sure there is adequate shelter for all calves and block off the prevailing wind.
13. Calves need to be kept dry inside at all times and have sufficient bedding that can be added to or changed when it's too fouled.
14. There should be enough ventilation through the barn/shed and if you get a strong ammonia smell then more ventilation is required.
15. Do not overcrowd pens. Allow 1.5square metres per pen. 10-12 calves is best but no more than 20 per pen or 100 per barn/shed. Always use multiple sheds.
16. Keep separate age groups i.e. younger and older
17. Control outside contamination such as birds and rodents and don't allow dogs in the sheds to wander from pen to pen.
18. Eliminate any free lying water, mud, drains or effluent from cowsheds around the calf sheds.
19. Carefully monitor calves daily to quickly identify sickness or problems – use a thermometer to check healthy calves first.
20. Contact your vet for any serious challenges you cannot fix yourself.
21. Autopsies and laboratory tests are useful to find the cause of death or illness to help prevent further problems.

Transport

It is very important when transporting your young calves from sales yards or a farmer's property that they are as kept warm as possible by putting a wind proof lining around the transport cage or trailer.

Wind chill can kill young calves especially if they are wet as this can lead to hypothermia or infection due to exposure.

Make sure to line the tray with hay or old carpet so they can lie down and have a softer place to fall if unbalanced. Having a soft lining helps reduce the chance of navel infection if the calf falls onto its stomach.

If calves are picked up late in the day, you can leave them in the transport pen upon arriving home so long as they are in a shed or shelter but there is no need to remove them until the morning when transferring them to their designated pens in the calf shed.

Housing and shelter

- Good housing or shelter goes a long way in protecting your calves and your investment, so do it right the first time!
- Choose a shelter that is protected from rain and is warm and draft free as calves will grow faster due to not using energy to stay warm.
- Ideally housing should face north to get sunlight as this warmth helps kill bugs and dry damp bedding that can cause infection or sickness.
- Where possible, make calf barns/sheds twice as long as they are wide to minimize draughts along the back regardless of the front being fully open.
- Do not make pens too big. A pen size of 5-6 or 8-10 calves is plenty depending on the size of the shelter but allow for 1.5 square metres per calf.
- Ideally calves should be kept inside for at least 4-5 weeks for beef rearers and 2-3 weeks for dairy heifer replacements.

Equipment

It is a must to have the right feeding equipment for feeding your animals so that they get the best advantage to grow and to make life easier on you, the rearer!

There are 6 key pieces of equipment:

1. Milk feeders - portable, open or compartment
2. Mixing buckets/drum/tank
3. Mixer or whisk
4. Cleaning brushes - tubes/teats and feeders
5. Thermometer
6. Tube Feeder - colostrum, milk, electrolytes

There are many other equipment pieces that are useful but these are considered to be the most important.

Whether feeding on a once a day or twice a day system, a compartment feeder is ideal in making sure each calf gets at least 2 litres per feed since the compartments hold 2 litres.

Cleaning utensils is crucial for eliminating bacteria and potentially harmful bugs in feeding equipment, especially teats and tubing.

A thermometer is possibly one of the most vital pieces you could own as taking the calf's temperature can be life saving for the calf and financial saving for you!

Tube feeders are essential for feeding colostrum into calves on dairy farms but are also used to administer milk and electrolytes when calves are sick.

Having good mixing facilities not only saves time but ensures no product issues with poorly mixed milk and ease of delivery to calf pens.

Critical Colostrum!

Colostrum is the life source for all baby animals and it is critical for young calves to receive it in the right amount within the right time period.

Colostrum is the first milk a mature cow produces after calving which provides the energy and immunity a baby calf requires to grow strong and healthy. It is high in immunoglobulins that help protect against infections, disease and scours and contains much higher amounts of protein, fat and some minerals than whole milk.

Calves are born with an underdeveloped immune system, so rely on colostrum to get a passive transfer (passed from animal to animal) from its mother's milk as the placenta does not allow antibodies to transfer this way.

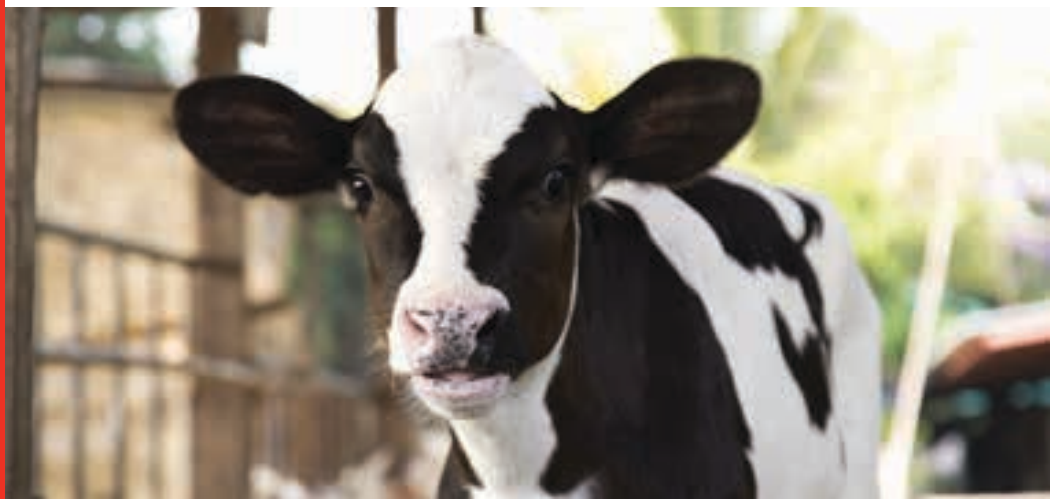
New born calves only have a 24hr window to absorb antibodies in colostrum, so that's why it is critical that they get a minimum of 2L within the first 6 hours of birth and a further 2L by 12 hours as for every 6 hours after that, the antibody transfer amount halves and is completely gone by 24 hours.

Feeding colostrum after the first 24 hours only provides gut protection but supplies large amounts of energy to the growing animal.

Feeding colostrum from mixed age cows is more preferable than from a single cow, as the quality and IgG levels can vary significantly especially with younger dams. Heifers' colostrum is usually the same as an older cow in terms of quality and IgG.

It is now reported that 50% of calves born in New Zealand do not receive any colostrum at all.*

* Wesselink R, Stafford, K.J Mellor, D. J Todd S, Gregory, N G. ***Colostrum Intake by Dairy Calves refs NVVJ Vol. 47 Number 1,*** Pages 31-34



If you are unsure that your four day old calves have had colostrum then you can test for it, but giving them colostrum at day 5 is not going to do anything for immunity protection but is solely to keep them alive and growing.

Colostrum testing must be done before the calf reaches 2 weeks of age!

Colostrum IgG levels table

Calf age - days	Adequate	Suspicious	Inadequate
1-3	>300	100-300	<30
3-10	>100	30-100	<30
10-15	>50	30-50	<30

Colostrum stores very well and will keep fresh for a week in cold weather or a refrigerator and it can be frozen for up to 6 months without affecting the antibodies. Thaw frozen colostrum slowly and not in a microwave as this will denature (make less effective) the antibodies.

If using powdered colostrum, only make up desired amount for each feed and discard if not all used. Do not chill and re heat the next feed or next day.

Fresh Colostrum vs. Whole milk

Fat	2 x that of whole milk
Protein	4 x that of whole milk
IgG	60 x that of whole milk
Lactose	same as whole milk
Vitamins	5 - 10 x that of whole milk
Energy	10% higher than whole milk

Feeding your calves

How to help your calves grow

- Upon arrival at home, feed calves an electrolyte supplement of about 2 – 4L/head as stress can cause scours and fluid loss during the ride home.
- On the first feeding day (day 5), calves should be started on the normal feeding regime you have selected.
- There are two options for feeding; the traditional 'Twice a Day' system or the milk restricted 'Once a Day' system.
- Mix CMR to the manufacturers label recommendation or contact them or an expert for advice.
- Mix the CMR prior to feeding and not the night before. This can lead to settling out and bacteria growth creating a source of infection.
- Always feed young calves warm milk so they do not use their energy heating cold milk to body temperature which reduces growth rates from wasted energy.
- Make sure the calves have access to fresh clean water, hay or straw ad lib for roughage and introduce meal straight away as well as the whole milk or CMR mixture to be fed on whatever system you have decided.
- Ideally use compartment feeders for the first 3-4 weeks, especially on a concentrated Once a Day feeding system.
- Calves can be weaned off milk once they achieve a 20kg weight gain over birth weight and are eating at least 1kg of meal/pellets.
- Feed a high quality meal/pellet to ensure consistent growth rates. Start with 20% protein and cut down to 13-16% once weaned to pasture.

Feeding systems

There are various types of feeding systems and feed supplements to rear your young calves on but deciding on what is best for you is a matter of trial and error based around experienced data and science.

Feeding calves is all about rumen development so the faster and most efficient way we can do this, is better for the calf and your pocket. To do this you need to feed milk and meal from day 5 onwards until it has transitioned fully to pasture.

CMR (Calf Milk Replacer)

CMR's are typically used by beef rearers who do not have access to whole milk but has also become a viable option for dairy heifer replacement rearers when colostrum or whole milk is in short supply and needing to be extended or is worth more in the vat!

There are two feeding options for CMR, the traditional 'Twice a Day' system and the milk restricted 'Once a Day' system, aimed at faster growth rates with less cost.

So let's take a look at how these are used and what they offer:

Twice a Day system: Traditional method

For years on NZ dairy farms and rearing operations, calves have been fed twice a day, once in the morning and once at night or early afternoon. Milk is usually fed at 2L twice a day for 2 weeks, 2.5L in weeks 3-4 and increasing to 3L twice by weeks 5-6.

Calves tend to take longer to get on to meal as they stay full for longer so have no need to eat large amounts of meal.

Due to slower rumen development calves are weaned later at around 8 weeks for beef rearers and 10 weeks with dairy replacements, so it can be a costly exercise but it may suit your farming practice better.

Once a Day system: restricted milk method

The Once a Day milk feeding system is designed to develop the rumen faster by restricting the volume of milk intake and promoting meal and pellet intake in higher quantities which is the part of feeding that stimulates the papillae (wall lining of the rumen) to encourage growth for absorption of the nutrients contained in both milk and meal.

The reason behind this is to convert a high cost and labour intensive milk fed diet animal to a pasture eating animal that will gain weight on grass due to the animals developed rumen that can process and utilize the nutrients efficiently.

In order to develop the rumen effectively, calves should be kept off pasture and fed only milk and pellets but make sure there is hay or straw available at all times for fibre intake which also helps with saliva production. This is important as the saliva produced buffers the rumen ph and has shown to encourage more meal consumption.

Twice a Day system - Mixing Rate = 125gm per litre

Age	Volume per day	Grams per feed	Grams per day	Daily Volume (L)
0-4 days	Fresh Colostrum or ExcelPlus Colostrum			
5-10 days	2L	250g	500g	4L
11-21 days	2.5L	312g	624g	5L
22 days to weaning	3L	375g	750g	6L

Once a Day system - volume remains at 2 litres

Age	Volume per day	Grams per feed	Grams per day	Daily Volume (L)
0-4 days	Fresh Colostrum or ExcelPlus Colostrum			
5-10 days	Follow twice a day feeding guide above			
11-14 days	2L	500g	500g	2L
15-21 days	2L	600g	600g	2L
22 days to weaning	2L	650g	650g	2L

Note: The mixing rate for the 'Twice A Day System' remains constant (125 grams per litre). The volume for the 'Once A Day System' remains constant (2L per day).

*Add CMR to half of the required volume and mix thoroughly. Top up with water to correct volume and temperature. Mix powder prior to feeding, not the day or evening before as settling can occur.

Fortification with CMR

Fortification of whole milk can be done when whole milk is in short supply or too valuable by using CMR to meet the daily nutrition requirements of the calf.

Mix up 125gms CMR per litre of warm water and add to the same volume of whole milk until the desired total volume per calf is reached.

For a concentrated alternative e.g. Once a Day, CMR powder can be added directly to whole milk at the same rate of 125gms per litre of liquid whole milk. This increases the nutrition value for the calf on a restricted volume basis.

Coccidiosis control in calves

Coccidiosis is an infection in the gut caused by protozoan.

This infection comes from sources such as faeces from adult stock, around water troughs, muddy faecal infected drains or puddles.

The usual symptoms of coccidiosis are bloody scours with mucous but are not commonly fatal, although it can severely affect growth rates.

Young calves from 3 weeks of age on, are more likely to contract this infection so always feed a CMR containing a coccidiostat like Milligans ExcelPlus, Milligans Classic and GOcalf Boost CMR's which have Bovatec added.

In conjunction with milk, feed a meal or pellet containing a coccidiostat (Rumensin, Bovatec) from day 5 onward, so calves take in the required daily amount to receive the preventative dose.

To keep protection at optimal levels, feed meal for at least 4 weeks after weaning from milk.

A cheap and simple test to detect coccidiosis is available from your veterinarian.

Hard feed and roughage feeding

Hard Feeds stimulate rumen function and prepare the rumen for an all grass diet which allows for a smooth transition from milk to pasture feeding.

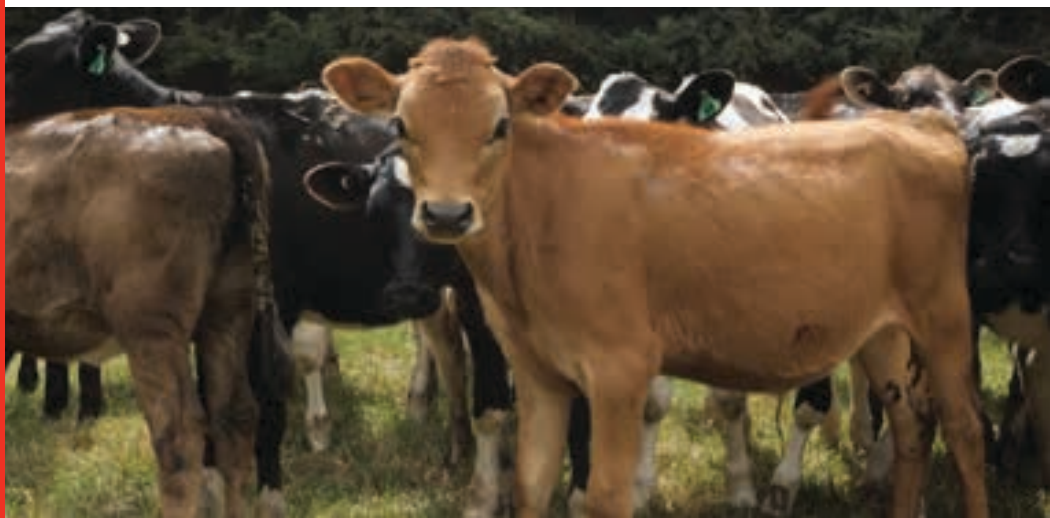
Fibre source

Fibre (hay and straw) contribute to rumen development but is lower in energy and therefore should not exceed more than 10% of the diet. Hay has higher energy, palatability and digestibility than straw. All fibre sources should be free of moulds and have a pleasant smell.

Feed source

The quality of the concentrate is very important as this will drive intake, affect milk feeding requirements, and the palatability of the feed. Characteristics of a quality feed are:

- Highly palatable and highly digestible
- Protein levels between 15-20% are recommended.
- A high protein level is required while the calves are indoors. When the transition to pasture occurs, this level can be reduced to save costs (but will not compromise growth rates)
- High in vitamins and minerals
- Contain flavour/sweetener to promote feed intake
- Should always contain a Coccidiostat (Bovatec, Rumensin).



Tips for feeding hard feed to calves

1. Offer hard feed ad-lib from day dot. Calves may not eat much in the first few days but it will get them used it and feed intakes will build with age.

Introduce calves to hard feed by feeding some by hand each day after their milk feed in the first few weeks of life. This will get them used to the flavour and texture.

2. Avoid dusty feeds — calves don't like eating dusty feeds.

3. Always make sure that fresh feed is put out for calves daily and that any older uneaten feed is removed.

4. Clean troughs very thoroughly regularly, wet compacted fed provides a favourable environment for mould growth and can put calves off feed.

5. Be aware of bird fouling contamination in feeders - plastic flaps or filling the trough in the evening may help

6. As feed consumption increases it is important allow space for simultaneous access to the trough. Allow 300mm of head space per calf

7. As feed intake increases, water intake increases – feed consumption will be limited if there is not sufficient access to clean ad-lib water

8. Ensure you are not overfeeding milk as this can fill up calves and decrease their hunger for hard feed.

9. Ensure unopened bags of feed are stored away from direct sunlight and away from possible vermin contamination in order to keep it as fresh as possible. Take the shrink wrap off pallets of calf feed as soon as it arrives.

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Weaning management

When calves are weaned onto pasture they should be growing at 0.8-1.0kg per day while on the meal.

- Calves can be weaned off milk when they are consuming 1.0 kg of feed for three consecutive days.
- Calves should not be weaned off milk until they are at least 65kg
- Wean via a graduated method where calves are gradually offered lower amounts of milk, this is the preferred method. Abrupt weaning can be a challenge for calves.
- Calves should be growing at 0.8-1kg per day and consuming 1-1.5kg of feed per day when weaned on to pasture
- Weigh a sample of calves to monitor target growth rates before making weaning or management decisions
- Weigh bands are a useful tool to approximate calf weights
- Do not wean calves during periods of additional stress, e.g. bacterial infection, dehorning, exceptionally hot or cold weather.
- Ensure high quality pasture is available
- Lower protein (15%) meal can be fed once calves are on pasture
- Continue to feed pellets at 1 – 1.5kg/calf per day for three – four weeks after weaning from milk (Approximately 10-12 weeks of age). This helps to maintain growth rates and protects calves against coccidiosis, which can often appear post-weaning.
- Feeding pellets beyond this stage can also be beneficial particularly if environmental conditions and/or pasture quality is poor.
- Clean, fresh water is a must after weaning off milk and while on the new pasture and feed diet.
- Make sure shelter is still available after milk weaning e.g. hedges or shelter belts.

Hygiene

This is the most important part of rearing with calves being so susceptible to disease and infection!

You must –

Thoroughly scrub feeding equipment including feeders, buckets, teats and mixing utensils with HOT water and detergent or sanitiser.

Use a broad spectrum disinfectant to spray pens at least twice a week taking care to avoid spraying feed troughs, water and of course calves.

Regularly clean areas where sick calves have been treated and spray after each clean.

Make sure you have a spare gate or partition to use as a barrier within the same pen for sick calves. The likelihood that the other calves are already infected is high so moving them just spreads the sickness quicker through the calf shed.

Wear easy to clean waterproof clothing especially around sick calves.

Do not use high pressure hoses around the calf sheds as this can create an airborne mist that can be breathed in and may cause disease.

Scours – Prevention and treatment

Scours are usually either Nutritional or Infectious.

Nutritional can be from stress, cold, low IgG or poor milk/CMR quality.

Infectious is usually from rotavirus, coronavirus, cryptosporidium or bacterial.

The treatment is exactly the same which is feeding 8-10 litres of electrolytes per day.

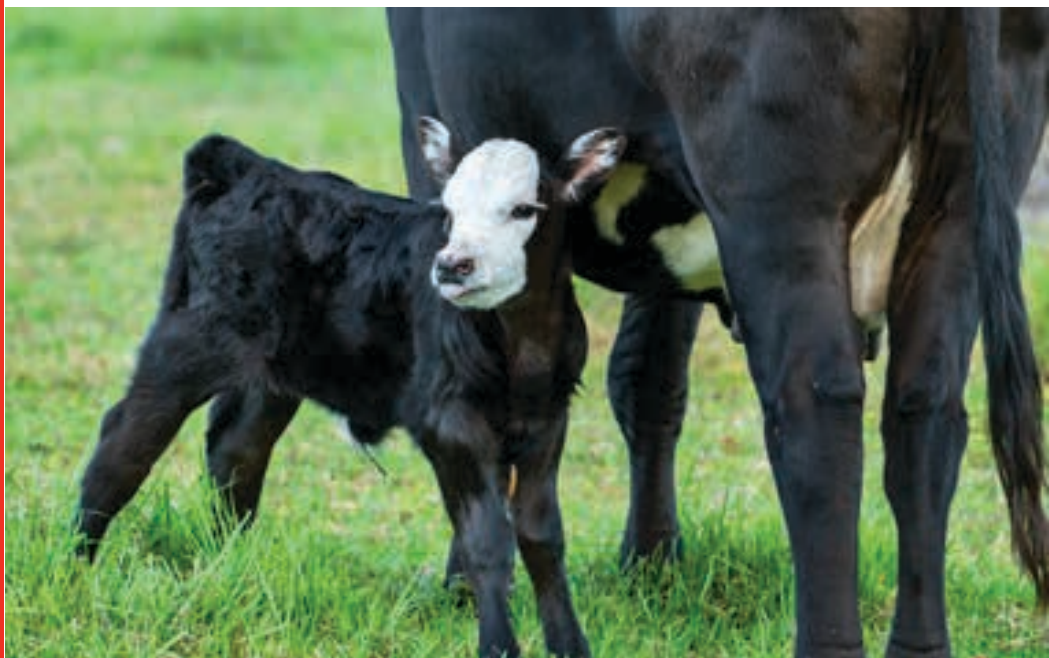
It is important to maintain fluid and energy levels with electrolytes and milk due to electrolytes not supplying enough calories to keep the calf's energy levels up and keep it holding weight.

Whole milk and CMR provide 1700 – 2100 kcals per 3L whereas electrolytes provide between 500 – 1000 kcals per 4-6L, so milk must be fed in conjunction with electrolytes or the calf will die from dehydration due to severe fluid and weight loss.

Electrolytes should be given at the percentage of weight loss to replace the fluids plus its maintenance amount which is 10% of the weight of the healthy animal e.g. 40kg calf = 4.0 L milk.

Note: make sure of at least 2 hours between feeding electrolytes and milk, DO NOT feed at the same time!

Remember... calves die from dehydration and lack of energy NOT DIARRHOEA!



Scours – Prevention and treatment

continued...

Fluid replacement amounts for a scouring calf - 40kg Calf

Degree of dehydration %		Maintenance water required ltr/day	Total fluids required ltr/day
2%	0.8 L	4.0 L	4.8 L
5%	2.0 L	4.0 L	6.0 L
10%	4.0 L	4.0 L	8.0 L

A recommended Electrolyte therapy should look like this:

Moderate scours -

8am	Noon	4pm	All night
Milk 1-2 litres	Electrolytes 2 Litres	Milk 1-2 Litres	Electrolytes Ad lib 4-6 litres

Total: 6 – 10 litres

Severe scours -

8am	Noon	4pm	All night
Electrolytes 2 Litres	Milk 1-2 Litres	Electrolytes 2 Litres	Electrolytes Ad lib 4-6 litres

Total: 6 – 12 litres

Moderate scours should usually be gone within 2 days and severe scours 3-4 on these feeding plans. If scours persist, contact your vet.

Try to avoid giving antibiotics unless advised by an expert after animals have been assessed.

Antibiotics can strip the gut of the 'Good' bacteria or micro flora that aid in the digestive stage. If you need to use antibiotics at any stage then it is recommended that a probiotic be given to replace and build up the good bacteria population so the calf does not suffer too much of a growth check.

Feed electrolytes warm as you would milk as this will increase voluntary suckling/ drinking.

Offer electrolytes by teat feeder, bucket or trough and if calf will not drink at all due to low energy, use a tube feeder.

Other products such as Sodium Bentonite (Trubond or Rumenite) etc have a good effect on scouring calves and should be a standard additive used over the pellets or meal from day 4.

We recommend using Milligans ExcelPlus CMR as the gut conditioning package is designed to reduce the possibility of scours due to a stronger, healthier gut.

Calf Health - what to look for

Symptom	Possible reason
Clean nose	should be moist, cool and clear of discharge.
Dull coats/tight skin	if you pinch the calf's skin and it's slow to return to normal, it may be dehydrated and require electrolytes.
Poor appetite	could be several things including twisted bowel, sore mouth, has temperature from infection or disease
Bloat	gorging or overdrinking, drinking cold milk – spill into rumen, clostridia disease
Scours – nutritional:	usually has normal temperature as is eating normally but faeces are white or yellow.
Scours – infection:	usually a yellow or brown colour that can sometimes contain blood, and has a bad odour. Temperature is usually elevated.
Blood in faeces	this can be normal for the first few days after birth.
Swollen navel	could be a hernia, infection or pizzle sucking from other calves?
Trouble standing	Diarrhoea, sore joints (infection), injury
Shivering	calf is cold from wet and/or draughty housing, poor shelter, inadequate bedding or feeding cold milk

The normal temperature of a calf is between 38.0 – 39.3˚c

Remember, if in doubt, contact your vet!

Common illness and disease causing agents

Infectious agents	Symptom and treatment
E Coli	Severe scours and death within first 3 days for low IgG calves. High temperature >39.5˚c.Treatment: Antibiotics – but are usually too late, feed electrolytes. See rehydration notes.
Cryptosporidiosis **	Typically contracted in the first 10 days and sometimes in conjunction with Rotavirus. Signs - Severe scours, yellowish and watery and affecting up to 100% of calves. High temps >39.5˚c. Treatment: Treat early with rehydration plan usually for 2-3 days.
Rotavirus **	Severe yellowish watery scours, bad smelling and containing mucous, but no blood. Is very contagious and is extremely hard to stop from spreading. Usually 3 days scouring with high temps >39 5˚c. Calves can grow well once recovered. Treatment: Antibiotics are no use. Quick action and rehydration treatment is the key to low mortality rates. See rehydration notes.
Campylobacter**	Severe, bad smelling, watery scours within the first 3 weeks. Usually from an infected water source. Keep away from puddles or stagnant troughs. Treatment: antibiotics are no use so treat with rehydration plan. See rehydration notes.
Corona Virus	Severe scours from 2-3 week time period. Usually appears in conjunction with rotavirus and crypto. More of a secondary, opportunist virus with low mortality. Treatment: Treat as per Rotavirus. See rehydration notes.

Common illness and disease causing agents

Infectious agents	Symptom and treatment
Salmonella **	Severe diarrhoea from bacterial infection. Can have high mortality rate at 20% plus. Faeces contain mucous and blood, very smelly and calf has high temp >39.5˚c. Rapidly spread from pen to pen and can be fatal before scours are evident. Treatment: Treatment depends on how quick the issue is identified and usually with an intense course of approved antibiotics and maintenance levels of electrolytes and milk. See rehydration notes.
Coccidiosis	Contracted from about 3 weeks of age onward but can be earlier. Scours may appear sporadically and usually green but can contain blood and mucous. Signs are calf straining with blood around tail and rectum. Temperature is mostly normal and while not usually fatal, can severely check growth rates in the following weeks. Treatment is actually prevention by feeding milk and/or meal with coccidiostat and contact vet if required.

Note – agents marked with a double asterix ** are diseases or illness that can be contracted by humans and dogs so it is very important to keep children and pets away or out of the calf sheds. Since these agents are extremely contagious, consult your doctor immediately upon signs of vomiting, diarrhoea or stomach pain, especially with children.

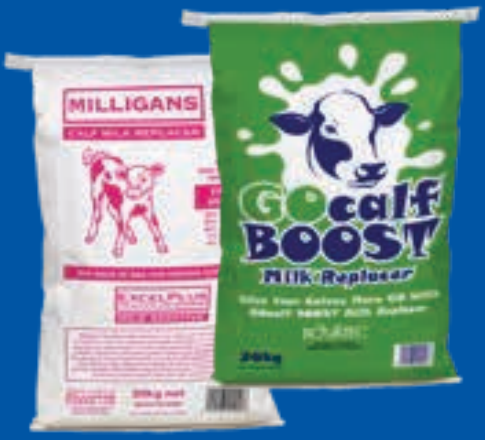
Key Points: a summary

1. Make sure everything is prepared for the calves' arrival on farm including calf shed, bedding, feeding equipment, hot water, fresh cold water, meal, CMR or whole milk supply, electrolytes etc.
2. Only buy calves above 37kg (excl Jersey breed).
3. Do not accept freebies or buy sickly looking calves with wet umbilicus.
4. Feed electrolytes or milk immediately after transport ride back to the farm. Feed no more than 2 litres per feed.
5. Have shelter and bedding all sorted before getting calves.
6. On day 5 start feeding on the system that suits you and your budget.
7. Feed calves at the same time of the day whether on a Twice a Day or Once a Day system – like humans, calves thrive on routine.
8. Be vigilant with hygiene i.e. spray and clean pens and equipment regularly.
9. Keep calves of same age together and keep an eye on slower drinkers as they should be penned together.
10. Check calves regularly for health issues e.g. navel infections, scours, dehydration, lethargy and treat accordingly as quickly as possible.
11. Use a thermometer on any calves you suspect of having an infection or raised temperature.
12. Keep dogs and other farm animals out of the calf pens to avoid spreading any possible bacteria.

Where to buy?

Milligans Feeds range of products are available from Farmlands nationwide and selected leading rural merchant stores and vets across the country.

If you still cannot find where to buy have a look on our website or call us on 0800 STOCKFEED.



Milligans + ExcelPlus™

Calf Milk Replacer with ExcelPlus™ Milk Additive and Bovatec

This is Milligans Ultra-Premium calf milk replacer which contains ExcelPlus Milk Additive, a unique premix comprising of conventional minerals and vitamins at optimum levels, and a blend of natural essential oils, plant extracts, functional fibre and a pre-biotic.

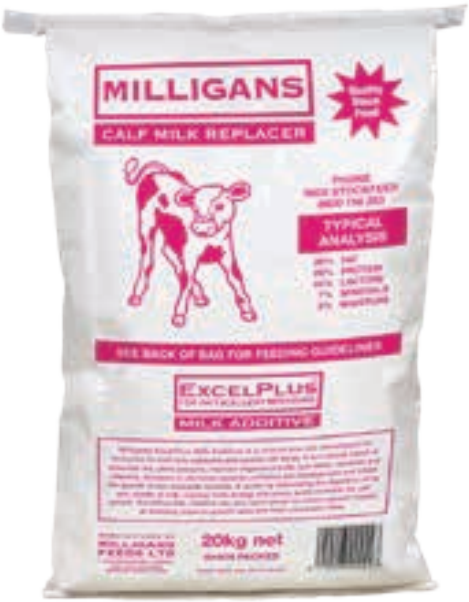
Milligans + ExcelPlus can be fed to calves from day 4. As with all animals, colostrum should be fed for the first 4 days before starting them on a CMR such as Milligans ExcelPlus.

Milligans + ExcelPlus is made from a blend of casein based dairy ingredients blended to meet the nutritional requirements of young calves and contains a boosted vitamin and mineral premix to maximize calf health.

Bovatec is added as an aid in the prevention of coccidiosis. (See page 10 for coccidiosis information)

Milligans + ExcelPlus is a premium quality, highly digestible milk replacer that can be fed on either the Once a Day or Twice a Day feeding system. It can also be fortified with colostrum or whole milk to extend its feeding time.

ExcelPlus Milk Additive is exclusive to Milligans for the use in CMR and will give your calves the best start to life.



TYPICAL ANALYSIS	
20%	FAT
26%	PROTEIN
44%	LACTOSE
7%	MINERALS
3%	MOISTURE

Milligans Classic

Calf Milk Replacer with Bovatec

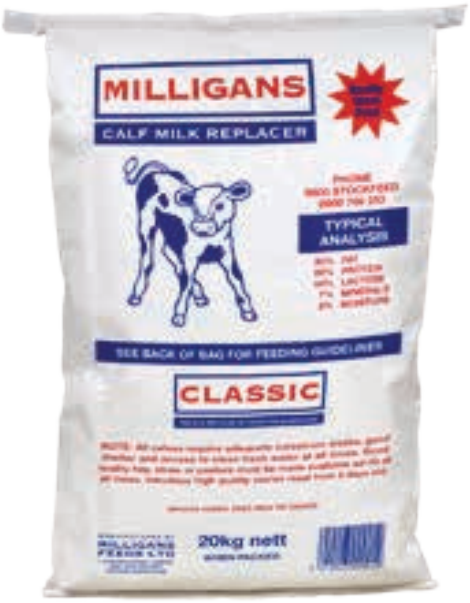
This is Milligans Premium calf milk replacer which has been the milk replacer of choice for generations.

Milligans Classic can be fed to calves from day 4. As with all animals, colostrum should be fed for the first 4 days before starting them on a CMR such as Milligans Classic.

Milligans Classic is made from a blend of casein based dairy ingredients blended to meet the nutritional requirements of young calves and contains a vitamin and mineral premix to maximize calf health.

Bovatec is added as an aid in the prevention of coccidiosis. (See page 10 for coccidiosis information)

Milligans Classic is a premium quality, highly digestible milk replacer that can be fed on either the Once a Day or Twice a Day feeding system. It can also be fortified with colostrum or whole milk to extend its feeding time.



TYPICAL ANALYSIS	
20%	FAT
26%	PROTEIN
44%	LACTOSE
7%	MINERALS
3%	MOISTURE

GOcalf BOOST

Economy Calf Milk Replacer with Bovatec*

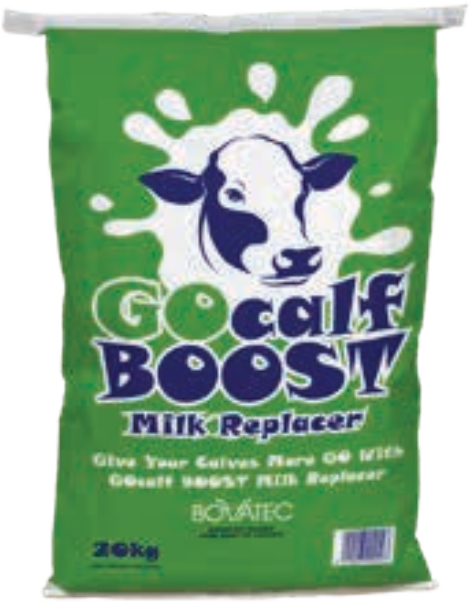
This CMR manufactured by Milligans is a basic blend made from quality milk powders designed to meet the nutritional requirements of young calves.

GOcalf can be fed to calves from day 4 but is better suited as a two-stage product due to its lower protein content. As with all animals, colostrum should be fed for the first 4 days before starting them on a CMR such as GOcalf.

GOcalf is made from a blend of ingredients to meet the nutritional requirements of young calves and contains a vitamin and mineral premix to maximize calf health.

Bovatec is now included in the GOcalf range added as an aid in the prevention of coccidiosis. (See page 10 for coccidiosis information)

GOcalf is a quality economy milk replacer, that can be fed on either the Once a Day or Twice a Day feeding system. And is an excellent two stage product if initially feeding whole milk, colostrum or premium Calf Milk Replacer such as Milligans ExcelPlus or Classic and completing the rearing up to weaning with GOcalf. It can also be fortified with colostrum or whole milk to extend its feeding time.



*If users wish to feed a CMR without a coccidiostat as part of their CMR feeding programme, GOcalf without Bovatec is also available.

TYPICAL ANALYSIS	
20%	FAT
22%	PROTEIN
48%	LACTOSE
6%	MINERALS
3%	MOISTURE

GOcalf WHEY

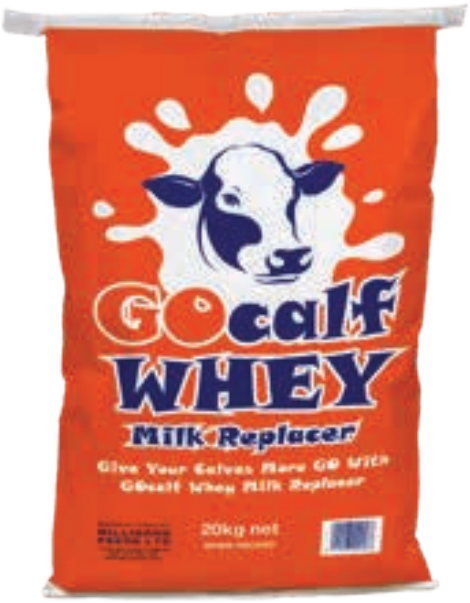
Whey Calf Milk Replacer

This CMR manufactured by Milligans is a quality Whey CMR designed by Milligans for New Zealand conditions.

GOcalf can be fed to calves from day 4 but is also suited as a two-stage product. As with all animals, colostrum should be fed for the first 4 days before starting them on a CMR such as GOcalf Whey.

GOcalf is made from a proven blend of whey proteins, vegetable proteins, and highly digestible vegetable oils developed by Milligans. GOcalf Whey also contains a formulated vitamin and mineral premix to maximize calf health.

GOcalf Whey can be fed on either the Once a Day or Twice a Day feeding system. And is an excellent two stage product if initially feeding whole milk, colostrum or premium Calf Milk Replacer such as Milligans ExcelPlus or Classic and completing the rearing up to weaning with GOcalf Whey. It can also be fortified with colostrum or whole milk to extend its feeding time.



TYPICAL ANALYSIS	
20%	FAT
20%	PROTEIN
48%	LACTOSE
8%	MINERALS
3%	MOISTURE

ExcelPlus™ Colostrum

High IgG colostrum powder

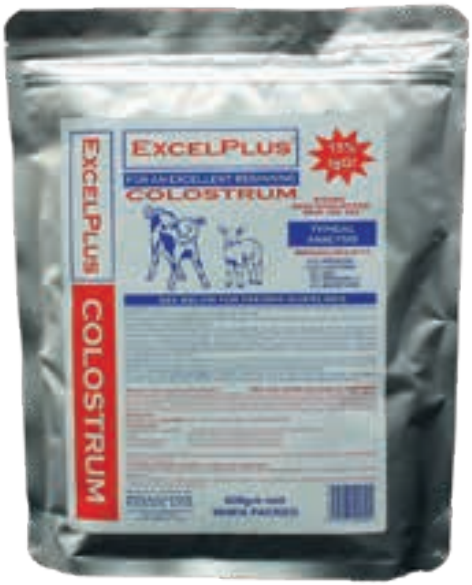
ExcelPlus Colostrum is a premium quality colostrum powder specially formulated with high IgG (immunoglobulin) levels and is nutrient rich with added vitamins and minerals to help support early growth and development of new-born animals.

Colostrum is known as the "white gold" of first nutrition for newly born animals and it is most effective within the first 24hrs of birth for the transfer of immune boosting anti-bodies. After this period, the absorption rate is near zero and the function of colostrum then only becomes useful for localised gut and intestinal health or energy source.

ExcelPlus Colostrum is a premium quality source of colostrum for a range of animals and can be used either as the sole colostrum source, or in combination with fresh colostrum. It can also be fortified with fresh colostrum.

Suitable for Calves, Lambs, Goat kids, Foals, Alpaca Cria, Piglets

Product Available in 600g foil sachets or made to order in 15kg size



TYPICAL ANALYSIS	
15%	IMMUNOGLOBULIN
52%	PROTEIN
25%	LACTOSE
8%	FAT
6%	MINERALS
3%	MOISTURE

ExcelPlus™ Electrolyte

Electrolyte rehydration powder

ExcelPlus Electrolyte is a therapeutic re-hydration powder, designed to enhance water absorption and aid recovery from dehydration due to diarrhoea by replacing the lost mineral salts.

Formulated from high quality ingredients, ExcelPlus Electrolyte is designed to give your animals that much needed boost when required.

Dehydration from diarrhoea is one of the most common causes of death in young animals so use ExcelPlus Electrolyte as soon as signs appear.

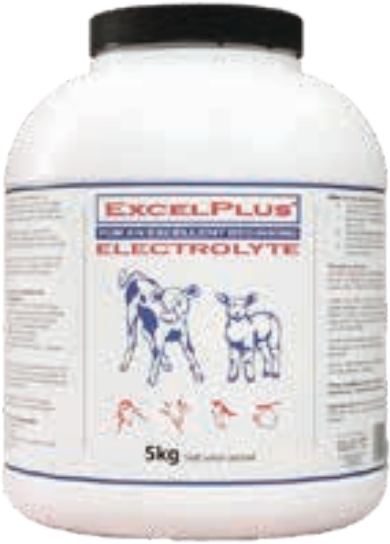
ExcelPlus Electrolyte contains the essential ingredients:

- Dextrose & Lactose – for an instant energy boost which encourages drinking and feeding.
- Bicarbonate – pH buffer and gut modifier for enhanced recovery.
- Sodium, Chloride and Potassium - vital electrolytes in optimal amounts. Vitamin A –an important vitamin to enhance natural immunity and health.

ExcelPlus Electrolyte benefits:

Fast acting energy source, safe and non toxic, nil milk withholding (even for bobby calves), mixes easily in water

ExcelPlus Electrolyte is suitable for calves, horses, lambs, kids and cria (infant alpaca)



Directions for use:

Simply add 80g of ExcelPlus Electrolyte to 1 litre of water. Shake or stir vigorously and top up to 2 litres for 1 standard dilution. Feed electrolytes warm between 20 - 30˚c.

Please see the rehydration table for calf requirements and dose rates on page 14. See product label for all other animals.

Calf rearing economics worksheet

Rearing Input	Amount - item, litre or kg	Unit cost (cents)	Total cost $$
Colostrum			
Whole milk			
Calf Milk Replacer			
Meal			
Straw			
Pasture			
Bedding			
Ear tags			
Freight/Fuel			
Health			
De-horning			
Labour			
Power			
Capital			
R & M			
Interest			
Miscellaneous			
Total cost $$/calf			
$$/kg Lwt gain			
Sale price			
Profit per calf			

MILLIGANS
FEEDS

Address	1 Chelmer Street Oamaru, 9400
Postal	P.O. Box 85 Oamaru 9444
Phone	03 433 1113
Fax	03 434 1119
International calls	+64 3 434 1113
E-mail	feedsales@milligans.co.nz
Freephone	0800 STOCKFEED
Website	www.milligansfeeds.co.nz