



CALF REARING GUIDEBOOK

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Dairy for life

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INTRODUCTION

NZAgbiz is the leading supplier of calf milk replacers to the New Zealand market.

All of our products outlined in the calf rearing booklet are available through all rural retailers nationwide.

This calf rearing booklet is designed to assist calf rearers. There is no one way to rear calves and because of this our suggestions are broad based, to encompass all rearers.

In the booklet you will find information on products, financial considerations, best calf rearing practices from arrival to weaning and a trouble shooting guide to minimise risk in your calf rearing system.

We hope that this booklet helps you in your calf rearing endeavours, and we wish you all the best for the forthcoming season.

For further information on feeding please call NZAgbiz on **0800 809 011** or visit our website **www.nzagbiz.com**.

From the team at NZAgbiz.

FONTERRA MILK REPLACER QUALITY STANDARDS

Fonterra Co-Operative Group manufactures their products to meet the quality standards approved by the New Zealand Food Safety Authority.

Calves can perform and stay healthy on products made from a range of milk based materials. Milk based raw materials provide the least risk to calf health and performance.

All Fonterra products are formulated using milk based ingredients. The traditional products are derived from cow's milk only and so contain only Whey and Casein Proteins, Butterfat and Lactose. Denkavit Whey adds another high quality alternative to the market. Formulations are correctly balanced and feeding programmes are tailor made to ensure an optimum end result is achieved. Health, growth, economics, genetics, husbandry and environmental factors are all considered in making these nutritional decisions.

Fonterra powders are free of hormones and antibiotics and only contain natural performance enhancers (eg Supagest).

Quality and price issues are balanced carefully to avoid compromise.

"Providing the Fonterra Assurance of quality and supply"

CALF REARING GUIDEBOOK

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GUIDELINES for successful calf rearing

1. Initial selection criteria need to be clear to produce good strong calves. Start with a strong healthy calf.
2. Treat navel with an approved iodine solution immediately after birth and following transportation, to prevent infection.
3. Colostrum must be fed to calves within the first 10 hours, ideally 4 litres (10% of the body weight) in the first 12 hours.
4. De-stress calves after transportation. It is highly recommended that only electrolytes (about 4 litres) should be offered at the first feed.
5. When feeding CMR, always follow instructions carefully:
 - Don't overfeed, over or under concentrate powders.
 - Follow manufacturer's and/or expert advice.
6. Clean, fresh ad lib water and a fibre source (hay or straw) must be available from day one.
7. Bring milk to calves, not calves to milk. Keep milk lines as short as possible.
8. The same person(s) should feed the calves at the same time each day. Caring quality staff is important.
9. Use one brand of CMR throughout the feeding programme.
10. Ensure feed increases/changes are made gradually. If required make changes only every 3 days.
11. Calves must be dry at all times.
12. The rearing area must be kept dry and draught free.
13. Shelter should be available for all calves. Best is an open ended barn with the open end away from the prevailing wind.
14. Adequate ventilation is essential. There should be no smell of manuregases.
15. Separate age groups (ie older from younger calves).
16. Keep calves away from adult stock and as far away as possible from cowsheds and feeding pads.
17. Don't over crowd pens or barns. As a guide allow 1.5 square metres per calf. 10 calves per pen is best, but no more than 20 per pen or 100 calves per barn. It is always best to use multiple barns.
18. Ensure a good hygiene programme. Spray the barns with a complete anti-viral product twice a week and daily for sick calves.
19. Ensure adequate bedding (bark/straw/sawdust/woodchips) is provided and topped up regularly.
20. Control rodents and birds. Do not allow dogs to wander from pen to pen.
21. There must be no free lying water, mud, drains, swamp or cowshed effluent near the calf barn and weaning areas.
22. Carefully observe all calves daily to identify problems as early as possible. The use of a clinical thermometer is essential to identify sick calves and to monitor treatments.
23. Isolate and treat sick calves as early as possible. Use approved antibiotic and electrolytes at proper therapeutic levels.
24. Autopsies and laboratory tests are very useful to find the cause of death or illness and to prevent further problems.
25. For all serious health challenges, and disease prevention consult your vet.

**For further information or advise contact
Customer Services on 0800 809 011 or visit www.nzagbiz.com**

ECONOMIC decisions for calf rearing

There is no one way to rear calves. You should select a system to suit your needs and resources. However it is important you consider all of the issues listed below. Ultimately there must be economic gains so be sure to fill out the worksheet on the next page.

Decisions will be based on

- 4 day old calf prices
- 100kg weaner prices
- Beef schedules and demand
- Availability and price of colostrum
- Availability and price of whole milk
- Calf milk replacer pricing
- Number of calves reared
- Type of calf reared (ie; bull to slaughter or heifer replacement)
- Facilities that are available for rearing
- Breed specific criteria
- Decisions on capital expenditure for facilities
- Allocation of pasture and labour resources
- Target liveweight-for-age objectives
- Use of milk, meal and pasture feeding combination and expense
- Weaning policy adopted

calf rearing economic **WORKSHEET**

Rearing cost	Amount Kg or litre	Unit cost (c)	Total Cost (\$)
Colostrum			
Whole Milk			
Calf Milk Replacer			
Meal			
Pasture			
Straw			
Bedding			
Losses			
Health			
Labour			
Power			
Interest			
R & M			
Capital			
Miscellaneous			
Total cost \$/calf			
\$/kg Lwt Gain			
Sale Value			
Margin per calf			

calf milk replacer

FEEDING GUIDELINES

- Mix milk powder prior to feeding, not the day before as settling can occur and milk can go off from bacterial growth creating a source of infection.
- Store opened bags of milk powder in a dry, cool, rodent free environment to avoid contamination or spoiling.
- Mix powder thoroughly in warm water. Add milk powder to half the final volume, mix well and then top up to the required volume with warm or cold water as required.
- Use a thermometer if you are unsure of correct temperatures.
- Always use clean fresh water.
- Rinse and clean all equipment thoroughly after every feeding and disinfect equipment regularly. Ensure teats do not become blocked.
- Increase feeding levels in stages making changes every third day to prevent nutritional scours.
- Warm milk, as opposed to cold milk is desirable as energy will not be consumed heating cold milk up to blood temperature for easy digestion.
- Do not overfeed, under or over concentrate milk powder. Follow the manufacturer's guidelines.
- Be observant at feeding. Teats may block, bullying may occur in compartment feeding, watch for slow feeders.
- Ideally, use a compartment feeder for the first 3 weeks, especially when feeding concentrated milk, as in the once a day system.
- Ensure a consistent feeding time, preferably with the same person feeding the calves.
- Ensure that clean ad lib water is always available, especially when feeding concentrated milk as in a "once a day" feeding system.

calf milk replacer

FEEDING INSTRUCTIONS

Twice a day feeding

Suggested feeding rate and volume - mixing rate 150 grams/litre

Age	Volume per feed* (150g/litre water)	Grams per feed	Grams per day
0-4 days	Colostrum fed ad-lib		
5-10 days	2.0 litres	300 grams	600 grams
11-21 days	2.5 litres	375 grams	750 grams
22 days to weaning	3.0 litres	450 grams	900 grams

* Add CMR to 1/2 the 'volume per feed' and mix thoroughly. Top up with water to correct volume and temperature

- Calves are usually fed in the morning and again in the evening, or ad-lib.
- As a guide, 8 hours should elapse between feeds.
- Mixing concentration is constant throughout the rearing.

Once a day feeding

Age	Volume per feed*	Grams per feed	Grams per day
0-4 days	Colostrum fed ad-lib		
5-10 days	1.0 litres twice a day	300 grams	600 grams
11-21 days	2.0 litres once a day	600 grams	600 grams
22 days to weaning	2.0 litres once a day	700 grams	700 grams

* Add CMR to 1/2 the 'volume per feed' and mix thoroughly. Top up with water to correct volume and temperature

- Once a day feeding systems work by restricting the feeding volume and increasing the concentration of the milk. This encourages the earlier consumption of concentrates, whilst the full nutritional requirements are met.
- Because low volumes are fed it is critical to use a compartmentalised feeder to ensure an even accurate intake.
- Calves can be weaned off milk at a minimum of 65kg and / or when consuming 1kg of concentrate. Continue to feed concentrates at the rate of 1.5 - 2.0 kg/day for the next month or until 100kg liveweight.
- Later weaning will contribute to a greater increase in growth rates.

FORTIFICATION

Where whole milk availability is limited, or too valuable, Calf Milk Replacer (CMR) can be used in conjunction with the whole milk, to meet the daily feeding requirements of the calf.

This can be achieved by mixing CMR powder with water at a rate of 150 grams per litre and then combining with the whole milk to reach the desired feed volume.

Where a concentrated feed is required, e.g. calves on a "once a day" system, CMR powder can be added directly to the whole milk at a rate of 150 grams per litre of whole milk. This will increase the nutritional value of the whole milk and ensure that the calf is achieving its daily nutritional requirements.

NB. A typical litre of whole milk is, on average, equivalent to 150 grams of CMR powder.

COMPARISON between twice & once a day feeding

Twice a day feeding	Once a day feeding
Milk fed twice a day	Milk fed once a day
Volumes fed up to 6 litres/calf/day	Volume low 2 litres / day
Milk not fortified with extra CMR	Milk fortified. NB. liquid milk and/or colostrum can be fortified directly or by adding CMR @ 150 grams/litre
Feed approx 20 - 30kg CMR per calf	Feed approx 20kg of CMR per calf
Calf tends to eat smaller quantities of meal (40-50kg)	Ad-lib access to meals will increase meal intakes to 75 - 90kg per calf
Calves have access to pasture from 2-3 weeks	Pasture is often restricted until week 5 - 7 to encourage early meal intakes
Slower rumen development	Rapid rumen development
More labour intensive	Less labour intensive
Environmental conditions less controlled when outside	Environmental conditions can be controlled for optimal performance
Calves weaned to pasture earlier are hardier at the same age	The transition from meal to pasture requires care
Water should be freely available	Ad-lib access to additional water in the barn is essential

NB: In both systems a coccidiostat is required in the meal to fully control scours from Coccidiosis before and after weaning off milk.

calf rearing **BEST PRACTICES**

Selection criteria for successful calf rearing

Follow these calf selection criteria to get that head start.

- No twins
- No induced calves
- No freebies
- Umbilicus must be dry
- Eyes not sunken
- Ears not droopy
- Use breed-specific criteria
- Be smart and pick the obvious strong animals
- Ideally calves should be over 40kg at 4 days (excl. Jersey calves)
- Avoid the use of antibiotics
- Buy calves from as few sources as possible and ensure suppliers are reputable
- Develop good relationships with your supplier(s)
- Avoid mixing age groups of calves where possible
- Ensure calves have received colostrum within first 12 hours

Ideally buy calves from a herd vaccinated against Rotavirus

The rearing facility

- Provided calves are dry and in a draught free environment they can cope with lower temperatures, so provide adequate shelter to prevent draughts. Trials indicate there can be up to 20% difference in growth rates between sheltered and non-sheltered calves.
- Do not expose calves to wind and rain.
- Provide protection from a prevailing wind.
- Ideally shelter should be twice as long as it is wide to minimise draughts at the back, even if the front is fully open.
- Cover the floor surface with untanned sawdust, shavings, post pelling or wood chip to a depth of 200 - 300mm or more.
- Ensure the floor drains properly. Ideally have it higher at the back and lower at the front. A drain at the front to remove effluent and water is essential to prevent pooling of water and mud at the front of the barn. Coil drains placed in sand or river metal under the bedding is helpful to remove excess urine (ammonia)
- Top up bedding area regularly to ensure it remains clean and dry.
- If you are using grated floors similar to those found in woolsheds, use wind or shade cloth over the slats and cover with bedding as before.
- Ensure a minimum of 1.5 square metres/calf, ideally minimise calf contact between pens. Best is 10 calves/pen with a maximum of 20 calves per pen. Calves are less stressed and more content in smaller groups and drinking intakes are more easily monitored. It also makes the observation of individual calf health easier. Ideally no more than 100 calves per barn (per environment), so have more than one barn. This allows for easier separation of age groups and feeding levels. This provides a safety barrier between barns in the case of disease outbreak. Allows a barn to be rested for cleaning and sterilisation between batches.
- Do not use a high pressure hose inside the barn, as this will aerosol bacteria and viruses to calves in adjacent pens - a broom will easily remove excess materials in laneways.

calf rearing

BEST PRACTICES

The rearing facility continued...

- Good ventilation is essential. There should never be a smell of Ammonia in the barn. Lack of ventilation is most critical at the floor and calf height level. Provide ventilation where the walls meet the ceiling. It is always easier to ventilate across the barn, not down the length of the barn. Ventilation should be adaptable for weather conditions with gaps, interrupted boarding, removable shutters or wind cloth. Through the roof ventilation with fans is rarely effective.
- Provide a water trough to each pen. The water must be clean and of good quality. Troughs should be checked and cleaned daily. Remember that calves will require 2 - 6 litres of additional water per day under hot conditions, where restricted feeding systems are used, with high meal/ fibre intakes or during episodes of scours.
- Meal troughs should be long enough to give at least half the calves free access to the trough at anytime. As a rule of thumb provide 300mm of trough space per calf.
- Keep milk lines as short as possible - no stale milk left in hoses between feeds.
- Control rodents and birds as much as possible. They are the biggest spreaders of disease in the barn.
- Ensure you have a designated area where you can isolate sick calves, as this will minimise risk of diseases spreading.

Caring for new arrivals

- Check and spray (if necessary) the navel cord daily for the next 3 days. Start initial feeding 2 hours later with milk or electrolytes, no more than 2 litres per feed.
- The addition of a curding agent like Rennet, yoghurt (lactobacillus, acidophilus) is beneficial in the transition to the new diet and environment.
- Check teats quality and numbers. Best practice is to have several spare teats per feeder i.e 8 calves to a 10 teat feeder.
- Check for slow drinkers, and if necessary reassign calves on drinking speed and vigour.
- Warm Feeding (30 - 40oC) of milk or electrolytes will encourage fluid intake and prevent nutritional upsets.
- A gut modifier like sodium Bentonite (in the meal trough) is useful.
- Check the calf's temperature if signs of illness is suspected. These signs may be calves dull, depressed, slow drinking, reluctant to stand/walk, or scours.
- The normal temperature for a calf is between 38 - 39oC. If in doubt consult your vet.
- Check Faeces at each feed for colour, smell, consistency or the presence of blood.

Cleaning the rearing area

- Do not use a high pressure hose anywhere near the calf pens.
- Calves must not be splashed by manure waste. This aerosols the bacteria/ viruses in a polluting mist. Ingestion or the breathing in of these pathogens may cause disease.
- Spray the rearing area including feeding utensils and teats with approved virucidal product at least twice a week. Daily during a disease outbreak.

calf rearing **BEST PRACTICES**

Colostrum

Colostrum is the starting block to disease prevention. Calves should receive colostrum - at least 10% of their body weight (about 4 litres) in the first 10 hours. That is 2 litres within 4 hours after birth and another 2 litres within 10 hours. The protection to the calf is by the immunoglobulins (IgG) in the first milk. However these IgG levels drop by 75% in subsequent milkings. Colostrum is also high in fat and protein and so is a high source of energy for the new born.

Fresh Colostrum versus wholemilk

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

- Colostrum can be frozen or stored for long periods with out damage to the immunoglobulins.
- Stored colostrum may be preserved with lactobacillus, yoghurt or a colostrum keeper. The stored product must be stored in a cool place and stirred twice a day.
- Colostrum after 5 days of age will only provide local gut protection, but remains a high energy source of nutrient for the calf.
- The IgG in the colostrum is related to the health and the vaccination program of the dam. The colostrum from herds vaccinated with Rotavirus is particularly valuable.
- Colostrum from individual cows varies significantly - depending on the age of the dam and the amount of colostrum produced at the first milking. Heifers' colostrum is equal to that of an adult cow in quality and IgG concentration. If in doubt pooling of first day colostrum gives added safety to the newborn.
- Jump-Start™ Full Cream Colostrum is a highly specialized colostrum powder that can supply some IgG if no fresh colostrum is available. Even if Jump-Start™ is given after the first 12 hours the high levels of IgG in this product will add some protection to the calf at the local gut level.
- A blood test to ascertain the IgG status of the calf is available. Ask your vet.

calf rearing **BEST PRACTICES**

Meal and roughage feeding

Meal (concentrates) is valuable to stimulate rumen function, and to prepare the rumen for an all grass diet. It allows for a smooth transition from milk to grass feeding. The rumen matures at about 3 weeks of age and meal hastens this development.

Fibre (hay and straw) also contribute to the development of the rumen but is lower in energy and should not exceed more than 10% of the diet. Hay (higher in energy, palatability and digestibility) is always better than straw. The often quoted benefit of fibre as a “scratch factor” to stimulate the rumenal papillae is a myth. Both act as a diet modifier and help to “stretch the rumen”. All fibre sources should be free of moulds and smell good.

The quality of the concentrate is very important, as the main factors that drive meal intakes are milk volumes fed and the palatability of the meal.

The characteristics of a good quality meal are:

- Highly palatable. Highly digestible. The inclusion of molasses helps to achieve this. Protein levels are best between 13 - 20%. A high protein level is needed whilst the calves are indoors. When given access to pasture this level can be reduced to save costs and not compromise growth rates.
- High in vitamins and minerals
- Contains rumenal buffers to prevent acidosis
- Always contain a Coccidiostat (Rumensin or Decco).

Calves can be weaned off milk when meal consumption is greater than 1kg/calf/day. Meal feeding should then be increased to 1.5-2.0kg/day for the next month.

Be aware of bird contamination in meal feeders, those with plastic flaps help to minimise this problem. Filling meal trough in the evening is also a useful way to prevent bird fouling.

Trough space: As meal consumption goes up it is important to ensure that every calf can have simultaneous access to the trough. Allow 300mm of head space/calf.

Water: As meal intakes increase water intakes become critical and will limit consumption. Clean ad-lib water must be available via an adequately sized trough.

calf rearing **BEST PRACTICES**

Control of Coccidiosis in Calves

Coccidiosis is a protozoan infection of the gut in young calves. The infection comes from faeces of in-contact calves or adult stock, and from around water troughs, swamps and drains contaminated with faeces. The symptoms of coccidian infections are scours with mucous and blood. Straining and the presence of blood around the anus is a common sight. The condition is rarely fatal but seriously affects the growth rate. The condition is seldom seen before 3 weeks of age, and only in calves exposed to pasture or mud. With calves restricted to a calf barn the infection is seldom seen until soon after access to pasture and after weaning off milk.

Traditionally CMRs have had a coccidiostat (a drug to control this disease - Deccox) added as an extra safety precaution especially for calves that may be reared in the paddock. Two of the CMRs in the Fonterra range (ancalf™ and SupaCalf™) contain deccox at therapeutic levels, but the others (Bounce™, Denkavit Plus, Denkavit Whey and Jump-Start™ Full Cream Colostrum™) do not. So check the bag label. Note that cow's milk does not contain a coccidiostat.

The best way to control Coccidiosis is by feeding meal/pellets containing a coccidiostat (Deccox, Rumensin) in conjunction with the CMR. This is the product that will be fed at the time when a real control against this infection is required. Most concentrates are medicated and will give a full cover with intakes of 1kg/calf/day. For full control it is recommended that meal feeding should be continued for at least 1 month after weaning off milk. Faecal tests for the diagnosis and monitoring for this infection is cheap and simple - consult your veterinarian.

Weaning Management

- Sample-weight calves to ensure target growth rates are being met before making weaning or management decisions.
- Weigh bands are a useful tool to gauge calf weights quickly, but are only approximate.
- Weaning off milk is not recommended below 65kg.
- Later weaning will contribute to a greater increase in growth rates.
- Ensure pasture is of high quality and of sufficient sward length.
- Calves should be growing at 0.8-1.0 kg per day and consuming 1-1.5kg meal per day when weaning on to pasture.
- Continue to feed meal for 3-4 weeks after weaning from milk.
- Follow a transition period when weaning onto pasture by feeding 1-2kgs of pellets per day until 10-12 weeks.
- Lower protein (16%) meal maybe fed once on pasture.
- Continue to monitor calves after weaning to ensure health is not compromised.
- Make sure shelter, water and hay/straw are all available after milk weaning. Hedges or shelter belts are ideal.

REHYDRATION of calves

Calves that are scouring are losing body water; body salts (electrolytes) and energy. Weight loss can be dramatic and fatal.

These ingredients must all be replaced as quickly as possible.

Irrespective of the cause of the diarrhoea (nutritional or infectious) the treatment is the same. That is to replace the lost fluids and salts and to maintain the energy of the calf. This is best done by giving a good quality oral electrolyte at therapeutic levels during the period of the diarrhoea and the recovery period.

However oral electrolytes by themselves are lower in energy than milk, so milk feeding during the scouring period should be continued as much as possible. Milk should never be withheld for longer than 24 hours.

Calf symptoms	% dehydration
Diarrhoea only	5%
Eyes slightly sunken, skin losing elasticity, calf staggery, but calf still suckling	7%
Eyes sunken, skin slow to flatten if pinched, gums sticky, calf depressed	9% *
Eyes very sunken, skin won't flatten out if pinched, calf cannot stand	12% *

* These calves will need additional intravenous fluids administered by a vet.
Note: Any calf that has scoured for one day is at least 5% dehydrated.

To rehydrate the calf use the following calculations

1. To determine the volume of fluid required to correct the dehydration multiply the weight of the calf by the % of dehydration (from table above).
eg: a 40kg calf x 7% dehydration = 2.8 litres electrolyte just to correct the fluid loss.

BUT ALSO

2. Requires a futher 10% of the body weight in fluids for maintenance that day.
eg: a 40kg calf requires a minimum of 4 litres of fluids/day
There for:
3. To fully rehydrate the calf add these two volumes (**Rehydration + Maintenance**) together to give the total required for that day.

In the example above = 6.8 litres or more!!

Give no more then 2 litres per feed. So the calf needs to be fed 3-4 times per day.

Do not mix electrolytes with milk. Feed separately, the interval between feeds to be not less than 2 hours.

REHYDRATION of calves

A recommended feeding regime for a scouring calf should look like this.

	AM	Noon	PM	All night long
Moderate Scours	Milk 1-2 litres	Electrolytes 2 litres	Milk 1-2 litres	Electrolytes Ad-lib 2-4 litres

Total: 6 - 8 litres

	AM	Noon	PM	All night long
Severe scours	Electrolytes 2 litres	Milk 1-2 litres	Electrolytes 2 litres	Electrolytes Ad-lib 4-6 litres

Total: 8-10 litres

- Reassess the next day and feed accordingly.
- Electrolytes can be offered via a teat feeder, a trough or bucket or tube feeder such as Bovivet tube feeder.
- Use only good quality electrolytes to ensure a balanced intake of the salts and energy.
- Hot feeding (30oC- 45oC) will increase the will to voluntarily suckle or drink. We recommend the addition of Jump-Start™ Full Cream Colostrum to the diet as milk feeding is resumed.

TROUBLE SHOOTING

guide for good calf rearing

General Information

The success of good rearing depends on many factors - not just the milk being fed. These are:

1. The selection of a healthy good quality calf
2. The colostrum intake of that calf
3. The careful transport of that calf to the calf barn
4. The housing, pen sizes, ventilation, drainage and bedding
5. Milk Product (CMR or milk) volume and frequency of feeding.
6. Supply a good quality meal, fibre and water
7. Good feeding utensils - teat feeders, clean and working well
8. The daily observation of health or disease
9. Effective prevention of disease and proper treatments of ailments at therapeutic levels
10. Good quality staff.

When you walk into a calf barn use all your senses to assess calf health.

- Watch calves moving, standing up and stretching
- The colour and consistency of the faeces
- Discharge from the mouth or nose-saliva, mucous, blood or pus

- LOOK**
- The willingness to drink and eat
 - Eyes bright and alert
 - Skin soft and shiny
 - Look at the navel and joints

- LISTEN**
- Grinding of the teeth
 - Bellowing
 - Coughing

- SMELL**
- Smell of the milk, meal, hay and water
 - Smell of the bedding and air
 - Smell of the faeces

- TASTE**
- Taste the milk, meal, fibre and water.
 - Taste of all the additional products offered to the calf
 - Any product offered to the calf should be palatable and free from fungi and moulds.

The most useful diagnostic tool in the calf barn is a clinical thermometer.

Use it to detect disease early, and to monitor the treatment regime.

The normal temperature of a calf will vary with the ambient temperature, but is in the range of 38°C-39°C. If in doubt take the temperature of a normal pen mate and compare the temperature. NB: Check temperature of normal pen mate before the sick calf.

TROUBLE SHOOTING

guide for good calf rearing

Some common clinical signs and the possible cause

Lame or reluctant to stand	Injury, joint ill (navel infection), Diarrhoea?
Swollen navel	Navel infections? Hernia? Pizzle sucking?
Sunken eyes	NB: See "Rehydration of Calves" on Page 13 of this booklet
Reluctant to drink-slow drinking	Any infectious disease, injuries to the mouth or tongue, poor quality milk, stored colostrum or milk powder? Teat / tubing quality
Scours - nutritional	White or yellow faeces bright and the temperature is normal
Scours - infectious	Faeces watery, mucousy, brown or yellow blood? Foul smelling Temperature is usually elevated above 39°C
Blood in the faeces	Often normal if seen in the first 3 days - calf is bright, temperature normal. A calf dull with a high temperature is indicative of Salmonella or Coccidiosis
Coughing or rapid respiration	Respiratory infection from poor ventilation or infectious agents
Shivering	Cold or wet conditions? Feeding cold milk? Draughty calf barn?
Kicking at the belly	Abdominal pain, colic, peritonitis, gut catastrophes - uclers, twisted bowel, Indigestion-overfeeding of milk, cold milk gorging on meal. Poor quality milk, fibre or meal
Bloat	Cold milk feeding - milk into rumen? Overdrinking or gorging on meal? Young fresh grass? Clostridia diseases?
Salivation	Indication of high fever-check temp? Mouth tongue or cheek lesions, injured jaw Ulcers and abscesses?

TROUBLE SHOOTING

guide for good calf rearing

Some common clinical signs and the possible cause continued...

Grinding of the teeth	Indicates abdominal pain? Scours? Lack of fibre? Boredom?
Pizzle sucking	Low volume feeding, unsatisfied sucking instinct, lack of water?
Hair Loss	Often after a bout of severe scours, Excessive cold and wet-standing in mud Lice? Fungal skin infections

Recommendation: If in doubt consult your veterinarian

common INFECTIOUS agents

Scours - The common pathogens and their significance

Diarrhoea in calves is either nutritional or infectious in origin.

The colour, consistency and smell of the faeces may give a clue as to the possible cause of the scours, but can not be relied upon to give an accurate diagnosis.

The best aid to confirm a diagnosis is by laboratory testing and the use of a clinical thermometer.

Calves with nutritional scours will not have a temperature.

Calves with infectious scours will often have a significant rise in temperature, especially at the start of the diarrhoea.

NB: Check temperature of normal pen mate before the sick calf.

Use as a guide only.

Listed are the common infectious causes of scours during the first 1-5 weeks of the rearing period. The causes are listed in an approximate order of appearance, but should not be used as a diagnosis.

The severity of the scours, the percentage of calves affected, or the mortality rates may vary enormously depending on the immunoglobulin status of the individual and the disease challenge. **Mixed infection is common and can further affect the scours and the outcome - so take care.**

Infectious agent

E Coli

Symptoms and treatments

Acute scours and deaths in the first 3 days of life in calves with a low IgG intake. temperatures >39.5oC. High mortality in individual calves. Also check water supply. Treatment: Antibiotics - usually too late. Correct the colostrum intakes.

Cryptosporidiosis

Usually in the first 10 days. Often seen in conjunction with Rotavirus. Signs - acute diarrhoea, very watery pale yellow in colour affecting up to 100% of the calves. temperatures usually between 39.0-39.8 oC. Mortality rates are low if given good treatments early. Duration of scours is usually less than 3 days.

common INFECTIOUS agents

Infectious agent	Symptoms and treatments
<p>Cryptosporidiosis *** continued...</p>	<p>Treatment: antibiotics are of little value. Maintain energy and fluid intakes with electrolytes and milk - see notes in rehydration. Note: See "Rehydration of Calves" on page 13 of this booklet.</p>
<p>Rotavirus ***</p>	<p>Acute watery yellowy faeces, foul smelling lots of mucous but usually no blood. Very contagious between calves and around the barn. Very hard to stop. Often affecting 100% of the calves spreading in waves from pen to pen. Duration of scours is about 3 days. Temperatures 39.0-40oC. Recovered calves grow well. Mortality rates are between 2-20%. The best prevention and control is to purchase calves from herds vaccinated against this disease.</p> <p>Treatment: Antibiotics are of no value. Mortality rates are variable depending on the care given. Maintain energy and fluid intakes electrolytes and milk - see notes on rehydration.</p>
<p>Campylobacter ***</p>	<p>Acute foul smelling watery scours within the first 3 weeks. Mostly associated with an infected water supply. Diarrhoea is of short duration. Correct the cause. Mortality rates are usually low.</p> <p>Treatment: Antibiotics are of little value. As for Rotovirus.</p>
<p>Corona Virus</p>	<p>Acute scours usually after week 2, but often in association with Crypto and Rotavirus. Is often considered to be a secondary opportunist virus, rarely causing disease by itself. Mortality rate is low and calves recover well.</p> <p>Treatment: As for Rotovirus.</p>

common INFECTIOUS agents

Infectious agent

Salmonella ****

Symptoms and treatments

Acute bacterial diarrhoea and most devastating disease in the calf barn. Very watery foul smelling. Characteristically with mucous and blood. Very rapidly fatal often even before scours are seen. Temperatures often > 40°C in the early stages.

Very rapid spread from calf to calf in adjacent pens. Often associated with the arrival of already infected calves or introduced by birds and rodents. Mortality rates are frequently 20% plus. Recovered calves have depressed growth rates for several weeks due to the damage done to the gut lining.

Treatment: The success of the treatment depends on recognising this disease early and with a very aggressive treatment protocol. Treat with an approved antibiotic, antipyretic drug and therapeutic levels of electrolytes and milk - consult your vet. Vaccination with a salmonella vaccine on arrival in the barn or in the face of an outbreak is often used to prevent or control the spread of the disease. Control birds as much as possible.

Coccidiosis

Diarrhoea is often sporadic in calves over 3 weeks of age and on pasture. Faeces green, with mucous and frank blood. Often seen straining with fresh blood on the tail and rectum. Temperatures are usually near normal. Usually not fatal but can severely check growth rates for several weeks.

Treatment: Best is by prevention of this condition with a meal containing coccidiostat. Vet treatment with an approved antibiotic or coccidiocidal drug may be necessary - consult your veterinarian.

common **INFECTIOUS** agents

Infectious agent	Symptoms and treatments
<p>Bovine virus</p>	<p>Acute scours. Signs include salivation and diarrhoea (BVD) the presence of shallow ulcers on the tongue and gums. Temperature often elevated to 40°C in the early stages. Usually only a small percentage affected at one time, but will spread in waves from pen to pen.</p> <p>Treatment: Antibiotics are helpful. For full control and prevention see your vet.</p>
<p>Yersinia</p>	<p>A bacteria infection in weaned calves. Green mucous scours +/- blood. Temperature elevated. Often seen under condition of environmental stress in the autumn.</p> <p>Treatment: Antibiotics and vaccinate in contact stock.</p>

SPECIAL NOTE:

The disease marked with an *** above are all contagious to the calf rearer, children and dogs. It is always good practice to keep children out of the calf pens, and use good personal hygiene especially when preparing food.

Any personal handling calves that become ill with diarrhoea, vomiting or intestinal upsets should consult their health professional immediately. This is especially important for young children.

ANCALF™

Calf Milk Replacer enriched with Ancalci (calcium) and Deccox

ancalf™ is a premium calf milk replacer which contains extra calcium (ancalci) for greater bone development. ancalf™ can be fed to calves from day 4. Colostrum should be fed for the first 4 days. ancalf™ is a combination of casein based milk powders blended to meet the nutritional requirements of young calves and is 100% New Zealand sourced.

ancalf™ contains a premix which provides calves with their mineral and vitamin requirements.

ancalf™ contains Deccox™, which aids in the prevention of Coccidiosis. Coccidiosis is a parasitic disease that causes reduced feed consumption and conversion in the sub-clinical form. Clinical signs include bloody scouring and weight loss.

ancalf™ is a good curding, highly digestible quality milk powder that is available from all rural retail outlets.

ancalf™ can be fed on a twice daily feeding programme or on a once a day system.



TYPICAL ANALYSIS

Protein	26%
Fat	20%
Lactose	43.5%
Moisture	3.5%
Minerals	7%

SUPACALF™

Premium Calf Milk Replacer with Supagest™ and Deccox



TYPICAL ANALYSIS

Protein	26%
Fat	20%
Lactose	43.5%
Moisture	3.5%
Minerals	7%

Supacalf™ is a premium calf milk replacer containing Supagest™, which maximises nutrient uptake and minimises nutritional scouring problems through its ability to absorb water. Supacalf™ can be fed to calves from day 4. Colostrum should be fed for the first 4 days.

Supacalf™ is a combination of casein based milk powders blended to meet the nutritional requirements of young calves and is 100% New Zealand sourced.

Supacalf™ contains a premix which provides the necessary balance of vitamins and minerals required in young calves.

Supacalf™ contains Deccox™, which aids in the prevention of Coccidiosis.

Supacalf™ is a good curding, highly digestible quality milk powder that is available from all rural retail outlets.

Supacalf™ can be fed on a twice daily feeding programme or on a once a day system.

BROWN BAG™

Calf Milk Replacer

Designed
for Dairy
Farmers

Brown Bag CMR™ is a new low cost CMR, formulated from non curding dairy ingredients such as infant formulas and is 100% New Zealand sourced.

Brown Bag CMR™ now contains Actigen® which is a natural carbohydrate fraction that supports an animal's natural defence, maintains intestinal function and aids full absorption of nutrients. Actigen® is traceable and is a valuable growth permitter helping animals achieve their full potential.

This CMR is designed to lower the overall cost of calf rearing, and can be fed to calves from day four. Our trials have proven an average of 700 gms per calf per day daily weight gain is possible using Brown Bag CMR™. These trials have been carried out on farms with better than average husbandry and management skill levels and results may vary under other conditions. Therefore we recommend two-stage feeding beginning with a premium CMR such as ancalf™ or SupaCalf™ and completing with the Brown Bag CMR™.

Note: Brown Bag CMR™ is a **non curding CMR** and rearers using two stage rearing systems should make the change from a curding CMR to Brown Bag CMR™ **suddenly**. (Do not mix together or prolong the change over). Some rearers find it useful to drop the overall volume at this stage to avoid overloading the digestive system.

For operations using Brown Bag CMR™ as the sole CMR we strongly recommend the mixing rate of 150 gms per litre on a twice per day feeding system.



TYPICAL ANALYSIS

Protein	21%
Fat	21%
Lactose	48.5%
Moisture	3.0%
Minerals	6.5%
ME (KJ/kg)	21.0%

DENKAVIT PLUS



TYPICAL ANALYSIS

Protein	26%
Fat	20%
Lactose	43.5%
Moisture	3.5%
Minerals	7%

Denkavit Plus is a premium “full cream” Calf Milk Replacer containing added Colostrum which has a high source of energy and is the important starting block for disease prevention.

Denkavit Plus is formulated from only the finest ingredients and has good curding characteristics. This “curding” or “clotting” forms in the Abomasum to provide digestion as nature intended.

Denkavit Plus is manufactured using all dairy ingredients such as whole milk and skim milk powders.

Denkavit Plus contains a premix which supplies calves with their vitamin and mineral requirements.

Proudly manufactured by Fonterra and marketed by NZAgbiz Ltd in Australia and New Zealand, to smart calf rearers in both countries, under licence to Denkavit Holland.

DENKAVIT WHEY

Denkavit Whey is the world's leading brand of Whey milk replacer.

Denkavit Whey is a precise and proven blend of high quality Whey proteins, Vegetable proteins (Soy and Wheat), and highly digestible Vegetable oils and Lactose.

Denkavit Whey CMR contains a prebiotic and acidifiers to enhance disease resistance and a high level of vitamins and minerals.

Denkavit Whey CMR does not contain coccidiocide.

Denkavit Whey contains no casein proteins and so does not curd. This non curding allows for a more rapid digestion and absorption of the nutrients without digestive upsets. This premium CMR is proven to be suitable to feed to calves from 4 days of age, or alternatively introduced after 14 days to reduce rearing costs. Suitable for all feeding systems.

Imported from Europe and proudly marketed in New Zealand by NZAgbiz Ltd.



TYPICAL ANALYSIS

Crude Protein	23%
Crude Fat	20%
Crude Fibre	0.3%
Lactose & other soluble carbohydrates	45.2%
Minerals (Ash)	8.7%
Salt	Max 2%
Moisture	2.5%

JUMP-START

Full Cream Colostrum - Natural Colostrum Supplement



Jump-Start™ Full Cream Colostrum is a full cream colostrum powder, and is designed as a natural supplement for newborn calves that have received little or no colostrum at birth. It is an antibody supplement that will provide a level of IgG to a newborn animal.

Jump-Start™ has added vitamins and minerals and is high in Vitamin A, Vitamin E and Niacin.

For maximum IgG uptake Jump-Start™ should be fed solely on day 1. For days 2 to 4 it is recommended that the animal receives 1 feed of Jump-Start™ and 1 feed of milk or a suitable milk replacer each day.

Feeding recommendations:
150g Jump-Start™ to 1 Litre of warm water.

Jump-Start™ is available from rural retailers nationwide. Each 600 grams sachet makes 4 litres of colostrum milk.

Colostrum is well recognised as being of benefit to ill or scouring calves.

Note: see 'rehydration of calves' on page 13 of this booklet.

TYPICAL ANALYSIS

Protein	42%
Fat	27%
Lactose	22%
Moisture	3%
Minerals	6%
IgG	7%



CALF REARING GUIDEBOOK

Marketed by:

NZAgbiz
LIMITED



Dairy for life

Fonterra Co-operative Group
PO Box 844,
Hamilton, New Zealand

For more information on
NZAgbiz Limited products
call Customer Services on
0800 809 011

SupaCalf, ancalf, Brown Bag and
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