

People and facilities

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Research

Key Points

1. Get the right person to rear the calves and ensure they have the resources and support to do the job well.
2. Calf sheds need to be draught free but well ventilated at a high level.
3. Maximise sunlight – it is a natural steriliser.
4. Bedding needs to be clean and dry.
5. Calves need access to fresh water at all times.

Would you swap places with your calves??



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Calf Rearing Fact Sheet 1.1

Staff

- Select and invest in the right person - rearing calves requires skill, attention to detail and empathy with the calves.
- The best rearer is someone who actually wants to do the job, not someone who is directed to do it. Keep trained staff in the calf shed.
- Ensure they have the time and support they need to do the job well.

Facilities

- The calf shed should be dry and draught free. There needs to be airflow at a high level but no draught at calf height – a match shouldn't blow out when lit at calf height.
- Calf sheds should face towards the sun. Sunlight dries out and helps sterilise the shed.
- Purpose built calf sheds can have a UV resistant plastic roof and shade cloth/fabric walls which can be rolled up for better ventilation.
- If building a new shed, consider drainage under the calf shed and design the shed so that milk/colostrum can be piped/gravity fed. Install swinging gates with self-closing latches and a raised collection pen/ramp for loading / unloading calves.
- Avoid sharp edges, nails, corrugated iron or any small gaps where calves can get their heads or hooves stuck.
- Calves need a minimum of 1.5 m²/calf. The smaller the available area per calf, the messier the shed and the more fresh bedding required.
- All calves (including bobbies) must have access to clean fresh drinking water at all times.

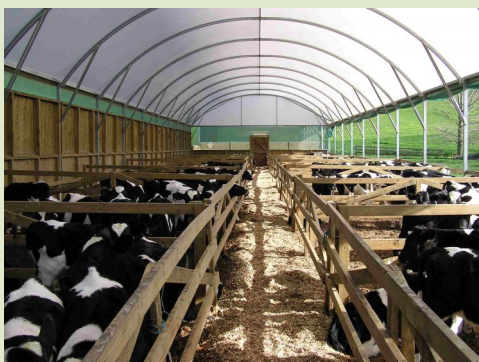
Bedding

- Some calf sheds successfully use grating—as long as there is no draught coming up through it.
- Ensure bedding is topped up regularly or replaced with fresh material – untreated shavings, sawdust or bark chips are ideal. Concrete might be easy to clean but it is cold and slippery.
- Regularly (at least weekly) spray surfaces at calf level – pen fittings, walls, gates, floors/bedding with a virucide disinfectant.
- Have a separate area designated for sick calves to minimise disease spread. Clean out the calf shed at the end of the calf rearing season rather than just before the start of the next season. This allows time for sunlight to sterilise the shed.

Building a calf shed

Key Points

1. Low cost calf sheds can be constructed using UV resistant plastic. This has the advantage of letting in sunlight which acts as a natural sterilant.
2. Site sheds so that shelter belts protect people, calves and shed from prevailing winds.
3. Face calf sheds into the sun for warmth and sterilisation.
4. Ventilation is important - not draughts at calf height but provide air movement at a high level.
5. Decide on your milk feeding system – this usually dictates the size, shape and layout of pens.



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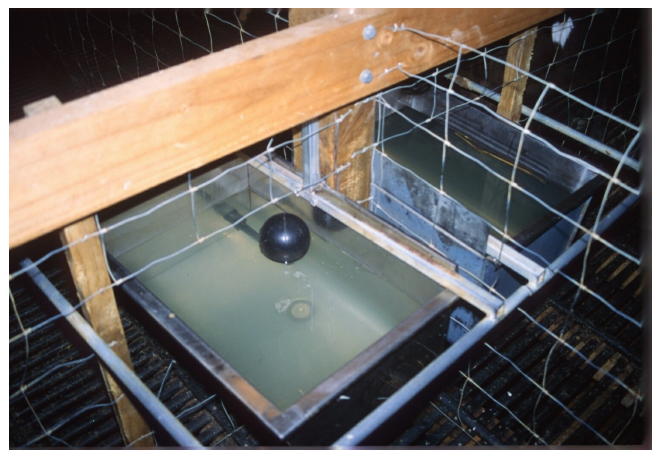
Calf Rearing Fact Sheet 1.2

General design

- A good calf shed is one that meets the needs of both calves and calf rearers.
- Calves can be reared in a wide range of facilities from converted implement sheds to purpose built calf sheds.
- Use existing shelter belts where possible. These make the environment warmer for people and calves, while protecting sheds from wind damage.
- Ventilation is important. There should be air movement above the calf to prevent the build up of ammonia and subsequent problems with pneumonia. Solid partitions between pens prevent draughts.
- Many sheds now have a UV resistant plastic roof and shade cloth on the walls which can be rolled up for ventilation. Such sheds can be built at much lower cost than traditional sheds because of the lighter materials used.
- Sheds (and calves) should face into the sun. Sunlight is not only good for keeping calves warm it also dries out and disinfects the pens.
- If building a new shed, consider drainage under the shed. Ideally, the shed should be higher at the back and have some form of drainage at the front.
- Consider covered areas for storing feed and mixing milk. Load-out facilities and a race with calf scales are very useful.
- Have a separate pen where sick calves can be placed in isolation.
- Avoid sharp edges, nails, corrugated iron or any small gaps where calves can get their heads or hooves stuck.

Pens, bedding and feeding

- An area of 1.5 m²/calf is a minimum and pens of 10-12 calves are ideal. In an open fronted shed, pens should be twice as deep as they are wide.
- Decide on your milk feeding system and design pens to suit. If hanging a feeder on the front of a pen there needs to be sufficient space for all calves to feed.
- The best systems involve having calves of a similar age together and having a separate quarantine area for new arrivals.
- The best bedding is whatever is readily available at a reasonable price. Bark chips, post peelings and sawdust are all useful. Bedding should be at least 200-300 mm deep. Fresh bedding needs to be added as calves get older and pens get messier.
- Slatted floors and under pen drainage are good provided there are no draughts.
- Modern sheds feeding whole milk should be designed so that milk is piped (gravity fed) to avoid carting milk.
- All calves (including bobbies) must have access to clean drinking water.
- A perimeter guard around each trough (see next page) can prevent fouling.



Nutritional scours

Key Points

1. Nutritional scours are related to stress, over feeding or a change in feed.
2. Early detection and treatment are important to minimize negative impact.
3. Problems are dehydration and acid imbalance
4. Take off milk for 24 hours and feed large volumes of electrolytes.
5. If calves are alert, leave electrolytes in a feeder in the pen between feeds.
6. If calves are unable to drink administer electrolytes with a tube feeder (below).



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Calf Rearing Fact Sheet 2.3

Introduction

- Calf scours (diarrhoea) is the single most important cause of death in milk-fed calves. Scours can be classified into two types: nutritional and infectious. Nutritional scours is usually caused by stress to the calf due to a change in management routines. Nutritional scours can progress to an infectious scour. Depending on the severity of the scours, rearers will see some or all of the following:
 - bright yellow or white faeces
 - depressed calves which are reluctant to feed or suck
 - lack of energy and lethargy
 - dry muzzle
 - wet under the tail
 - calves with sunken eyes and/or a temperature
 - dehydration

Nutritional and stress scours

- The initial digestion of milk occurs in the abomasum (or fourth stomach) and then in the intestines.
- Nutritional scours is due to an inadequate milk digestion in the abomasum due to overfeeding, stress, too rapid change in diet or the milk not curdling. This means the milk leaves the abomasum too early and overloads the intestine with lactose. This results in a watery scour and the fluid loss results in a very dehydrated calf.
- Environmental stress can also cause scours - e.g. over-crowding, a sudden change in the weather or cold, damp, draughty or humid conditions inside calf sheds.
- Even changes in staff and hygiene can increase the likelihood of scours. The stress of transporting calves from the sale yards or from one farm to another may be sufficient to lead to scours if calves are offered milk on arrival. Newly arrived calves should be fed an electrolyte solution.

Symptoms

- Scouring calves can lose up to 5 litres of fluid each day including minerals salts essential for normal body function. With most scours, it is the dehydration and acidosis, that kills the calf. With nutritional scours, a calf may still look healthy and have a good appetite so early detection is critical.

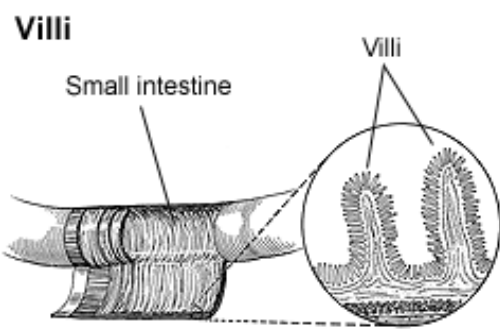
Treatment

- Stop feeding milk to calves with nutritional or stress scours for 24 hours.
- Feed electrolytes instead of milk. The more dehydrated a calf is the more electrolytes it needs. For example if a 40 kg calf has lost 10% of its body weight it will need 4 litres of electrolytes to replace it. A dehydrated calf may need 6-10 litres.
- Feed at least three times a day. If a calf will not drink, feed electrolytes using a tube feeder.

Rotavirus

Key Points

1. Rotavirus is spread via faeces and can even be airborne. Infected calves scour out huge numbers of virus particles and the level of contamination may increase very rapidly.
2. It cannot be controlled by antibiotics.
3. Control strategies involve vaccinating cows, ensuring calves get colostrum and maintaining good spraying regimes and hygiene within the shed.
4. Critical to identify and start treatment early. Signs include a pale yellow scour and reluctance to feed.
5. Isolate sick calves if possible. Feed milk and electrolytes with at least two hours between a milk feed and feeding electrolytes. If necessary tube feed electrolytes.
6. Disinfect pens regularly.



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Calf Rearing Fact Sheet 2.4

General

- Rotavirus is the biggest animal health issue facing calf rearers with some experiencing death rates as high as 30%. It can be devastating and demoralising.
- Rotavirus is persistent in the environment, and can remain infectious for many months at room temperature. It can withstand low temperatures and high humidity on non-porous surfaces like plastic and concrete.

What is it and how does it kill calves?

- Rotavirus infects and destroys mature cells from the tip of the 'villi', which are the tiny, finger like projections on the surface of the small intestine that help absorb nutrients.
- Absorption of milk and electrolytes is reduced and the damage to the intestinal cells means that fluid is lost from the intestine, further compounding the dehydration. It is this dehydration that generally kills the calf.
- Scouring continues until the villi inside the small intestine are again covered with mature cells that allow normal digestive-absorptive processes to resume.
- Rotavirus also increases the concentration of calcium in the intestinal cells which acts like a toxin and leads to the characteristic pale yellow scour of Rotavirus.

How is it spread and what are the signs?

- Rotavirus usually affects calves less than 3 weeks old and is primarily spread by infected calves shedding large quantities of the virus. Other calves ingest faecal matter or inhale virus particles. Incubation time depends on the level of environmental challenge the calf is exposed to but is typically between 24 - 48 hours.
- The most obvious sign of Rotavirus in calves is a pale yellow scour, often rancid smelling. This scouring leads to fluid loss, electrolyte loss and dehydration.
- Initially Rotavirus will need to be confirmed with a lab diagnosis but experienced rearers generally make a diagnosis very quickly. The key to managing an outbreak is early identification of infected calves so that they can be isolated and treated promptly with electrolytes.
- During each feed it is important to cast an eye over each calf to identify any potential signs of illness. These may include-
 - Hanging back from the feeder/reluctance to come in and feed
 - Reluctant to drink, fussing with teat, coming off teat
 - Drinking slower than normal
 - Wet tail
 - Pale yellow scour – can sometimes be watery and/or bloody.

- Most calves that die, do so from loss of water and electrolytes, rather than from direct action of rotavirus itself. This means rapid treatment with electrolytes is critical.
- Animals may continue to shed the virus in their faeces even if they are not showing clinical signs.
- Calves do not become “immune to rotavirus” so they can get re-infected. However, because calves are older, the second infection is usually less severe.

Treatment

- Treatment with large volumes of electrolytes is labour intensive and time consuming- and not always effective particularly with younger calves. Even if the animals do recover, they will still shed large numbers of virus particles into the environment, potentially infecting healthy calves. Recovered calves may have slower growth rates and be more susceptible to other diseases.
- Feed large volumes of electrolytes but don't stop feeding milk as it is important to keep the calf's energy levels up. Many electrolytes contain sodium bicarbonate that alter the pH in the digestive tract and adversely affect milk absorption, so milk and electrolytes should be fed at least two hours apart.
- As a general rule, calves in the sick pen need as much electrolytes as you have time to get into them.
- While only small numbers of calves are infected isolate the calves being careful to disinfect any equipment used with sick calves. Don't go straight from the pens with sick calves to pens with healthy calves – clean boots and overalls.
- Spray pens with a virucide if sick calves have been removed. This should help protect the remaining calves in that pen.

How do we prevent Rotavirus?

- Unfortunately there is no silver bullet although vaccinating cows against rotavirus and then feeding calves with colostrum and milk from these cows certainly helps. The risk period for the incidence of Rotavirus infection generally occurs between 5 and 14 days of age when the passive immunity from the dam is wearing off and the calves own immune system has not fully developed. Antibodies in colostrum can continue to provide limited local immunity in the gut (even though they can't be absorbed through the calf's gut) so feeding of colostrum from vaccinated cows will help prevent the development of rotavirus.
- The timing of rotavirus on dairy farms often coincides with stored colostrum running out.
- Ensure the shed is thoroughly cleaned out at the end of each season and sprayed with a virucide solution. To reduce the virus contamination to a minimum, spray the shed every 3-4 days with a virucide solution throughout the risk period (i.e. until the youngest calves are at least two weeks of age).
- Many solutions are suitable for spraying over calves. Maintain a high standard of cleanliness in the shed and thoroughly clean and disinfect equipment such as feeders, especially equipment used in the sick pen.
- Avoid visitors to the calf shed. If calves are coming from a number of sources, pen calves from the same farms together and group calves according to age.

Our experiences

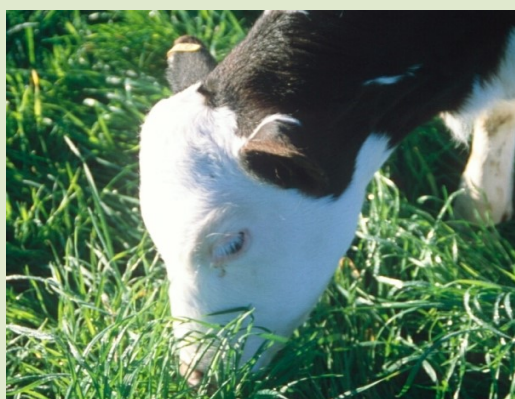
- One year we experienced a rotavirus outbreak on the 13th August. There were 435 calves in the shed ranging in age from new arrivals to calves which had been in the shed for 21 days. Within 3 days of the first case of rotavirus being diagnosed it had spread through the shed, with calves in all pens affected. Younger calves were hit the hardest but even the oldest calves were affected. However, older calves recovered and we had no deaths in the calves aged two weeks or older.
- In total, 46% of the calves were affected and at the peak we were treating over 80 calves.
- The shed was so contaminated that it became impossible to isolate calves so we stopped trying and concentrated on dealing with the problem. Most calves were on once a day milk feeding and we continued to feed milk in the mornings. At the morning feed, any suspect calf received a coloured neck band which meant it needed close monitoring. Any calf that had a wet tail got a different coloured neck band and was fed electrolytes in the evening from a bottle. In some cases, most calves in a pen had coloured bands and it was just as easy to feed electrolyte to all the calves in those pens. Any calf that was wobbly or couldn't feed received a different neck band and was taken to the sick pen. In total, 8% of calves were relocated to the sick pen and overall shed mortality was 5.4%. Calves in the sick pen were fed milk in the mornings and electrolytes at midday and in the evening (either by tube or bottle).
- Within 10 days we had worked our way through the worst of the outbreak but any new calves which were brought into the shed still went down within 48 hours in spite of regular spraying of the shed. We felt that we had a level of contamination within the shed which was even swamping good healthy calves.
- The only solution was to put new arrivals into a completely different shed.
- It is worth noting that in the same year we had 3 outbreaks of Salmonella. This was quickly recognised as being a different disease. Affected calves were treated with antibiotics and there were no Salmonella related deaths.

Guide to calf health

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Key Points

1. Calves need warmth, high quality feed and fresh clean water at all times.
2. Monitor calves regularly.
3. Plenty of colostrum fed early is critical. At least 2 litres in first 12 hours and 4 litres total within first 24 hours. After that, you have missed the boat!
4. Scours are a calf rearer's nightmare. Take action quickly to ensure calves remain hydrated.
5. Take concerns to your veterinarian early. Saving money on vet bills may negatively impact both bottom line returns AND calf welfare.
6. Some practices (tube feeding, dehorning and castration) require special skills. Learn from other professionals.



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Calf Rearing Fact Sheet 1.5

Introduction

- Calf rearing requires a high degree of skill and stockmanship.
- Calves are new born animals - they are weak and vulnerable. Their digestive and immune systems are only partially developed.
- Calves need to be checked regularly so twice a day feeding (and twice a day checking) is a good idea for young calves. A calf that won't feed or is slow to come up to be fed has a problem.
- A good recording system helps detect problems early. Coloured neck bands are a good way of identifying calves with problems. For example, a calf that is a slow feeder can get a coloured band and be checked at the next feed. Have different coloured bands for different issues.
- Calves that are small, have had birthing difficulties or haven't had adequate colostrum are highly susceptible to illness.
- Calves need at least 4 litres of colostrum in the first 24 hours. The first 12 hours are the most critical for ensuring maximum benefit from colostrum.
- The shed needs to be warm and dry with good ventilation and without draughts at calf level.
- A good layer of bedding is important to keep calves warm and absorb urine.

Scouring

- Scouring is the calf rearer's biggest nightmare. There are a number of causes and identification is often difficult. Young calves which are scouring need to be fed electrolytes immediately to avoid dehydration. The number and timing of calves scouring is often a clue as to the cause.
- Scouring in older calves is usually easier to deal with than scouring in young calves - the challenge is identifying the cause and deciding on treatment.

Navel infections

- These are caused by bacteria entering the umbilical cord. Navel becomes swollen, hot and the calf reacts when it is touched.
- Prevention is best - all calves should be treated with iodine at pick up. Infected navels need to be treated with penicillin.

Dehorning and castration

- Animal welfare is important and some practices are illegal. Local anaesthetic must be used when dehorning. Learn appropriate techniques and timing.

Welfare and euthanasia

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Key Points

1. Good calf welfare is non-negotiable for all calf rearers.
2. The Dairy Cattle Code of Welfare (2010) sets minimum standards around calf welfare. Ensure all those involved in calf rearing are familiar with this code.
3. It may be necessary to humanely destroy calves - follow correct procedures. Ensure there are good practices around dead calf disposal.
4. Approved methods of Euthanasia are rifle, captive bolt and chemical euthanasia.



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Calf Rearing Fact Sheet 1.6

Calf welfare

Good calf welfare underpins all successful calf rearing enterprises.

Investing in excellent welfare will pay dividends with low calf deaths, good growth rates and calves which grow into cows that are easy to handle. The Dairy Cattle Code of Welfare (2010) is very specific regarding the minimum care of calves. Some key points are:

- All calves must be fed colostrum within 24 hours of birth.
- All calves require a warm, sheltered environment with access to good quality water at all times
- Handle all calves gently and with care.

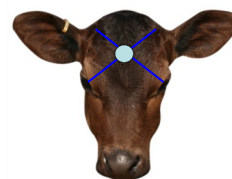
Euthanasia

- There will be times when it is necessary to humanely destroy calves. It is unacceptable to leave a calf suffering. On some farms it is policy to euthanase unwanted calves. It is important that there is a person on farm trained and capable of humane slaughter of calves.
- Approved methods of euthanasia are:

Approved method
Rifle



Approved method
Frontal Target



Blunt force trauma cannot be used to kill calves

Approved method
Rifle

To minimize the risk of the bullet exiting the body. Aim the rifle inline with the neck.



Approved method
Captive Bolt



Follow up to ensure death

- Bleeding out : Note - throat cutting is not an approved killing procedure. It is done after shooting with a rifle or captive bolt.
- When eyes are touched, dead animals have no blink reflex and no rhythmic breathing.
- It is important to confirm death after slaughter and re-check and confirm death again 5 minutes later.



- Note: a heartbeat may be felt 2-3 minutes after brain death.
- Dead calf disposal - have a plan. Most calves are disposed of in an offal hole/pit or in some regions a collection service operates. Dead calves may be worth selling to a 'slinky' buyer. Know what is available in your region.

Bobby calf welfare

There are some good 'Best Practice Guidelines' available refer <http://www.dairynz.co.nz/file/fileid/27767>

Painful procedures

- Disbudding and de-horning and castration must be done in ways that minimise pain and distress.
- Disbudding must be done by a veterinarian or appropriately trained personnel using a gas or electric cauterising iron with appropriate pain control (sedation/anaesthetic).
- It is best carried out as young as possible once the buds can be felt, usually at about 3 weeks.
- Consult your local vet and plan well ahead.
- Castration is best carried out as early as possible before 6 weeks (preferable 7-21 days) using a standard rubber ring. Use elastrators to apply the rubber ring to the neck of the scrotum. Ensure **both** testicles are in the scrotum below the rubber ring.



Feeding guide

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Key Points

1. Planning before the rearing season starts makes things easier.
2. Attention to detail is important.
3. Decide how and what you are going to feed your calves.
4. Create a routine and stick to it.
5. Ensure all calves have adequate colostrum in the first 24 hours.
6. Have a plan in place for when things go wrong.



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Calf Rearing Fact Sheet 1.7

General

- As calves are baby animals they initially need to be fed milk until their rumen develops sufficiently for them to obtain adequate energy from grass to maintain good growth rates. How fast the rumen develops depends on the feeding system used.
- You need to choose a system that suits you and follow it carefully (see Fact Sheets 3.1 - 3.5).
- You need to know how much milk each calf is getting as both underfeeding and overfeeding calves can affect calf health and growth rates.
- Underfeeding a calf can reduce their future performance in terms of growth rate and lactation. Overfeeding is expensive, can cause scours and actually delays rumen development.
- Set up a routine so the calves are fed at the same time each day.
- Have a plan for what to do if something goes wrong.

Planning

- Before calf rearing starts, decide what equipment you are going to use, how much milk you are going to feed and how you will provide it.
- Make sure you have everything ready before the first calves arrive in the shed.
- On entry to the shed the calves should be fed colostrum as this is critical to producing healthy calves.
- Calves need to be trained to drink off a calf feeder. This can take time and patience and some calves take longer than others.
- Initially calves should be fed twice a day. The length of time calves are fed twice a day depends on the feeding system used and the size and health of the calf. Twice a day feeding enables you to check each calf twice a day.
- Make sure all calves come up and drink their milk ration at every feed.
- Make sure every calf has room to get on the feeder.
- Feed at the same time each day.
- Monitor what is happening – is every calf drinking well, are they alert, full of energy etc? Identify any calves that are not – and act to sort out their problems.
- Calves are fussy eaters especially when they are young so it is important to ensure that everything you feed—milk, calf pellets / meal, hay and grass is fresh, clean and appealing. Milk and pellets must be high quality.
- It is important that the milk feeders are kept clean and teats are replaced as they become worn.
- Calves need water as well as milk—particularly if they are eating meal.
- Keep water troughs clean as calves won't drink dirty water. If you wouldn't drink it, don't expect them to!

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Funded by



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