

BETTERRETURNS



Better Returns from calf rearing



A photograph of two calves standing in a bed of straw. On the left is a brown calf with a white blaze on its face. On the right is a white calf with black spots. Both are looking towards the camera.

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Introduction

Successful beef production starts with a bright and healthy calf that has been well looked after from the moment it is born.

It will have received two feeds of high quality colostrum within twelve hours of birth and then given milk replacer at least twice a day to achieve growth rates of 0.8kg/day from birth to weaning. Nutrition during the rearing period is related to lifetime performance and health of the calf. Thorough cleaning of all equipment between feeds is also of paramount importance in terms of controlling disease.

Providing good starter feeds from the very beginning is critical for rumen development. Weaning should take place once intake of starter feeds is adequate to maintain growth rates without milk.

Keeping calves in a well-ventilated, light and airy building is essential to prevent life-threatening diseases such as pneumonia, scours and mycoplasma, but minimising cold stress is equally as important.

Monitoring calf performance, in terms of growth and health, is important throughout the time spent on the calf-rearing unit. Picking up problems early will reduce medicine use and minimise impact on performance.

Following the advice in this manual will help ensure calves enter the next stage of their lives in the best possible condition and continue to grow to their expected targets.



Sarah Pick
Knowledge Exchange Manager
- National Assistant

Sourcing calves

Successful calf rearing begins with sourcing the correct calves for the system.

It is important calves have the best start in life as disease in the early stages can have long-term impacts on performance.



Buy calves that are:

- Known to have received adequate colostrum at birth
- Of known disease status
- Seven days old or more
- Well-grown for their age (at least 50kg at two weeks old)
- Healthy with a dry navel
- Alert and bright-eyed
- Showing acceptable conformation

Colostrum intake

Newborn calves are born without antibodies that are essential to prevent disease. Colostrum is the sole source of these antibodies, so it is important that all calves receive sufficient, good quality colostrum.

Quantity

Calves need a first feed of three litres within two hours of birth, followed by another similar sized feed within six to 12 hours of birth.

Colostrum should be fed at body temperature, which is 38°C. For further information watch the ‘3Q’s of colostrum management’ on the AHDB Dairy YouTube channel.

Quality

High quality colostrum contains at least 50g/litre of antibody IgG. To measure the quality, use a colostrometer or refractometer as it is impossible to tell by eye. For more information watch the ‘testing colostrum’ video on the AHDB Dairy YouTube channel.

Quickly

Aim for all calves to receive colostrum within two hours of birth to optimise immunity. This is because absorption of the colostrum declines rapidly from more than 40% at birth, to less than 5% by 20 hours after birth.

Top Tip

Blood testing calves can indicate whether they have received adequate colostrum.

Ask the vet to take blood samples within one week of birth. Samples can be tested for either the actual antibody level (IgG) or the total protein (TP) in the blood.

Quality	IgG g/L	TP g/L
Good	>12	>55
Marginal	10-12	50-55
Poor	<10	<50

Checks on arrival

Transport from the farm of origin to a rearing unit can be a severe cause of stress to young calves, which can increase the risk of disease. It is important to take steps to minimise stress where possible.

Calves frequently become dehydrated during transport and will benefit from being offered two litres of warm electrolytes on arrival.

This can be offered as an alternative to milk through a teat or computerised feeder. If the animal appears very dehydrated it can be given via a stomach tube. Milk can then be introduced the next day.

At this point dosing the calf with multi-vitamins should be considered.

Where other cattle are on the farm new arrivals should be quarantined for seven days and they should be observed for signs of disease such as scours.

Do not disbud or castrate immediately, as this will add further stress.

If their Bovine Viral Diarrhoea (BVD) status is unknown, calves should be tested for BVD antigen to identify any persistently infected (PI) animals.

Persistently infected cattle have a high likelihood of dying in their first year. Their weights are lower than healthy counterparts. The incidence of pneumonia can increase by 43% in healthy cattle sharing airspace with a PI.



Tag and test is one way to identify PI animals

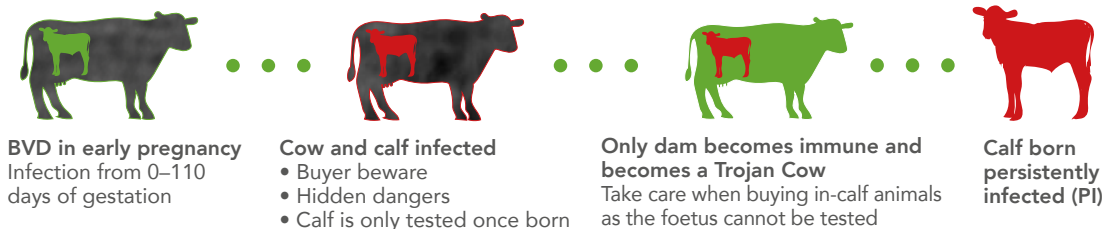
Calves identified as being PI should be culled immediately because they will shed high quantities of BVD virus into their environment for life.

Further information about BVD and BVDFree England, an industry-led scheme aiming to eliminate BVD virus from all cattle herds in the country by 2022, can be found at bvdfree.org.uk

Transport regulations

- Calves less than seven days old, or without a completely-healed navel, should not be transported
- Animals that are lame or unable to stand should not be transported
- Calves aged seven to 10 days old should only be transported a maximum distance of 100km
- Calves aged 10 to 14 days old should not be exposed to journey times greater than eight hours

How a PI calf is created



Milk feeding

Milk replacer

Milk replacers are the mainstay of most calf-rearing enterprises, but there are many different products and feeding systems. It is important to choose a milk replacer that will deliver the target growth rates. Maintaining consistency of product and a high level of hygiene when feeding is critical.



It is a legal requirement to feed calves under 28 days of age at least two liquid feeds a day.

Calves should grow at least 0.8kg/day from between birth to weaning and should be at least 80kg at weaning.

There are two main types of calf milk replacer – skim and whey-based powders.

Skim milk-based powders typically consist of around 80% casein and 20% whey. The casein forms a clot in the abomasum and is digested like whole milk.

Whey-based powders are digested in the small intestine and do not form a clot in the abomasum because there is no casein.

Both can provide good quality milk, depending on the ingredients and nutrients they contain. Milk replacer should contain 20–26% crude protein and 18–20% fat to achieve optimal growth rate in early life.

The exact amount to feed depends on calf liveweight, target growth rate, environmental conditions and the nutritional composition of the product being fed.

It is generally recognised that feeding rates for young calves have historically been too low. Current advice for most beef situations is to feed a minimum of 750g/day which can be achieved by feeding different concentrations as shown in Table 1 below.

Increasing the feeding rate increases growth rates, although the amount of calf starter feed being eaten at the same time must also be considered.

Table 1. Daily quantity of milk replacer supplied per calf (g)

Mixing rate (g/l)	Litres fed/day				
	4	5	6	7	8
150	600	750	900	1,050	1,200
140	560	700	840	980	1,120
130	520	650	780	910	1,040
125	500	625	750	875	1,000

Impact of the environment

In unfavourable conditions such as during winter, the concentration of milk powder or quantity of whole milk fed should be increased to compensate for the energy being used by the calf simply to keep warm.

Calves less than three weeks old need extra feed and warmth to maintain performance if the temperature falls below 15°C.

Calves older than three weeks need extra feed if the temperature falls below 10°C.

Always consult the manufacturer before mixing at concentrations other than those recommended on the instructions.

Mixing at high concentrations is more likely to result in a nutritional scour and reduced absorption of nutrients. Additional powder requirements are best provided by feeding more litres of milk per day, preferably in an extra feed. Any changes to feeding should be made gradually and it is better to apply a higher feeding rate across a whole rearing period than change feeding levels part-way though.



Table 2. Additional milk replacer or whole milk given when lower critical temperature drops

Environmental temperature at calf level (°C)	g/day of additional milk powder		l/day of additional whole milk	
	Birth to three weeks	Three weeks to weaning	Birth to three weeks	>Three weeks
15+	0	0	0	0
10 to 15	50	0	0.33	0
5 to 10	100	50	0.67	0.33
0 to 5	150	100	1.0	0.67
-5 to -0	200	150	1.33	1.01
-10 to -5	250	200	1.67	1.33

Milk feeding

MIXING MILK

- 1 Add half the water at 45°C to the clean bucket
- 2 Weigh the powder
- 3 Add powder to the bucket and mix thoroughly until smooth
- 4 Add remaining water and mix thoroughly
- 5 Check temperature is 37–39°C and feed

FEED FOR GROWTH

“ Milk powder should be made up with warm (45°C) water and fed at between 37–39°C. ”

Information from Volac feed for growth programme.

It is important to follow the manufacturer's instructions and ensure that everyone prepares the feed in the same way.

Calves should be fed at the same time each day, at the same temperature and at the same concentration. The same product should be used consistently to avoid digestive upsets and negative impacts on performance.

Milk powder should be made up with warm water at 45°C and fed at 37–39°C.

Cleanliness is paramount. Equipment should be cleaned between feeds, using detergent for feeders or buckets.



Whole Milk

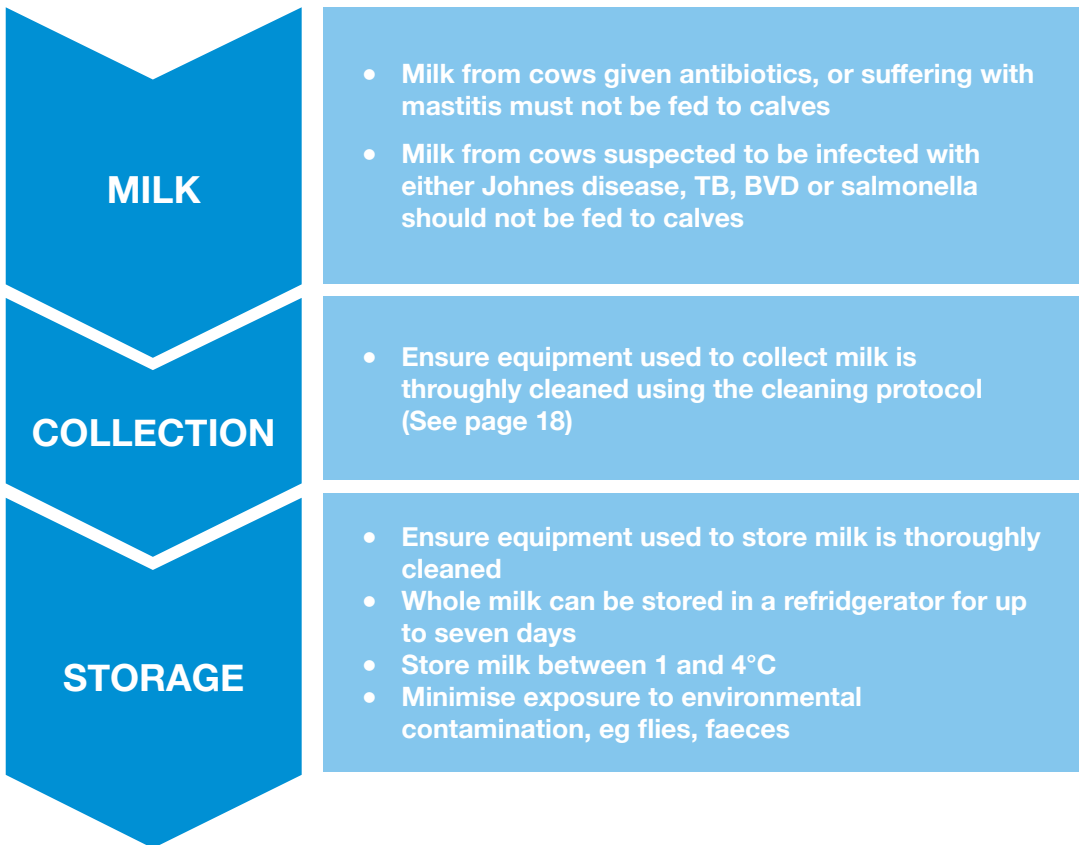
Feeding surplus or whole milk is an option for many dairy farms and if managed well, can produce good results.

Whole milk is typically 32% fat, 26% protein and 36% lactose in the dry matter (DM). This is much richer in nutrients than traditional milk replacers. However, hygiene is paramount to success with this system.

Feeding raw whole milk is a major route of transmission for Johne's disease and it can also contain the pathogens responsible for tuberculosis (TB), BVD or salmonella.

When feeding whole milk to calves, it is important the herd's health status is fully understood, particularly with regard to these diseases.

Milk can become contaminated at the following stages:



Rumen development



The newborn calf is a single-stomached (monogastric) animal, which only uses its abomasum for digestion in the first few weeks of life.

This allows it to make use of highly digestible feeds such as milk.

Development of a healthy rumen is a key step in the transition of the calf from a pre-ruminant to a ruminant and is driven by a number of factors related to the nutritional management of the calf in its early life.



There are four stages of rumen development:

- Birth to week three – the abomasum is the primary site of digestion with milk/milk replacers bypassing the reticulo-rumen via the oesophageal groove
- Weeks four to eight – as the calf starts to eat dry feed and, in particular, sources of starch, rumen development progresses
- Beyond week eight – post weaning. Fermentation of feeds by the microbial population in the rumen provides nutrients for the calf
- Month four: the rumen is now fully functional

Digestion of feeds rich in starch play an important role in rumen development. Calves should be managed to encourage intake of starter feeds as soon as possible.



Figure C clearly shows the darker coloration and the more developed rumen papillae of calves fed a grain-based starter feed.

Rumen development of calves aged six weeks

- A) Milk only diet
- B) Milk and hay
- C) Milk and grain-based starter feed

Source: Pennsylvania State University

Introducing starter feeds and forages

Calf starter feeds

These feeds are designed to promote rumen development, transitioning the calf from a milk-based diet to one based solely on forages and concentrates.

Providing a quality calf starter feed from the moment the calves arrive in the rearing unit is essential to stimulate rumen development, resulting in good growth rates and successful weaning.

A good calf feed should contain 18% crude protein fresh weight and a minimum of 12MJ of energy (ME) in each kg of DM. To achieve maximum intake it should be fresh, free from dust and mould and offered in clean troughs.

Fresh straw should also be offered in racks, on arrival. It is important to limit intake of good quality hay or other forages before weaning, as this can reduce starter intake and lead to calves becoming pot-bellied.

Calves should always have access to fresh, clean water, even when on milk.

Drinking water increases starter intake and rumen development.

Calves perform best with fresh drinking water available to them from birth.



Introducing starter feeds and forages

Weaning management

Good management at weaning is key to maintaining fast growth rates and minimising disease.

Weaning is the stage of calf rearing when the rumen has achieved adequate development to support the calf's nutritional requirements.

When to wean will depend on the individual system, with most producers weaning at around eight weeks old.

The exact timing of weaning should not be decided based solely on age, it is important that the calf is ready to be weaned.

A group of calves can be considered ready to wean when they are routinely consuming 1.5kg/head/day of high-quality starter feed. Do not wean animals when they are stressed or if they are showing signs of disease such as scours or pneumonia.

There are two basic approaches to weaning – abrupt and gradual.

Abrupt weaning when milk feeding is stopped suddenly, involves less management, but there is increased risk of growth checks.

Gradual weaning involves the slow reduction of the daily milk allowance over a period of seven to 14 days. This involves a higher level of management input but reduces the chance of growth checks.

A calf's consumption of dry food will be influenced by its availability, quality and palatability.

If calves are to be mixed, they should be grouped either 10 days before or 10 days after weaning to minimise stress.

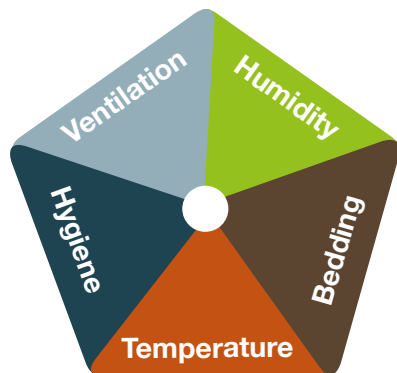
Work done at Harper Adams University showed gradually weaned calves had a greater daily liveweight gain (DLWG) post weaning of 0.2kg/day, had an improved coat bloom score and had reduced feed costs per kg gain of 16p compared to abruptly weaned calves.



Environment and housing

Good housing design supports good health and welfare, which will benefit the farm business financially. There are a number of different housing systems available for calves.

Five crucial factors affect the environment around the calf:



Ventilation

A constant supply of fresh air is essential in calf housing to prevent respiratory and other diseases.

Good ventilation removes stale, humid air. Stagnant air contaminated with dust, moisture, ammonia and viruses, which can cause pneumonia, must be removed and replaced by fresh air.

Cobwebs in buildings and condensation on the underside of roofing are signs of poor ventilation.



While fresh air is essential, draughts at calf level should be avoided.

The use of large volume or general-purpose buildings for calves is not recommended. The main reason is that young calves will not generate enough heat energy to drive the stack effect, which drives hot air up to the roof, where it cools and falls down the sides of the building.

Big buildings will only provide ambient temperature and youngstock risk suffering from cold stress.

There are situations where mechanical ventilation is valuable. Often the layout and development of farm buildings leaves areas that cannot be naturally ventilated. These areas can be significantly improved by either blowing air into the space (positive pressure ventilation) or sucking air out (negative pressure ventilation). In either case, it is still essential to provide adequate inlet and outlet areas and ensure no draught is created at calf level.



Environment and housing

Calf hutches are a good way to house calves individually or in small groups. They should be situated on free-draining concrete or on a porous base, such as chalk, ensuring that any effluent goes to a suitable site for disposal.

Ideally hutches should be moved after each batch of calves to minimise disease risk.

They must be properly cleaned and disinfected between calves. Turning the hutch over after it has been cleaned and disinfected exposes it to sunlight, which helps provide further disinfection.

The temperature inside the hutch can become raised during sunny days, so it is important to position them out of direct sunlight in summer.



Temperature

Extremely cold temperatures will result in reduced growth rates, as calves will use extra energy to keep warm. It is important to watch out for calves shivering or with raised hair.

A calf's ability to deal with cold improves with age. A newborn calf needs to be kept in a temperature of no less than 10–15°C. By one month of age, a calf can comfortably withstand temperatures around 6–10°C.

Temperature in the calf shed, at calf level, should be monitored daily.

Calf jackets can be used to help keep calves less than three weeks old warm, dry and healthy when temperatures fall below 15°C.

However, they do not take the place of good environmental management. The calves must receive sufficient energy from their diet and also have plenty of fresh dry bedding to nest in.

For further information read the guide to calf jackets in the AHDB Dairy resource library at dairy.ahdb.org.uk

Getting too hot

Roof lights can increase the heat within a building when fitted facing south. To avoid overheating it is recommended that roof lights are fitted facing north.

Further information on cattle housing read 'BRP+ Better cattle housing design' online at beefandlamb.ahdb.org.uk

Humidity

High levels of humidity allow pathogens to persist in the environment and spread from calf to calf. Good ventilation and drainage are key to reducing pathogen build up.

Pen floor gradients need to be at least one in 20 (5%) to ensure adequate drainage. Pens should be laid out to ensure that drainage from the feeding area is running away from the bedding. This may require a drainage channel underneath the feeding area with good falls to a drain, usually outside the building.

The preparation of milk feeds and cleaning feeding equipment results in a large amount of moisture in the environment. Where possible, preparation and cleaning should occur away from where the calves are housed.

Bedding

It is important to provide sufficient clean, dry bedding to reduce contact between the calf and the floor and any soiled straw. Bedding is also important for thermal comfort. Calves like to nest and it is important they have sufficient straw to keep them warm and minimise stress. The calf's legs should not be visible when it is lying down.



Promoting calf health

Health has a critical impact on the success of any calf-rearing enterprise. The vet should be an important member of the farm team and advise on:

- Screening for and eradication of diseases, eg BVD
- Biosecurity
- Vaccination policies
- A health plan
- Quarantine procedures for purchased stock

Pneumonia

Pneumonia is estimated to cost the UK cattle industry more than £60m/year. These costs are associated with decreased productivity, higher levels of mortality and increased veterinary and labour costs.

Pneumonia can cause irreversible lung damage, meaning that even if an animal recovers, its lifetime performance will suffer and it will be more susceptible to future disease challenges.

The important viral causes of respiratory disease are Infectious Bovine Rhinotracheitis (IBR), Bovine Respiratory Syncytial Virus (BRSV) and Parainfluenza-3 virus (PI3).

BVD may also be associated with pneumonia in some herds, due to the negative effects it has on an animal's immune status. These viruses can cause disease by themselves or damage the defence mechanisms of the upper respiratory tract, predisposing the lungs to secondary bacterial infections.

There is a variety of bacteria associated with pneumonia including *Mannheimia haemolytica*, *Pasteurella multocida*, *Histophilus somni* and *Mycoplasma bovis*.

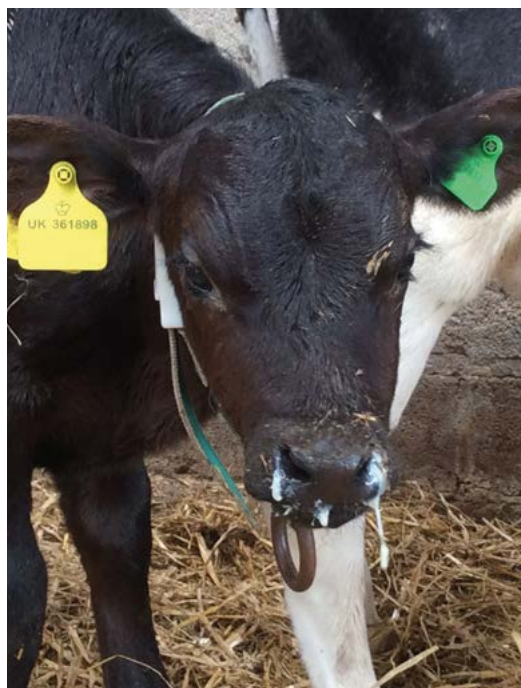
An accurate diagnosis of the cause(s) of pneumonia is important so that the correct treatment is given and steps can be taken to prevent future outbreaks.

Treatment

Treatment will be most effective if it is given as early as possible. It is important that animals with pneumonia are rapidly identified and treated correctly.

Look out for coughing, nasal discharge and laboured breathing. Take the temperature of suspected cases to help identify animals with disease. A temperature above 39.4°C indicates an infection is present.

When faced with an outbreak of calf pneumonia, the first priority is treatment of the affected animals and to minimise the spread of disease within the group.



Prevention

Preventing pneumonia in calves is always a better option than having to treat an outbreak.

Prevention consists of a vaccination programme as well as establishing and maintaining management practices that reduce the risk of disease.

Mixing animals of different ages, or from different sources, within the same airspace will increase the risk of respiratory disease.

Vaccines are now available that will provide effective control of the common viral and some of the bacterial causes of pneumonia. They should be used before high-risk periods to minimise the risk of disease.

Vaccination programmes need to be tailored to the circumstances on individual farms. Care must be taken to ensure vaccines are handled and administered in accordance with the manufacturer's recommendations to ensure their effectiveness.

To reduce the risk of pneumonia it is important that sheds are well ventilated. Do not underestimate the impact of the environment. If the housing is poor, even high levels of immunity will not prevent infection.

Mycoplasma

Mycoplasma is a bacterium that can cause pneumonia and ear, eye and joint infections. It is brought in by infected calves and can spread rapidly between calves using shared teats and through respiratory secretions.

Rapid identification and early treatment are crucial to reducing spread and minimising long-term damage.

Symptoms of mycoplasma are:

- Depression, reduced movement and feed intake
- Fever
- Cough and other signs of pneumonia
- Arthritis, seen as lameness and swollen joints
- Ear infection
- Droopy ears – one or both
- Discharge from the ear
- Head tilts and loss of balance



Promoting calf health

Joint-ill or navel-ill

Joint-ill or navel-ill usually affects young calves as the infection enters through the umbilical cord. Signs of the disease depend on where the bacteria has spread to, but typical signs include:

- Swelling around the navel
- Abscess which may have pus
- High temperature
- Decreased appetite
- Swollen, hot joints



Joint-ill

Scour

Calf scour (diarrhoea) is the most common disease in young calves, accounting for about 50% of all calf deaths. The disease can be easily recognised and it is important that treatment is administered rapidly to maximise the chance of survival.

There are a number of different infectious organisms that can cause scours including cryptosporidiosis, rotavirus, coccidiosis, coronavirus, *E. Coli* and salmonella.



Navel-ill

Treatment and isolation as early as possible will prevent the spread of infection. Antibiotics and painkillers should be given to affected animals and the full course given as prescribed.

Having a clean calving area is important for preventing infection. Cows should be in a clean, well-bedded pen. The calf's navel should be treated with iodine as soon as possible after birth, and again four to six hours later.

As with other diseases, it is essential calves receive enough colostrum to reduce infection risk.

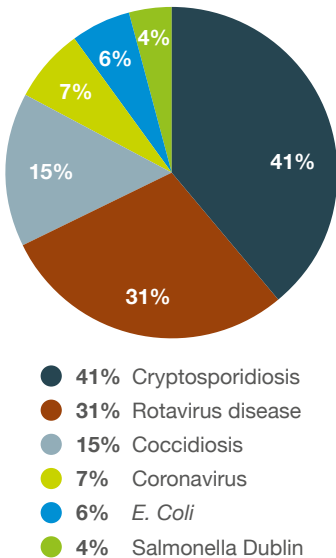


Figure 1: Distribution of organisms causing scours

Source: APHA with the provision of VIDA data

Not all scours are caused by infectious organisms. Calves will sometimes show nutritional scours, caused by inconsistent feeding. These can be minimised by ensuring milk is always prepared and fed in the same way and at an appropriate concentration.



For all causes of scour, treatment is focused on rehydration and prevention of acidosis that occurs due to fluid loss from the calf's digestive tract. Feed one to two litres of electrolytes two to four times a day. Continue to offer scouring calves normal amounts of milk or milk replacer as long as they want to drink. It is essential that treatment is started as soon as scour is observed. Delay will substantially increase the probability of treatment failure.

Isolate infected animals to reduce the risk of spreading disease to other calves in the group.

Laboratory analysis of faeces will be able to determine the cause(s) of scour. This will ensure the correct treatment is given and enable measures to be put in place to minimise reoccurrence in the future.

Vaccination of the cow prior to calving can help reduce the prevalence of scours in calves by ensuring there are specific antibodies present in the colostrum.

Coccidiosis

Coccidiosis is a disease caused by *coccidia*, which are small parasites that damage the lining of the intestine. It is spread by calves eating, drinking or licking contaminated feed, water or objects.

Coccidia can be found on most cattle farms and are able to survive in the environment from one year to the next.

Signs will depend on the severity of the infection. In the most severe form, calves will pass diarrhoea containing blood or mucus. These animals will show signs of dehydration and may be seen to strain to pass faeces.

Less severely affected animals will show signs of ill thrift and are frequently observed to pass a pale, pasty scour. These calves will have reduced feed intakes and poor growth rates.

Diagnosis is based on the presence of clinical signs in a group of calves and through examination of faecal samples. Contact the vet if coccidiosis is suspected, as they will be able to advise on the diagnosis and correct treatment.

The most effective method of minimising coccidiosis is prevention in the form of good hygiene and maintaining appropriate stocking densities.

Cryptosporidiosis

Cryptosporidiosis is one of the most common causes of calf scour (see Figure 1 on page 16). Calves are usually infected with the *Cryptosporidium* parasite shortly after birth and develop scour at around five to seven days old. There are four *Cryptosporidium* species which infect cattle, however the main disease-causing species is *C. parvum*. Humans are also susceptible to infection by *Cryptosporidium*, when handling infected cattle.

Signs

The main signs of cryptosporidiosis include watery yellow scour, dehydration and reduced feed intake. Suckled calves will also cease sucking and may lay separately from the rest of the herd.

Diagnosis

Diagnosis is done by identifying *Cryptosporidium* eggs in faeces. If you have scouring calves consult your vet to get an accurate diagnosis as treatments differ depending on the bug(s) involved.

Prevention of scours

Hygiene is paramount in the prevention and control of calf scours. Specific care should be taken to clean and disinfect

feeding equipment between feeds and to thoroughly clean the environment on a regular basis and between batches of calves.

For the prevention of *Cryptosporidium*, use *Cryptosporidium*-effective and licensed disinfectants (KenoTMcox, hydrogen peroxide, Neopredison, Ox-Virin) as many common farm disinfectants are not effective.

Identifying health problems early reduces the severity and duration of the disease and its spread to other calves.

- Use the chart on page 19 to check the health of calves twice a day
- Record and monitor these early signs of disease
- Treat if necessary following the advice of the vet
- Take preventative or corrective measures

(Based on information provided by Volac)

Table 3. Equipment cleaning process

Step	Solution	Temperature	Result
Rinse	Water	32–38°C	Dirt and milk residues removed
Soak	Chlorinated alkaline detergent solution	54–57°C	Kills bacteria and lifts milk proteins
Scrub	To remove residues		
Wash	Water	>49°C	Prevents dirt particles re-attaching to equipment
Rinse	Acid sanitiser	Follow manufacturer's instructions	Prevents growth of any remaining bacteria
Dry	Equipment raised onto drying racks		

Identify problems early

RESPIRATORY

Signs of good health and vigour

- Bright • Playful • Curious
- Keen to drink milk



- Clear eyes and nose
- No Cough

Normal temperature
(38–39°C or 100–102°F)



Look for early signs of disease

- Quiet • Slow to stand
- Still drinking milk



- Discharge from eyes and nose
- Cough on movement

High temperature
(>39.4°C or 103°F)



Late signs of disease

- Dull
- Reluctant to stand unaided
- Off milk

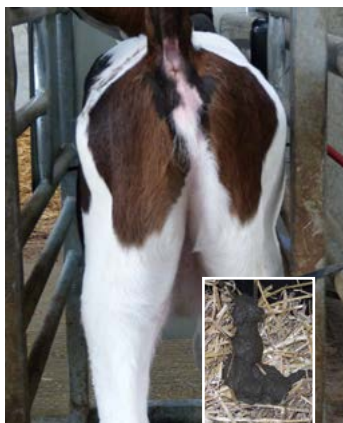


- Severe discharge with pus
- Frequent coughing/wheezing

High temperature
(>39.4°C or 103°F)



SCOURS



- Clean hindquarters
- Well formed faeces

Normal temperature
(38–39 °C or 100–102 °F)



- Dirty hindquarters
- Loose faeces

Variable temperature



- Wet hindquarters • Hair loss
- Dehydrated • Watery faeces

Variable temperature



ACT NOW

Implement the treatment plan
agreed with your vet

Information supplied by Volac.

Minimising stress

Disbudding and castration

Disbudding should take place as soon as the horn buds can easily be identified, within the first two months of life. At this stage, the horn buds are not yet attached to the skull, so the procedure involves less tissue trauma and is less stressful.

The most common way of disbudding calves is using cauterisation, ie a heated disbudding iron, performed under local anaesthetic at the site of disbudding. It is also a good idea to give calves an injection of a non-steroidal anti-inflammatory painkiller and to use an antibiotic spray after disbudding to reduce infection risk.

There are three main methods of castration, including the application of a rubber ring, bloodless castration using the Burdizzo method and surgical castration carried out by a vet. Animals over two months of age should be castrated by a vet.

To minimise the negative impact of castration on performance it is important the procedure is carried out as early as possible.

Transition to growing unit

Following weaning, the next potential stress point for calves will be moving from the rearing unit to a growing/finishing unit.

Periods of stress can result in disease outbreaks and reduced growth, so it is important they are managed to run as smoothly as possible.

Any change in ration should be made gradually over a period of two to three weeks. If possible, feed the calves the same ration they were on in the calf-rearing unit on arrival, then gradually introduce them to their new diet. The rumen takes time to adjust to fermenting new feeds, so abrupt changes can cause a growth check.

On arrival at the growing unit calves should be housed in a suitable shed that is clean, freshly bedded and well ventilated. Arriving cattle should not be mixed with other stock. Avoid placing them in the same airspace as animals that are already on the farm.

Transport is recognised as a risk factor for diseases such as pneumonia. Only transport healthy calves and use licensed hauliers to minimise stress. The use of vaccines can reduce the risk of some diseases, but will need to be given before the animals move off the rearing unit so they have time to take effect.

It is important to know the disease status of both the calf-rearing unit and the calf-growing unit. If the calf-growing unit has had history of problems such as clostridial diseases, eg black leg, it would be worth considering vaccinating the calves for this before moving them from the calf-rearing unit.



Monitoring performance

Monitoring calf performance is important for identifying where a system is working well and where improvements may be required. In calf rearing, daily liveweight gain (DLWG) is one of the most important indicators of performance.

DLWG
(kg/day)

=

Finish weight – start weight

Age (days)

Monitoring growth can be achieved in a number of ways. The gold standard would be to weigh the animals, but using weigh bands or measuring an animal’s height can be used as a quick guide.

Work out a monitoring programme that fits with the system. Weighing can be timed to coincide with other routine procedures and measuring at least twice through the rearing phase will provide enough information to monitor progress.

Overall growth targets can be adjusted according to breed type and management system. Breed-type differences are shown in Table 4. Over their entire growing period uncastrated bull calves tend to have a 12% advantage in growth rate over heifers, although for the first few months of life the difference is not as apparent.

Table 4. Growth targets according to breed type.

Calf age (weeks)	Breed-type		
	Native-type	Holstein	Continental-type
2	50	53	55
8	80	83	85
12	100	102	105
15	117	119	122

Notes: Weights based on a 45kg birthweight

As well as monitoring growth it is important to be aware of any disease problems on the farm. Keep a record of calves showing signs of ill health, cases of disease and losses.

Speak to the vet and set benchmarks for the number of times common conditions such as pneumonia and scours are treated. This will give valuable information about health issues and monitor the impact of changes made to improve calf health.

Table 5. Key targets for calf rearing

Key performance indicator (KPI)	Target
Number of calf deaths per calf reared	<2
Number of cases of pneumonia per calf reared	<15
Number of cases of scour per calf reared	<10
Calf liveweight at weaning	>Double birthweight
Daily liveweight gain to weaning	>0.7kg/day
Daily liveweight gain post weaning	>1kg/day

Beef BRP Manuals

Manual 1	Choosing bulls to breed for Better Returns
Manual 2	Marketing prime beef cattle for Better Returns
Manual 3	Improving cattle handling for Better Returns
Manual 4	Beef production from the dairy herd
Manual 5	Feeding suckler cows and calves for Better Returns
Manual 6	Improve beef housing for Better Returns
Manual 7	Feeding growing and finishing cattle for Better Returns
Manual 8	Optimising suckler herd fertility for Better Returns
Manual 9	Controlling worms and liver fluke in cattle for Better Returns
Manual 10	Better Returns from pure dairy-bred male calves
Manual 11	Managing replacement heifers for Better Returns
Manual 12	Better Returns from calf rearing

See the AHDB Beef & Lamb website beefandlamb.ahdb.org.uk for the full list of Better Returns Programme publications for beef and sheep producers.

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