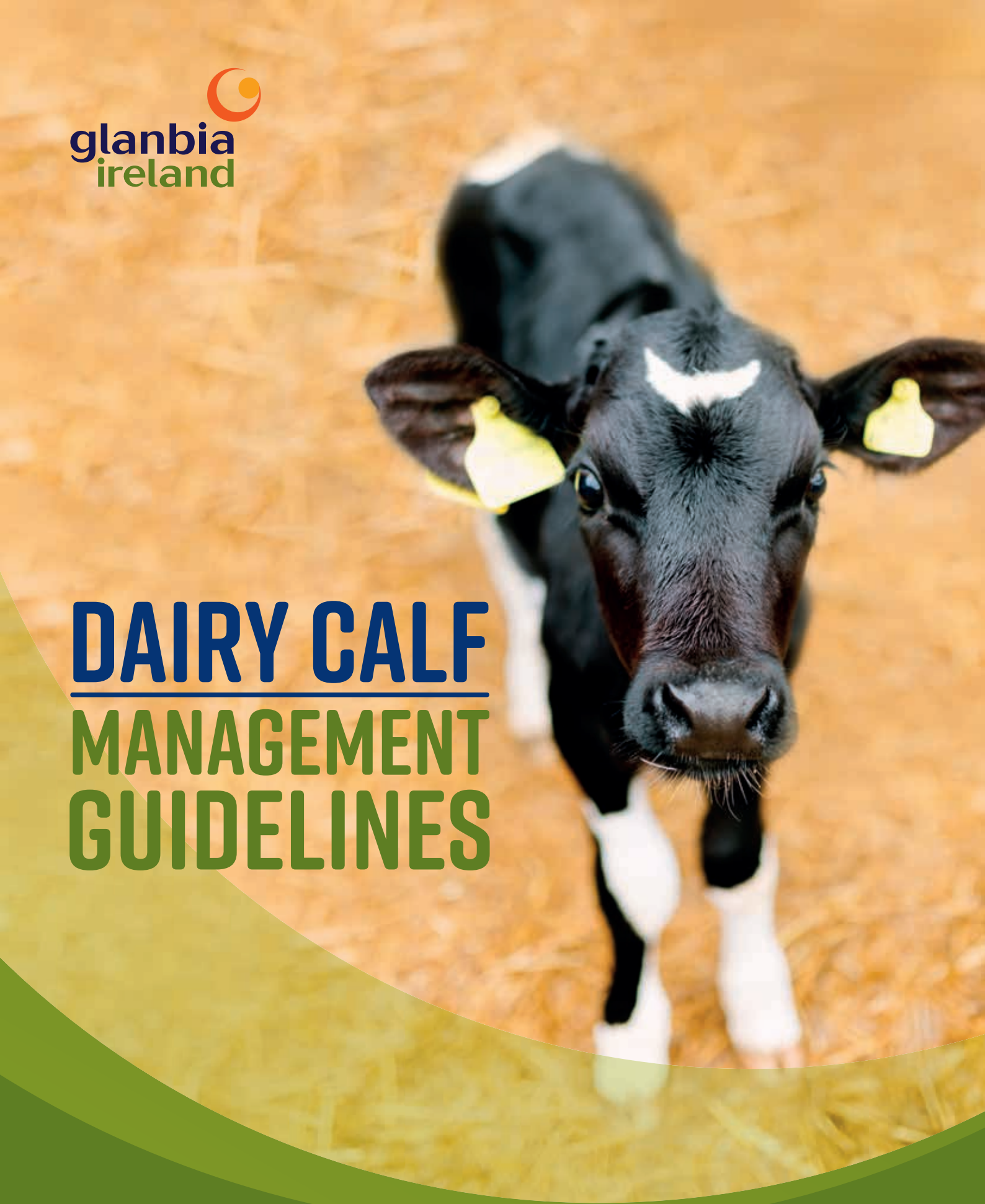
glanbia ireland



DAIRY CALF MANAGEMENT GUIDELINES

GOODNESS GROWS HERE

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November 2019



INTRODUCTION

The commitment of Irish farmers to the animals in their care and our outdoor grass-based milk production system ensures that the health and welfare of animals in Irish dairy herds sets a leading standard internationally.

Good calf management is part and parcel of good dairy farming practice, planning and economics. The first 12 weeks in a calf's life are crucial to the future production potential as well as the length of the animal's productive life.
The proper management of newborn and young calves is also an essential part of Glanbia Ireland's standards for our producers.

Glanbia Ireland has drawn together best practice guidelines from our own technical team, including veterinarians, to assist suppliers in achieving the highest standards of animal husbandry. The calf management guidelines should be read in conjunction with our Milk Purchasing Policy which sets out the high standards that suppliers must follow. Further advice and guidance is available from key advisory bodies such as Teagasc and Animal Health Ireland.

Half of calf mortality due to illness within the first year occurs during the first six weeks of life and high mortality rates not only reduce farm profitability but are also an indicator of substandard calf welfare.

The five freedoms that underpin best practice to ensure animal health and welfare at farm level. *www.fawac.ie*

1. Freedom from hunger and thirst.

2. Freedom from discomfort.

3. Freedom from pain, injury and disease.

4. Freedom to express normal behaviour.

5. Freedom from fear and distress.

Legal requirements and minimal standards are part of the Bord Bia SDAS audit.

Challenges

A number of challenges have arisen in line with the expansion in the average dairy herd size.

- Many farmers are under increased pressure for time and also for calf accommodation on their farm.
- It has resulted in an increase in the number of calves born from the dairy herd that are destined for beef production systems.
- In addition, there has been an increase in the number of cross bred dairy cows (i.e. Jersey/Holstein crosses) whose calves are of lower economic value.
- Calf rearing and breeding decisions must be made to ensure each calf born is treated with equal importance for the duration of their life.

How to assess your calves' welfare?

1. **Animal based parameters:** These include measures of the animal's reactions or responses to the calf rearing system, such as bodyweight for age, average daily live-weight gain, mortality figures, veterinary interventions, disease treatments and injuries.
2. **Environmental parameters:** These are specifications around husbandry practices such as navel dipping, disbudding and castration, and calf housing requirements such as space allowance per calf, bedding material and shed ventilation as well as milk and solid feed allowance and water access.

For further detail and guidelines on calf rearing, visit: www.fawac.ie www.teagasc.ie and www.animalhealthireland.ie



THE BEST START

Care of the newborn calf

Good indicators for the calf's vitality immediately after calving are the time it takes for the calf to lift up its head and the time it takes to make the first attempts to stand. In the case of a difficult calving there may be a need for resuscitation.

Once you are happy that the calf is breathing and alert, attention should go to preventing navel ill and other potential infections.

The spread of infection from the environment into the calf via the navel cord is the cause of navel ill. Preventing navel ill is based on a number of farm hygiene and calf care/immunity principles that must be optimised at and shortly after birth.

The navel should be checked for excessive bleeding after calving and for pain, abnormal swelling, foul odour or pus over the following days. If any of these are seen, treatment by your local vet has to be sought.

To prevent navel ill:

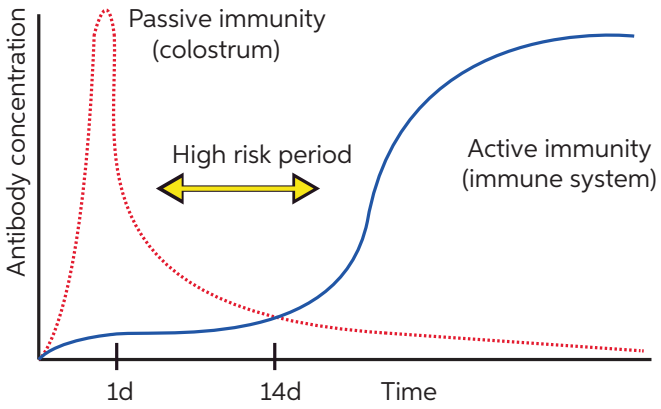
- Good maternity pen hygiene. Ensure calves are born in a clean, freshly bedded calving unit.
- Minimise the length of time a calf spends in calving pens.
- Follow the 1-2-3 and 3 Q's rules of colostrum feeding.
- Practice navel hygiene.
- Practice dipping or spraying with chlorhexidine or iodine if navel ill is a problem on farm and hygiene is already optimal. If problems persist, alter the product used, the method of application or focus more attention on hygiene in the calf's environment.
- Check the calf regularly for signs of navel ill over the following days.

Remove the calf from the calving pen and into a clean calf pen. This is in the calves' best interest because the calving pen is not a safe or suitable environment for small calves and minimises any separation issues for both calf and dam. The maternity pen is usually not as hygienic as needed for newborn calves. Once the calf is born, it is at immediate risk of picking up infections via the navel, mouth and nostrils from the calving environment, the dam and any other animals in the same airspace.

Unlike adult cows, with well-established immune systems, calves are born without a developed immune system. The first milk a cow produces, colostrum, is vital in the calf's ability to fight off infections, and this milk has to be provided as soon as possible and in ample volume. To assure adequate colostrum uptake by the calf, apply the 1-2-3 rule when it comes to colostrum feeding using either a nipple feeder or a stomach tube.

Colostrum is crucial

Did you know?



The calf is effectively born with no immunity. It also takes up to 3 weeks for the calf to develop an active immune system.

Good quality colostrum is essential to ensure an easier life for the calf as well as the farmer. Just follow the 1-2-3 rule:

1. **1st milk the cow produces after calving**
2. **Feed within 2 hours after birth**
3. **Feed at least 3 litres**

The only way to assure colostrum intake by the calf is adequate is by milking the cow shortly after calving and bottle-feeding the calf the necessary volume within the first two hours of life. If the calf struggles to take in the necessary amount, stomach tubing the colostrum provides a suitable alternative for this first feed.

The 3 Q's of colostrum feeding:

Quantity:

- At least 3 litres is given in first feed
- Second feed within first 8 hours

Quality: To test for quality use a colostrometer or refractrometer

Why? Not all colostrums are the same. Test the colostrum and only use or freeze the highest quality. Do not take any colostrum in from another farm.

Firstly, you don't know how good it is and secondly, you are potentially bringing in diseases. Only use colostrum from the first milking as the calf's first feed, as it will be far too diluted by the next milking.

The quality of colostrum may be enhanced by vaccinating the pregnant dam during the final 2 months of pregnancy, especially with a goal of increasing the level of protective immunoglobulins in colostrum against calf scour or other infections caused by Rotavirus, Coronavirus, E. Coli, Leptospirosis, IBR or Salmonella.

Measuring colostrum quality:

Using the colostrometer:

- Put fresh warm colostrum into a container, fill the container to the rim.
- Ensure there is no foam floating on top, as this will distort the reading.
- Gently lower the colostrometer in the full container.
- Take a reading from the rim of the container looking to the traffic light diagram on the neck of the floating colostrometer.
- If it reads green, it is adequate colostrum to feed to newborn calves.
- If it reads orange or red the colostrum is of inadequate quality to feed to newborn calves.
- Carefully take the colostrometer out of the container and clean. Care should be taken as the colostrometer is fragile.



Quickly:

Feed in the first 2 hours of life. Why? The calf's ability to absorb the necessary immunoglobulins significantly reduces after 12 hours of life.

Nutritional management

(Milk, Concentrates, Roughage, Water)

A typical 12-week calf rearing period can be divided into three phases:

0-4 weeks

a. The calf depends on milk or milk replacer for its nutrition. It is recommended to **feed calves 15% of their body weight in whole milk or milk replacer per day,** approximately 6 litres for Friesian calves, divided over at least 2 feeds. This level of milk feeding will result in calves reaching weaning weights earlier through achieving target average daily weight gain during the pre-weaning period.

b. Good quality, coarse starter concentrate should be available to the calves. They will only eat small amounts of solid feed in this phase, but it is crucial in the fore-stomach development.

c. All calves should have access to fresh drinking water at all times.

d. When the ambient temperature drops below 15°C, young calves will require additional milk or milk replacer to compensate for the energy used to keep warm. Once calves reach three weeks of age, this critical temperature drops to 5.5°C.

4-8 weeks

a. The three fore-stomachs of the calf are developing, allowing the calf to digest solid feed in increasing amounts. **Access to clean drinking water and good palatability of the concentrate will increase solid feed intake.** The calf's daily concentrate consumption will be lower if whole milk or milk replacer is fed ad lib or in high amounts (e.g. 20% of body weight).

b. The entire volume of whole milk or milk replacer can be fed once-a-day if calves are fed adequate amounts of fresh concentrates daily.

8 weeks onward

a. The calf is no longer depending on milk or milk replacer to fulfill its nutritional requirements.

b. It is vital that the calf is consuming enough concentrates before it is weaned off milk or milk replacer. Calves should only be weaned once they are consistently consuming at least **1 Kg of starter concentrate** per day to avoid a growth check after weaning.

c. Weaning should be a gradual process, reducing the volume of milk over a week to 10 days. This can be achieved by moving from twice daily to once-a-day milk feeding and by gradually reducing the volume fed over the subsequent days. Mixing of age groups, disbudding or castration should not take place in the weeks before or after weaning to prevent a growth check. These additional procedures will cause excess stress for the calves which could lead to immunosuppression and increased likelihood of disease.

Teagasc research

The amount of milk fed and concentrate intake determines calf growth rate in the period up to 12 weeks, with the target being to get the calf to grow from 40-45kg at birth to about 100kg. This can be achieved with inputs of about 25kg of milk replacer and 120kg of concentrates. If higher levels of milk replacer are given (50kg or more as in ad lib systems) the calf weight at 12 weeks will be 105-110kg. Concentrate intake per calf will be approximately 100kg.

Feeding 'waste milk'

Waste milk is whole milk that is unsaleable due to insufficient quality or presence of antibiotic residues. Waste milk is not a suitable feed for calves as this milk often contains antibiotics or high bacteria loads.

Antibiotic residues in milk can make waste milk unpalatable to calves, with high rejection rates by calves resulting in poor calf growth. In addition, antibiotic residues in waste milk fed to calves plays a role in creating antibiotic resistance in bacteria such as E. coli and can also cause stomach upsets. Speak to your local GI representative for further information and to plan for the nutritional needs of your calves.

Out-wintering pads

An out-wintering pad (OWP) is an alternative method of accommodating livestock to conventional sheds. OWPs must be carefully managed, particularly if they are in use at key times such as calving. Indoor calving facilities should always be available on the farm. Weather is a key determinant of appropriate usage of a pad. In harsh weather conditions, use of the pad should be carefully considered. Young calves are particularly vulnerable to colder temperatures (see above) and should be housed appropriately.

Rumen development

The rumen is the engine of the cow and the sooner we start this engine the sooner we will have a cow.

Research shows that the earlier the rumen starts developing the sooner the heifer will calve in and the more she will produce in her first lactation. Starch is required to get the rumen to develop so it is important to introduce the calf to ad-lib concentrate feeding from 2 or 3 days of age and always give them access to clean, fresh water. Access to small amounts of hay, straw or other chopped roughage may be necessary when feeding pelleted concentrates and will discourage calves from eating dirty bedding and cross-sucking.

Did you know?



Milk Only



Milk & Concentrate



Milk & Hay

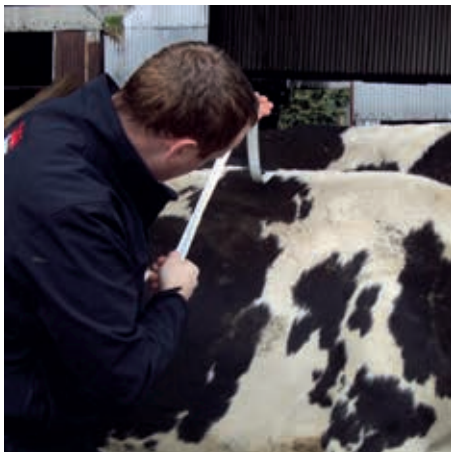
It is essential to get rumen development started as quickly as possible and to do this we need to introduce concentrate to the calf from 2 or 3 days of age. Milk only or milk and hay diets will not get the rumen (the growth engine) started in time. It takes starch from a young age to get this engine kick started.

First three months

Monitoring daily weight gains

Weights should be recorded and comparisons made against targets.

How to use a weight tape



Make sure the animal is adequately restrained and that your safety is not at risk.



Drop the tape down the far side of the animal and pull around the chest, making sure the tape is just behind the elbow of the calf.



Bring the end of the tape up to the side of the animal and align with the measurement markings to obtain a reading.

Growth rate targets for dairy and dairy/beef

Dairy replacement heifers

- Average daily gain of 800g per head per day essential to maximise future production
- Double the birth weight by ten weeks of age
- Target of 60% of mature body weight at heifer breeding
- Target of <15 months heifer breeding age

Dairy to Beef calves

- 1 week: 48 Kg
- 6 weeks: 73 Kg
- 12 weeks: 102 Kg
- 15 weeks: 120 Kg

During the first and second grazing season, faecal egg count testing results should be used in combination with calculated growth rates to determine the need for worm dosing of calves. GI offer a faecal egg counting service that provides an answer to the question: to dose or not?

CALF HEALTH



Vaccination protocol

A vaccination plan is a key component of a health and welfare programme. Advice should be sought from the farm veterinary practitioner when deciding on a vaccination programme for a particular disease. This includes advice on vaccine type, dose, timing of vaccination, and method of administration.

The use of vaccines is the main method in preventing clostridial diseases such as blackleg and tetanus and plays an important part in the prevention of calf scour and pneumonia. However, it should not be regarded as the sole method of preventing scour or pneumonia, with good hygiene and nutrition also of importance.

Main disease risks

Scour

Calf scour is still the most common health issue among young calves. It causes major financial losses, as well as stress and an increased workload. Scours in the young calf are caused by a variety of infectious agents including parasites, viruses and bacteria. When scour occurs, the mucosa of the intestines gets damaged which causes a loss of fluid and salts, resulting in the calf becoming dehydrated.

The most important principle for the treatment of the diarrhoeic calf is the replacement of lost fluids (rehydration) and salts (electrolytes)

Key actions to consider

1. **Removing the scouring calf from the group:** This prevents infection from spreading to other calves, but it also facilitates control, handling and management of the sick calf.

2. **Rehydration:** Fluids and electrolytes are best provided as electrolyte solutions that are given in an additional feeding, e.g. at noon. You can safely give these solutions by stomach tube if the calf refuses or is unable to drink.

3. **Milk feeding:** For the provision of energy and nutrients, the scouring calf needs as much milk as the healthy calf.

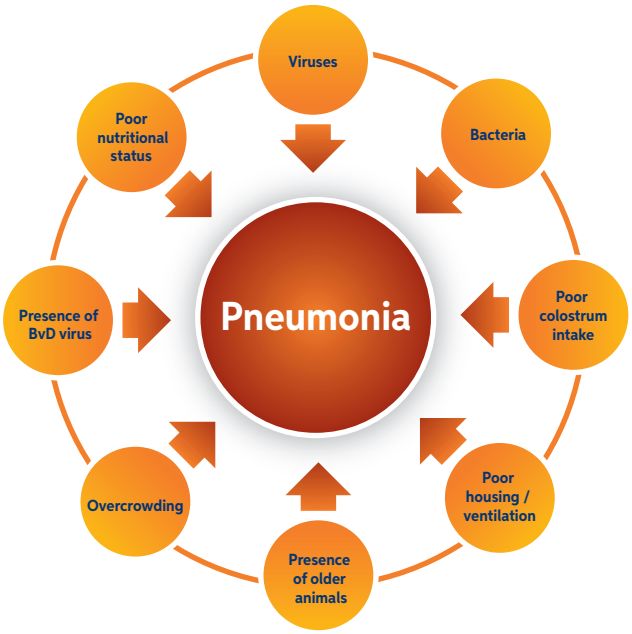
Keeping calves on milk while they are scouring will not worsen or prolong diarrhoea and can aid in recovery. Milk withdrawal, however, can lead to loss of condition, therefore, the normal feeding regime should be maintained. As long as calves are up and drinking no further treatment beyond these steps is required.

Antibiotics do not work against the parasites and viruses that are the most common causes of calf scour.

Thus, it makes no sense to treat calves with antibiotics just because they are scouring. If antibiotics are used when they are not needed, there is a good chance they won't work if, in the future, the calf has an infection that does require antibiotic treatment. When a calf is down, not drinking and/or their eyeballs are sunken, a veterinary practitioner should be called for further treatment.

Pneumonia

Pneumonia is often referred to as a 'multi-factorial disease'. Besides infectious agents, nutritional and environmental and management factors may also be responsible for the outbreak of disease.



Early diagnosis and treatment of pneumonia is essential for a successful outcome. Symptoms include increased respiratory rate, dullness, reduced feed intake, discharge from the nose/eyes and high temperature. When pus-like nasal discharge or severe respiratory distress is noted the disease may be advanced. Careful observation of calves at a time when they are resting (not at feeding time) is required to pick up these signs.

Viruses associated with pneumonia include IBR, RSV and PI3; bacteria include Mannheimia haemolytica and Pasteurella multocida. Veterinary advice should be sought on the treatment and control of pneumonia. The most important factor for a successful outcome is to start treatment as early as possible in the course of the disease and to treat for the necessary period of time; by failing to do so, the calf may relapse with recurrent bouts of pneumonia.

Prevention of pneumonia is better than treating outbreaks, and resistance of calves is enhanced by ensuring good colostrum intake and nutrition, controlling scour and avoiding stress. If vaccination is prescribed ensure that vaccines are stored and used as recommended to ensure maximum efficacy. High risk periods for pneumonia outbreaks coincide with stress inducing conditions, such as at grouping or mixing of groups, housing, transport, weaning, or unfavourable weather. No matter what system is used for calf housing, to prevent pneumonia it is important that every effort is made to minimise stress among calves, provide access to plenty of fresh and clean air, without draughts, and a good, clean, dry, well-bedded lying area. The GI Herd Disease Screening service will provide evidence of IBR present in your herd.

Johne's Disease

Johne's Disease is caused by a bacterial infection commonly called MAP. Calves usually acquire MAP infection by mouth from colostrum, milk and feed, water or the general environment contaminated by dung or slurry from an infected animal shedding MAP. Calves born to infected cows may already be infected by the time they are born. Calves are most susceptible to MAP infections, with the risk of becoming infected reducing as the animal gets older.

Some common management practices can dramatically increase the rate of spread of Johne's disease on a farm from one infected cow to several calves:

- Inadequately cleaning pens between calvings;
- Feeding pooled colostrum or whole milk that has been contaminated with faecal matter;
- Group calving pens;
- Shared accommodation between adult cows and several calves / youngstock;
- Spreading slurry from infected cows on land grazed by calves / youngstock.

The AHI Irish Johne's Disease Control Programme provides guidelines on which measures to take to limit the spread of MAP in your herd.

Transporting calves

The following key considerations must be borne in mind:

- Calves must be bright and alert, hooves worn and firm, have a dry navel and no scours.
- Calves must be able to stand and bear weight on all four limbs and be fit enough to withstand the journey without suffering unreasonable or unnecessary pain or distress.
- Pre-weaned calves must have been fed at least half of that day's ration of milk, not more than two hours before transportation.
- Transport conditions must not cause injury or unnecessary suffering.
- Journey length – calves must be at least 10 days of age if undergoing journeys >100km.
- Journey time – the transportation of calves less than 14 days of age on journeys exceeding eight hours is not permitted unless they are accompanied by their mother.
- Weather conditions.
- If animals fall ill or are injured during transport, they must be separated from the other animals and receive treatment promptly.

PAINFUL HUSBANDRY PROCEDURES



Calf rearing involves a number of husbandry procedures such as applying identification tags, disbudding, dehorning and castration which cause pain and distress. These procedures must not be performed on sick animals and should be performed as early as possible. They must never be performed simultaneous to other stressful events such as weaning, mixing or transport. The docking of calves' tails is prohibited and must not be carried out.

Tagging

DAFM requires the application of two identically numbered yellow plastic ear tags to calves born on a holding within 20 days of birth. In practice on dairy farms, it is expected that calves would be tagged at a much younger age than this.

Disbudding

The only method of disbudding of calves that is legally permissible in Ireland is disbudding by thermal cauterisation up to 28 days old. It is illegal to disbud or dehorn calves over 14 days old without using a local anaesthetic. GI's best practice recommendation is that local anaesthetic and an NSAID pain killer, obtained from your local vet, should be administered to all calves undergoing disbudding. Caustic dehorning paste must not be used.

Once you have injected the anaesthetic then you need to wait 5 minutes for the anaesthetic to start working. So in a large group of calves the most efficient system is to restrain and anaesthetise calves, let them go and catch them again to disbud them. The anaesthetic will work for 90 minutes.

Always check that the horn bud is desensitised before applying the iron – poke a needle round the base of the horn bud. If the calf reacts then it needs more anaesthesia and/or more time. You must always check both sides as just because one horn is desensitised doesn't mean the other is as well.



The best place to inject anaesthetic is halfway between the horn bud and the corner of the eye. Feel for a bony ridge in this area and insert the needle up to its hub in the groove under this ridge. Inject 5ml of anaesthetic, then repeat on the other side. Before injecting any local anaesthetic always draw back slightly on the syringe plunger to ensure you are not injecting directly into a blood vessel by mistake.

Cost of local anaesthetic: < €1/calf

Cost of NSAID: < €2/calf

Dehorning

Only a veterinarian is allowed to carry out dehorning.

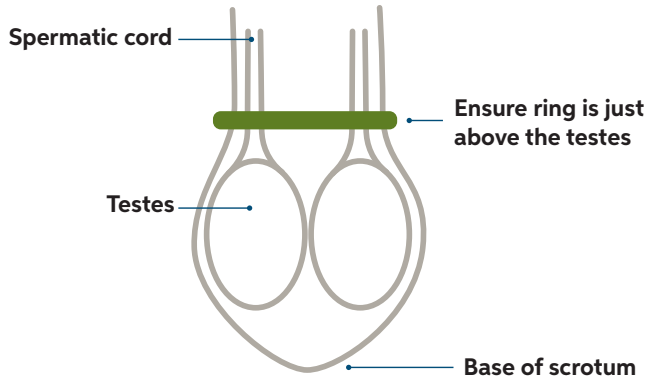
Castration

If bull calves are castrated on farm, it is recommended best practice to castrate calves up to 7 days old using a rubber ring around the neck of the scrotum.

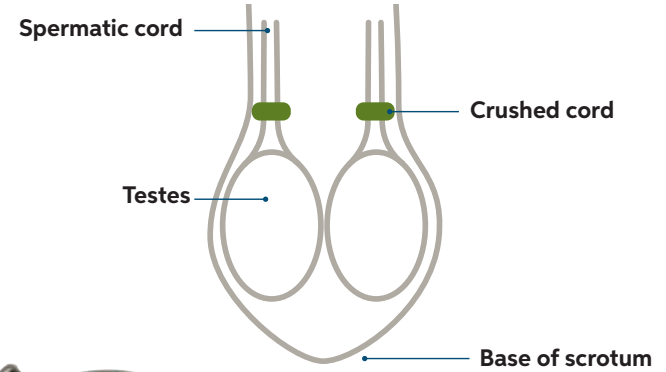
The keys to ensuring rubber rings work for you and the calf are:

- **Use new rings** – old rings may have lost their elasticity and won't work as well.
- **Use clean equipment** - dirty elastrators and rings increase the risk of infection.
- **Only use rubber rings in calves < 1 week of age** - more pain and distress and an increased risk of complications, particularly tetanus, is seen in calves castrated using rubber rings at an older age.
- **Make sure that the calf can't kick you or turn around easily.** Once you have the calf restrained, the first thing to do is check that both testes are present in the scrotum. Occasionally, you may be able to massage them down if they are not. If you can't get both testes, record the calf's number but do not castrate the calf.

Rubber ring method: *the scrotum after correct rubber ringing procedure*



Burdizzo method: *The scrotum and where the burdizzo should be clamped during the procedure*





Burdizzo

Where calves are castrated by Burdizzo emasculator ("Squeezing") without the use of anaesthetic, they should be castrated as young as possible and certainly no older than two months of age.

The keys to ensuring emasculators work for you and the calf are:

- **Use clean equipment** - dirty emasculators increase the risk of infection.
- **Proper restraint** - use a crush or disbudding crate if you have one. The calf needs to be kept still during the procedure.
- **Clamp one side then the other** - do not clamp across the full width of scrotum. Make sure that the clamp lines do not cross the scrotum in a single line.

Method:

- Stand behind the calf, grasp the scrotum and check that there are two testes. Do not castrate the bull if only one testicle is present (contact your vet instead).
- If there are two testes, push the left spermatic cord to the outer edge of the scrotum.
- Open the emasculator and hold it so that the C-shaped side of the jaw is facing up.
- Place the emasculator so that the left spermatic cord runs between the jaws. Get the cord as near to the right hand side of the jaws as possible. The aim is to crush as little of the scrotum as possible.
- Close the jaws and hold them in place for at least 5 seconds.
- Repeat on the right hand side, clamping the emasculator below the level of the first crush line.

- **Whichever method is used, castration is painful and you need to think about pain relief. Anaesthetics and NSAID painkillers obtained from your local vet should be used with all methods of castration for calves at all ages. The continued weight gain of the animals in the days after castration far outweighs the small financial cost of this pain relief. The lack of pain induced stress on the calves also makes the calves less susceptible to diseases such as pneumonia following castration.**
- **Injecting 2ml of local anaesthetic into and around both spermatic cords a few minutes before clamping the emasculator will significantly reduce the pain of castration.**
- **NSAIDs: Injecting the calf with a few millilitres of ketoprofen, flunixin or meloxicam at the time of castration will provide pain relief following castration.**
- Where calves are over six month of age castration is not recommended. If needed this must be carried out by a veterinarian and using anaesthesia and long-acting analgesia.
- Castrated animals should be checked frequently during the days following castration to detect any signs of infection or bleeding.

CALF HOUSING



What adaptations can you make to your existing calf shed?

Small adaptations can help deliver major improvements to your calf shed.

For any calf shed we want to try to control moisture and air movement. There are several things farmers can do to assess their current housing facilities.

To assess air movement within a calf shed, crouch down at calf level in the pen to check if you can get a smell of ammonia, or think back to what the shed was like last year. If you can get a smell then the air movement in the shed is not good enough, which in turn means bacteria and airborne contaminants are not moving away from the calf.

We also have to try to prevent draughts within sheds. If calves are lying randomly throughout a pen it is a good sign that there are no draughts at calf level. However, if they are avoiding certain areas it may require further inspection

Warm environment

The lower critical temperature of a calf is the temperature below which an animal has to burn additional energy to keep warm. For calves over 4 weeks of age, this is below 15C.

Air movement of less than 0.2m/s is described as draught-free. Providing calves with a good deep bed of straw while protecting them from draughts will help them stay above their lower critical temperature.

One option for large openings in sheds is to install a windbreaker. Where you are installing one that can stay fixed for the winter then it can be ratcheted into place. The void area of a windbreaker can vary, but they are generally 20% to 25% which will still ensure a good movement of controlled air, while preventing draughts.

Where calves are housed in mono-pitch sheds with an open front then a fixed windbreaker may not be an option. There are a few different options that can be explored here, either a sliding windbreaker that would be pulled across between two stanchions, or a windbreaker on a roller.

The third option is to install a full windbreaker roller door.

Yorkshire boarding

The other options that more farmers are looking at installing to provide inlet ventilation for calf sheds are Yorkshire boarding and spaced boarding. There can be a massive variation in the void area of vented sheeting, 5% void all the way up to 18% void, which can mean a major difference in the amount of fresh air that enters a shed.

Ventilation options

Spaced boarding is made up of a single line of boards with a gap no larger than 25mm between the boards. Different sized boards can mean a different void area. For example, a 100mm board and a 25mm gap will give a void area of 20%. If we want to further increase ventilation we can use a 75mm board and a 25mm gap; this gives us a void area of 25%. Spaced boarding may be useful on a sheltered side of the shed.

However, for more exposed sites then Yorkshire boarding should be used. It will still allow air to move through while preventing driving wind and rain from entering the shed. Yorkshire boarding is made up of two rows of vertical boards offset on either side of a purlin. Firstly the maximum gap that can be left between the two lines of boards is 50mm. If this is any larger, rain may be able to get through. The recommendation is to use a 150mm board and a 40mm gap. Using this design will still provide a 20% void area in your boarding.

To remove vented sheeting, supply and fit Yorkshire boarding is approximately €70/linear metre, for a 2m high section, as quoted by a builder. This would equate to a cost of €336/bay of a shed. To remove vented sheeting, supply and fit spaced boarding costs approximately €50/linear metre, again for a 2m high section. This would equate to a cost of €240/bay of a shed.

Moisture

Reducing the moisture in pens should also be examined. The best way to do this is to ensure a good floor slope in pens with drains running along the front of pens.

Installing a floor slope with a 1:20 fall will help to bring moisture quickly to the front of the pen and away from calves. To remove the current concrete floor and replace with a 1:20 fall costs approximately €35-40/square metre. For a 4.8m by 4.8m pen this would cost approximately €864/pen. It is important that the old pen is dug up for the front 1.5m at least to ensure the new concrete can be well binded in.

Fan and duct

A fan and a duct to ensure adequate ventilation on a still day is required for most calf sheds in Ireland. However, for an existing shed they may be a very cost-effective way of improving airflow.

For sheds with low roofs in particular it may be the only option to improve airflow. Running costs could be approximately €90-113/year depending how much it is used. However, where a fan and duct system is being used then calf jackets for the first few weeks of life may also be required to prevent chills.

The benefits of Automatic Calf Feeders

Automatic Calf Feeders can yield major benefits on farm by monitoring and allowing calves to be managed individually.

In addition to saving on labour, the system can ensure consistency in feeding as it monitors temperature, volume and quality of milk which can often be difficult in traditional group housing systems.

Finance will now be available through the Glanbia Ireland FundEquip scheme for Automatic Calf Feeders through a number of major suppliers. The scheme allows dairy farmers to spread the cost of critical infrastructure and equipment over a period of time.

The equipment also monitors drinking speed and will sound an alarm if feeding behaviour changes, which allows for quick response and intervention to prevent any issues arising.

Calves are individually identified and can access their portions optimised for their age and specific needs at any time stimulating natural feeding behaviour.

Healthy, correctly fed calves grow vigorously and achieve their targets for daily liveweight gain.

The automatic cleaning features also ensure the highest level of hygiene.

It allows considerable labour savings and creates an opportunity to manage time on farm and structure the working day independent of calf feeding times.







Roller doors give easy access for cleaning out and bringing in straw and feed.

Planning is key to deliver efficient comfortable calf housing

Roller doors, automatic feeders, a good drainage system and layout all contribute to deliver efficient and comfortable housing.

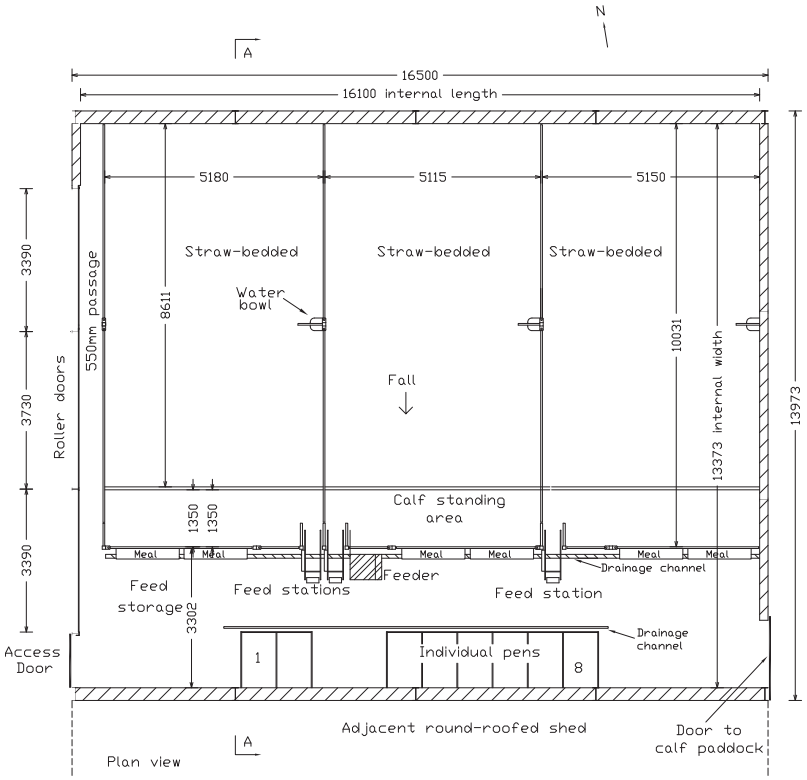
The calf house, pictured in the drawings and photos, accommodates 100 calves and works out at around €357/calf. It was designed by Garry Ducey, with suggestions from Vincent Dorney, O'Donovan Engineering, Noel Coughlan, his builder, and Owen Power, his Teagasc adviser. Glanbia Ireland supplier Garry Ducey farms near Ardmore, Co Waterford.

The shed built in 2015 has a roof that is a 16.5m x 13.97m portal frame. The bays are smaller than usual, as the shed is attached to a pre-existing round-roofed shed. The floor plan is laid out to suit the automatic feeding system in the round-roofed shed.

The calves are kept in the individual pens for about five days before they are transferred to the group pens. There are three group pens and each caters for about 30 calves. There is a door on the east side leading to a calf paddock. The oldest group of calves in the pen nearest the door are allowed access to this calf paddock.

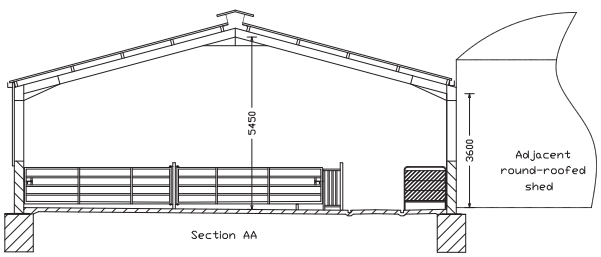
A similar calf house is in the Teagasc-run research farm in Kilworth. There, the calves have access to a woodchip area to give them a bit more room to lie out when weather permits.

The detailed drawings and photos of the Waterford calf house and the one in Kilworth are available through your Teagasc adviser.





Calves lying randomly throughout pen. Vented sheeting provides air inlet on northern side.



Feeding

The automatic feeder has three feed stations. Each feed station can handle about 30 calves. Obviously, with this system pen frontage length is not such an issue for milk replacer/milk feeding. There is plenty of pen frontage for the feed stations, meal feeding troughs and gates for access to the pens. Any filling, checking or cleaning the feeder is easily carried out from the access passageway. The feeder itself could have been located between some of the individual pens perhaps and this would have freed up access to the gate at the front of the centre pen.

Meal troughs are hanging from the barrier at the front of the pens. Straw/hay is available on racks on the pen divisions. Fresh water is readily available in drinker bowls mounted on penning posts.

Pen area and lying space

The area of each pen is about 51.5m2 or just over 1.7m² per calf. The straw bed makes up almost 1.5m² per calf of the pen area. The calf standing area is 1.35m wide (53 inches) which is ample for calves to access the feed station and meal troughs.

Meal troughs take up every bit of available space along the pen front to give calves every chance to access meal, especially coming up to weaning time. Garry cleans up the calf standing area every day. He wheelbarrows away any manure and straw from this area and brushes the floor and the channel clean.

Pen layout

The penning is designed in such a way that the calves can be confined to half the straw-bedded area along the back or the front of the pens to allow a tractor and loader to clean out built-up straw bedding. Two of the roller doors are opposite the front and back sections of the bedded area making access easy for cleaning out and bringing in fresh straw. The other roller door closest to the adjacent round-roofed shed allows a pallet with milk replacer/calf nuts to be conveniently placed in the feed storage area.

A pen division inside the roller doors keeps straw and calves back from the doors. Straw pressing up to the doors would make closing down the doors fully very difficult. The narrow passageway created also facilitates inspection of the calves.

The penning is designed so that it can be easily raised up as the straw bedding builds up and calves get bigger. This makes the divisions higher to contain the calves and makes room for the straw build-up underneath.



Calf standing area at 1.35m wide provides plenty of room for calves to access feeder and meal.

Effluent collection

There is a drainage channel in front of the 3 group pens. This collects any effluent, seepage and washings from the bedded and calf standing area. It also collects washings from the calf feeder and feed stations. A slit drain in front of the individual pens intercepts any seepage and prevents it from contaminating the access passageway between the group and individual pens.

Ventilation

The farm is situated about a kilometre from the sea so there is no shortage of wind to ensure plenty of air changes and fresh air in the calf house. The roller doors are facing the West. The side facing North is clad with vented sheeting. There is no air inlet on the eastern gable end and the calf house does not share air space with the adjacent round-roofed shed, which is a cubicle house. A concrete wall and metal cladding ensure no air from the cubicle house drifts into the calf air space. The air outlet is via a raised ridge cap at the apex of the roof space. One would think that there should be more inlet area but the atmosphere inside the house was fresh on the day we were there and Garry has had no problems with pneumonia in the shed. The calves seem to lie randomly in the pen as well which is a good sign that there are no draughts at calf level right throughout the pen. There is no skimping on straw usage as can be seen in the photos. In the photos the calves look very comfortable as they nestle in their dry straw bed.

Costs

The costs based on the TAMS 2 reference costs amount to €35,700 excluding VAT. There is room for about 100 calves in the house between group and individual pens. Therefore the cost per calf is about €357. The cost per square metre of internal area is €166 per calf. These costs do not include the automatic calf feeder and associated water, electricity and drainage costs. The individual pens and the space they take up are not fully accounted for either. Including these extra costs, and costing the shed based on the drawings shown, would push up the costs to about €41,400, €414 per calf and €193 per m². The cost of the automatic feeder is not included in this.

DAFM specifications

Refer to S100, S101, S102, S123, S129 and S124 the "Minimum Specification for Calf Housing".

The articles on calf housing were provided courtesy of the Irish Farmers Journal

FUTURE BREEDING OPTIONS



One of the greatest challenges facing the Irish dairy industry is to ensure its breeding policy delivers calves to the beef sector that are more saleable and more profitable at slaughter. The challenge is currently greater than ever, due to beef prices, beef demand and Brexit-related market complexities. Breeding policy must ensure calves not required as dairy herd replacements have a purposeful, productive and economically sustainable life.

There are a number of focal points within breeding policy that can help deliver the required result. One starting point is the beef merit of the dairy cow. Albeit the cow's first objective is to efficiently produce milk solids, produce a calf every 12 months and have genetic and functional traits that support longevity. Having reasonable conformation will contribute positively to producing acceptable offspring for the beef market.

Whilst the genetic and breeding history will vary from farm to farm, there are tools and technologies available that will help achieve the required outcome. These include the Dairy Beef Index (DBI) and sexed semen.

Dairy Beef Index

The Dairy Beef Index is a breeding index for Irish dairy and beef farmers to promote the selection of sires that will help deliver a higher quality beef calf from the dairy herd which will be more profitable at slaughter. Dairy farmers can select sires with minimal consequences on the calving difficulty or gestation length.

In summary it is a composite index, consisting of Calving traits and Beef Value traits. It is imperative to select sires with a significantly positive Beef Value. The Index is expressed in Euros with each €1 increase representing the expected value increase of that animal versus the average.

Glanbia Ireland recommends that farmers would use sires for the production of calves destined for beef with at least €25 for the Beef Value component and with no negative economic value for calving. Beyond that there is scope for trade-offs. With mature and older cows there may be potential to choose bulls with a very high Beef Value but carrying a small cost on the calving traits. In general, the younger cows should have higher EBI's and be the source of replacements. It is strongly advised to consider calving difficulty reliability to avoid surprises.

The DBI ranks beef bulls, for use in the dairy herd, according to their genetic merit for calving and carcase performance traits.

Selection of sires on calving traits alone may increase profitability inside the dairy farm gate but may transfer negative value to the rearer.



Calving
- Gestation length
- Calving difficulty %
- Calving difficulty reliability %

Beef Value
- Carcase weight
- Carcase conformation
- Out of spec

+ DBI

Sexed semen

Sexed semen is potentially a revolutionary technology for dairy farming. Glanbia Ireland and other interested parties co-funded a 2018 sexed semen research trial on the latest technology. Glanbia Ireland will continue to work with industry partners - including Teagasc, ICBF and the AI companies - to ensure the research is fully up-to-date and progress is made on this issue.

Conception rates were variable in the trials conducted in Spring 2019.

Conception rates with conventional semen averaged 59.9% and 45.5% with sex sorted semen (a relative conception rate (RCR) of 76%).

One third of participating herds had a RCR of 100%, one third had a RCR of 84% but the bottom one third had a RCR of 67%.

Timing of AI, semen handling, individual bull effects are all factors that require further work.

If further progress can be made with sexed semen, it could become a useful tool in breeding the required number of replacement heifers and allow optimisation of the economic value and potential of those destined for beef production.

Breeding recommendations

The use of high EBI dairy bulls, has delivered significant profit increases per cow through increased fertility and milk solids output. The fertility gain has also driven a more compact calving pattern with a very high percentage of calves born in a 4-6 week period. This does create a market challenge due to the number of calves born over a short period, however, the compact calving period delivers many benefits including maximising the milk output from grazed grass.

Herd owners are advised to ensure that calf accommodation and rearing facilities are aligned with the breeding practice used on the farm. Taking steps to maximise the beef potential of the calves coming off the dairy herd will also create market opportunities.

Taking all the considerations into account we suggest the following as the most holistic approach to breeding.

- Continue to use high EBI bulls to breed replacements.
- The younger cows and heifers normally have the highest EBI's and should be the target for breeding replacements.
- Plan breeding to produce the appropriate number of replacements for the farm.
- Maximise the use of beef crossing to increase calf value, especially from the more mature (probably lower EBI) cows.
- Use the DBI index to select bulls to best match your herd to:
  - Minimize the impact on calving, especially in heifers.
  - Optimise the opportunity to increase beef value, taking cognisance of carcase weight and grade implications.
- Monitor sexed semen developments and consider its merits on your farm.



Twenty20™ BEEF CLUB

FARMING

TOGETHER FOR A SUSTAINABLE FUTURE

The Twenty20 Beef Club is an integrated calf-to-beef Programme between Glanbia Ireland (GI), Kepak Group and their respective farmer suppliers. It has been created to sustainably produce and market Irish heifer and steer beef. A fully traceable input supply chain will underpin the Programme (closed loop) and support the establishment of industry leading marketing claims.

The overriding objective of the Programme is to improve the economic, environmental and social sustainability of calf-to-beef production in ROI for dairy and beef farmers with all calves from dairy dams in the Club emanating from the Glanbia Dairy Herd.

Additional value will be created by sustainably producing beef, with complete traceability and transparency through:

- Genetics and Agri Technologies
- Animal Health and Welfare
- Nutrition & Grassland management
- Transparent Pricing , Premiums and Bonuses
- Advance Payment Package (optional)

Today's consumers increasingly seek a better understanding of where their food comes from. Topics such as their personal health, the health/welfare of animals (in the food chain) and their impact on the environment occupy their minds and drive their purchase decisions. Consumers want to enjoy what they eat and feel good about it.

Summary of benefits

For dairy farmers:

- A ready-made market for 50,000+ calves (by year 3).
- Breeding policy designed to improve calf saleability and slaughter value.
- Increased value of calves reared for beef.
- Reduced welfare pressure in spring (where compact calving is practiced).

For beef farmers:

- Calves sourced directly from approved suppliers using the known quality genetics and following welfare, health and nutrition guidelines.
- Transparent Pricing Model with 2 year visibility.
- A Market Plus Club Premium that is supported by the market, the processor and the closed loop. The premium is higher when low market prices prevail.
- Quality Protocol Premium – on all stock meeting the carcase weight (guaranteed for 2 years).
- A Production Blueprint to reduce costs and optimise lifetime performance underpinned by health, welfare and nutrition protocols and supported by our technical staff.
- An Advance Payment Option.

For the consumer:

- A closed loop production system – delivering total traceability and provenance.
- A preventive approach to animal health, reducing antibiotic requirements.
- Production protocols covering nutrition, health, welfare – to deliver a significant reduction in carbon foot print.
- A nutritious product with consistent eating experience.



Club eligibility criteria

Eligibility for Club membership is open to dairy and beef farmers who are willing to commit to the Club protocols.

- Members must be Glanbia Co-op members (ROI) or Kepak suppliers.
- Calves must be finished on the farm of birth (Glanbia farmers) or after one movement to a finishing farm (can be moved as calves or stores).
- Minimum number of animals is 25. No maximum applies.
- All mainstream animal breeds are eligible with the exception of Jersey and Jersey crosses.
- Members will have contractual obligations as will Kepak and Glanbia Ireland.
- Dairy beef calves must be born on the farms of Glanbia Co-op members participating in the Club.

Club requirements

- All eligible calves must have a known sire recorded on the AIMS registration system (from 2020)
- Stock bulls used in the herd of origin must be pedigree registered and genotyped.
- A minimum of 10% of the calves entering the programme must be genotyped to verify breed and parentage. These will be randomly selected by the Club administrators and carried out by the Club Member.
- Dairy farmer Members will be required to select bulls with a specified minimum ICBF Dairy Beef Index. The list will be published and communicated to members annually.
- In the case of the Holstein and Friesian sires, selection will be based on the beef sub index within ICBF's Economic Breeding Index.
- All Members must be approved and fully compliant with Bord Bia's Sustainable Beef & Lamb Assurance Scheme (SBLAS) and as such verified members of Origin Green.
- All inputs (feed/micronutrients, fertiliser and non-prescription animal health products) must be sourced and supplied by Glanbia Ireland (refer to protocols).
- Where home-grown feeds are used, any purchased and/or balancing ingredients must be approved and supplied by Glanbia Ireland (refer to protocols). The GI Technical team will prepare, supply and record the diet formulations in use.
- All Members must complete the "Data Release Consent Form" with their expression of interest form. Admission to the Club is at the sole discretion of Glanbia Ireland and Kepak.

The benefits of membership

The Twenty20 Beef Club initiative will help support the reputation of the Irish livestock industry by improving the quality and value of beef calves emanating from the dairy herd, by reducing calf mortality and securing customer loyalty on the back of unique product attributes.

The benefits culminate in rewarding the producer through:

- **A Club Premium of 15c – 25c/Kg (the range is market dependant)**
- **Quality Compliance Bonus: 12c – 20c/Kg (depending on grade for animals in a carcase weight range of 280 Kgs to 360 Kgs)**
- **A Breed Bonus where applicable of 10c/Kg and**
- **A Seasonality Bonus: April and June – 6c/Kg, May – 10c/Kg**

In the current market (Oct 2019) the Club pricing structure is worth circa €0.40/Kg more than similar cattle priced outside of the Club.



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