TEAGASC/ANIMAL HEALTH IRELAND

CALFCARE OPEN DAYS

TODAY'S CALVES, TOMORROW'S HERD

– how to maximise calf health for long term profitability

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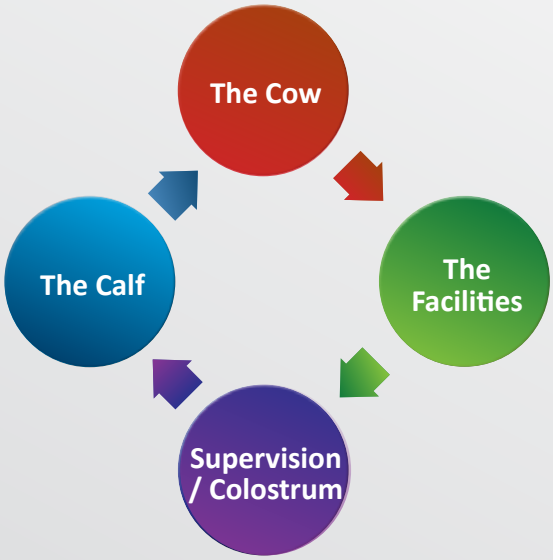
LABOUR EFFICIENT CALVING AND CALF MANAGEMENT

With the increase in the size of the national herd and improving fertility, a greater proportion of calves are born on farms in a concentrated period of time. Four core areas around efficient calving and calf management are outlined below:



THE COW

Aspects of pre-calving cow management critical to success are:

- Body condition score of the cow is on target (3.25) at calving. Over-fat cows have a greater risk of increased calving difficulty. Restrict the quantity of high quality feed to cows that are over-fat prior to calving. Supplement the diet of thin cows with concentrates to improve their condition prior to calving. There is still time to influence the condition score of cows calving from late February at this stage.
- The following table is a useful guide to recommended silage allowance and supplementation rates for cows for an 8-week dry period.

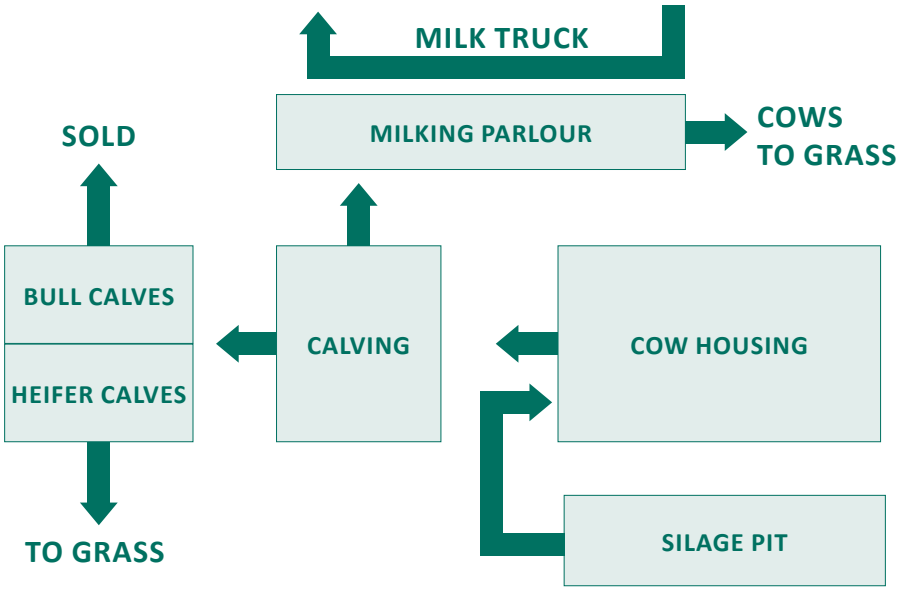
Silage DMD (UFL)	BCS AT DRYING OFF			
	<2.5	2.5	2.75	3.0+
>72 (0.81)	Silage 1kg conc	Silage	Restrict Silage	Restrict Silage
68-72 (0.78)	Silage 2kg conc	Silage 1kg conc	Silage	Restrict Silage
<68 (0.76)	Silage 3kg conc	Silage 2kg conc	Silage 1kg conc	Silage

- Where carried out, vaccination for scours should take place at the correct time prior to calving.
- The calving difficulty of the bulls used is an important guide to the likely ease or difficulty of the calves born. Target direct calving difficulty percentages of less than 2% (with a reliability of >90%) for first time calvers.

THE FACILITIES

Prepare an adequate calving area. A 100 cow herd with 90% six week calving rate will have a median calving date 15/16 days after the start of calving. This is 50 calvings in 15 days, which equates to an average of four calvings / day. The number of spaces required is then determined by how frequently cows are drafted out and how long they spend in the calving area. The recommended area available for cows in calving areas is 10m2/head (both lying and feeding area). An allowance of 15 places is the minimum recommended for such a calving profile or the equivalent of 150 m^2 for the herd.

- Group calving pens are useful for larger herds:
  - They are easier for feeding and cleaning out
  - Can draft out every 2/3 days rather than daily
  - They still require some individual pens and a restraining area
  - If these calving areas are used as winter accommodation, they need to be cleaned and disinfected in advance of calving.
- Camera - has its advantages and disadvantages. It can interfere with a night's sleep.
- Night watch person - for large herds this is an option. Farmer/employee could be the night watchperson, may be easier to get relief worker for the day shift. Also, a night calver could be shared between two farms.
- Each calving area / pen should be serviced with restraining facilities.
- Having an efficient farm layout is becoming more and more crucial as herd size increases and calving becomes more compact. The following figure presents an efficient farm layout for an ideal flow of cows and calves around the farmyard during the calving season.



SUPERVISION / COLOSTRUM

- It is easier to supervise calving with a reduced rate of night time calving. Once calves are born, they should be removed from the calving area and the navel disinfected immediately. The calf should be fed 3 litres of its own dams colostrum as soon as possible and tagged. Teat feeding is recommended because it helps to train the calf to artificial teats for the second and subsequent feeds.
- Night time feeding is recommended as it reduces the rate of night time calving (from approximately 25% to 15%). This needs to begin approximately 3 weeks before the cows are due. In a compactly calved herd half the herd will commence night-time feeding from early January and while cows are housed in the calving area prior to calving.

Practical guidelines

- Need adequate silage feeding space (0.6 metres per cow)
- Put silage at feed barrier during the day (avoids machinery work at night)
    - Use fence wire to keep cows back from this silage, lift fence at designated time in the evening
    - Alternatively, have feed barrier in the group pen which is lockable

THE CALF

Once a day feeding (OAD) before calves are four weeks old can create health concerns by overloading the abomasum. In a Moorepark experiment, calves fed 15% of their birth weight (6 litres) in milk replacer from 4 weeks of age, either once daily or in two equally divided feeds, did not have an increased likelihood of developing diarrhoea. No differences in calf performance or health were observed between calves fed once or twice a day. This provides valuable information to farmers as it means labour input per calf may be reduced by utilizing a once a day feeding regime in the knowledge that it has no unfavourable repercussions on the growth and health of calves. However, if feeding milk once a day calves still need to be checked thoroughly twice a day.

Overall 36% savings in total calf care time could be achieved if calves were fed milk once daily.

In a survey of 1,000 farmers participating in discussion groups, only 27% are practicing OAD feeding of calves. Average turnout date of calves in groups is April 11th. There is potential to reduce the labour associated calf rearing by adopting OAD feeding and earlier turnout to grass.

Experiments at Moorepark determined that calves turned out at 4-5 weeks old could be reared without compromising weight gain and vitality compared to calves reared indoors during the milk feeding period. However, it was deemed necessary to provide overhead shelter from wind and rain for all calves outdoors. Three housing systems were compared at Moorepark:

i) indoors in conventional housing

ii) outdoors with low cost roofed shelters

iii) outdoors with straw bale shelters in a cross or 'X' shape.

Calves went to grass at approximately 3 weeks old – if however, calves became ill or were showing signs of ill-thrift outdoors they were brought back in and treated, they were returned outdoors post recovery. Daily weight gain from birth to weaning was higher for the group of calves reared outdoors (0.54 kg/calf/day) compared to those reared indoors (0.48 kg/calf/day). Interestingly, it was clear from this experiment that pre-weaning treatment affected post-weaning weight gain: weight of the outdoor reared calves tended to be higher (+9 kg) 72 days after mean weaning date.

Practical guidelines for outdoor rearing:

- Use a sheltered paddock near farmyard.
- Field must be dry.
- Turnout calves on dry, preferably sunny days.
- Provide a temporary shelter, ideally portable. E.g. pallets with a simple roof, straw bales or a purpose built shelter.
- Have a suitable method of feeding calves and transporting feed to the paddock.
- Provide a trough for concentrate and fresh water at all times.
- Try not to use the same field each year to minimise parasite build-up.
- Ideally give calves a new section of grass every 4/5 days – preferably grass covers less than 900 kg DM/ha.
- Create a second group for younger calves to ensure they get sufficient milk and there is no mixing of young and old calves.

DISINFECTION PROTOCOLS FOR CALF REARING

SUMMARY

Before the calving season

- Have calving facility cleaned out and disinfected before the start of the calving season.
- Don't use the clean calving facility for abortions/premature calvings or sick animals.
- Calving facilities that can be mechanically cleaned out reduce labour at the busiest time of the year.

During the calving season

- If using calving boxes, regularly clean out/ disinfect/re-bed before the bedding becomes moderately contaminated.
- If using a loose pen, remove soiled bedding/ disinfect/re-bed before it becomes moderately contaminated.
- Choose a disinfectant in conjunction with your local vet or advisor.
- Cleaning & disinfection involves a clean/ wash/dry cycle followed by a disinfect/dry cycle.

INTRODUCTION

Cows can transmit pathogens in their faeces, urine, birth fluids, afterbirth, calf and colostrum/milk around calving. These pathogens can survive for days, months or years in the environment. The calving environment includes animals, afterbirths, bedding, surfaces, fittings and equipment. Survival of pathogens is increased in the presence of organic matter such as faeces-contaminated bedding. Hence, contaminated bedding is an important source of infection transmission around calving.

Around calving both the cow and her calf have poor immunity. Hence, if they pick up infections, from their environment, they are more likely to become ill. Clipping cows' udders and tail pre-calving, to reduce faecal and urine contamination, may reduce the risk of infection transmission to her calf. The longer the cow and the calf spend in the calving unit the greater the risk of picking up infections. Farm personnel and scavenging animals (e.g. dogs, vermin) can also pick up infections from the calving environment, especially from afterbirths, birth fluids and dead calves.

Important infections which are transmitted around calving include Johne's disease, leptospirosis, salmonellosis, neosporosis and mastitis, scour and navel-ill-causing pathogens. Disinfection protocols can reduce these infectious risks.

PERSONAL PROTECTION

Disinfectants can irritate skin and eyes and stain and corrode hence, observe precautionary measures. Wear washable clothing and use personal protective equipment (PPE, e.g. mask, goggles, gloves, gown) when handling, mixing and applying disinfectants. Reduce hose pressure to reduce spray bounce-back and aerosolisation. Wash hands after work. Both infectious agents in the calving facility and the disinfectants used to reduce them can be harmful to farm personnel.

CHOICE OF DISINFECTANT

Disinfectants are products designed to kill pathogens on surfaces or in the air in the animals' environment. Antiseptics are disinfectants used to kill pathogens on animals or on equipment which has direct contact with animals, e.g. buckets. Discuss disinfectant choice with your local vet or advisor. Disinfectants approved for use against TB and other notifiable diseases are listed in the Department of Agriculture list (https://www.agriculture.gov.ie/media/migration/animalhealthwelfare/diseasecontrols/disinfectants/ApprovedDisinfectant261017.pdf). Disinfectants effective against other common infections are also available. Where cryptosporidiosis or coccidiosis is a problem, CoxyCrypt® , Cyclex®, Interkokask®, Kenocox®, Neopredisan® or Ox-Virin® can be used. Some disinfectants are not suitable for use in the presence of organic matter (e.g. bedding). Disinfectants differ in the dilution rate, types of pathogens

they kill and the contact time required, typically a few hours. Some disinfectants need to be applied to a dry surface. While most disinfectants are liquids, powder disinfectants are also available. The latter can be used on bedding and in the presence of livestock.

DISINFECTION PROTOCOLS

Calving facilities should be regularly cleaned out/disinfected/re-bedded before the bedding becomes moderately contaminated. The most important parts of this protocol are the removal of bedding, feed, and cleaning of surfaces (walls up to about 1.5m) and fittings (gates, drinkers).

Cleaning & disinfection (C&D) involves a clean/wash/dry cycle followed by a disinfect/dry cycle.

Moderate-pressure power washing, (hot water/steam cleaning for some disinfectants and detergent), facilitates removal of dried-in, compacted biofilm contamination. However, do not use power washers if other cattle are in the same shed or in a nearby pen, as the pressure from the washer will spread the contamination into the air where it can be inhaled by nearby cattle.

The frequency of disinfection will depend on the number of calvings and the condition of the bedding. Bark chip pads need regular cleaning to maintain surface hygiene for calving cows and their calves. Place, use and maintain a boot-washer/footbath at the entrance to the calving facility.

Disinfectants can be applied through a low-pressure power washer (e.g. empty calving box) or knapsack sprayer (e.g. occupied, loose calving pen); these may need to be rinsed out after use. Smooth, steel-trowel finished surfaces are easier to disinfect; fittings and wooden surfaces may require saturation/specific disinfectant/s. Consult your local vet about best practice in relation to routine and disease outbreak (e.g. salmonella) disinfection protocols.

CALVING BOX

Start by removing all bedding and dispose of it in a dungstead where it will compost. Clean surfaces and fittings with a pressure washer. Leave surfaces to dry, as necessary. Apply disinfectant. Leave to dry, as per manufacturer's instructions. Re-bed pen

LOOSE PEN

Remove soiled bedding and dispose of it in a dungstead. Apply disinfectant, suitable for use on bedding to the area and re-bed.

CALVING EQUIPMENT

Calving equipment (e.g. buckets, calving jack and ropes, stomach tube, nose tongs and PPE) should also be washed thoroughly with detergent and then disinfected immediately after use to avoid build-up of contamination (e.g. colostrum, birth fluid, blood and faecal deposits). Separate equipment should be used for newborn animals, and sick calves, e.g. buckets, stomach tube. Antiseptics for use on animals may be more suitable than surface disinfectants, depending on the equipment. Calving equipment should be washed thoroughly in warm water antiseptic, scrubbed clean, rinsed in warm water and left to dry before reuse.

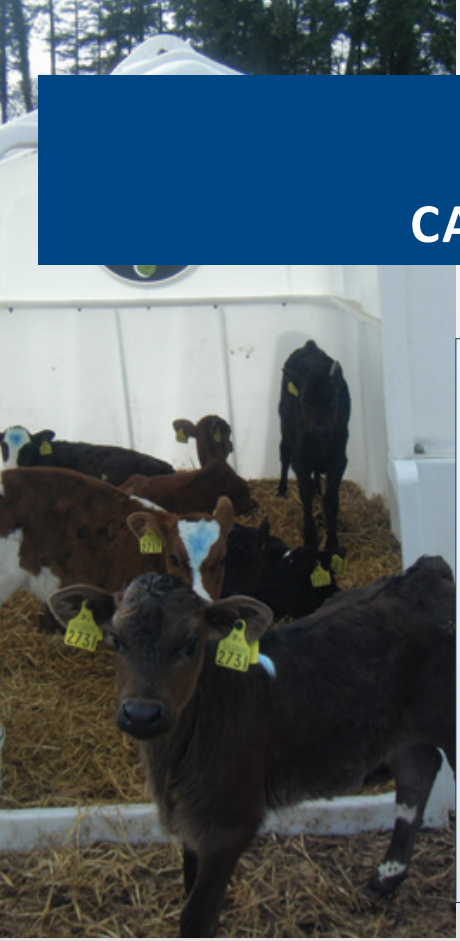
DISPOSAL OF AFTERBIRTHS

Afterbirths should be disposed of through a knackery. If they are held for a period on farm, this could be done using a sealed container such as a wheelie bin. Addition of lime should be considered. Animals should not have access to afterbirths. For instance, if Neospora is a problem ensure dogs cannot access the afterbirth after disposal.

TERMINAL DISINFECTION

At the end of the calving season, remove all bedding and disinfect all surfaces, equipment and fittings. The longer the dry rest period the better given that some pathogens can survive for months in the environment.

CALF HOUSING

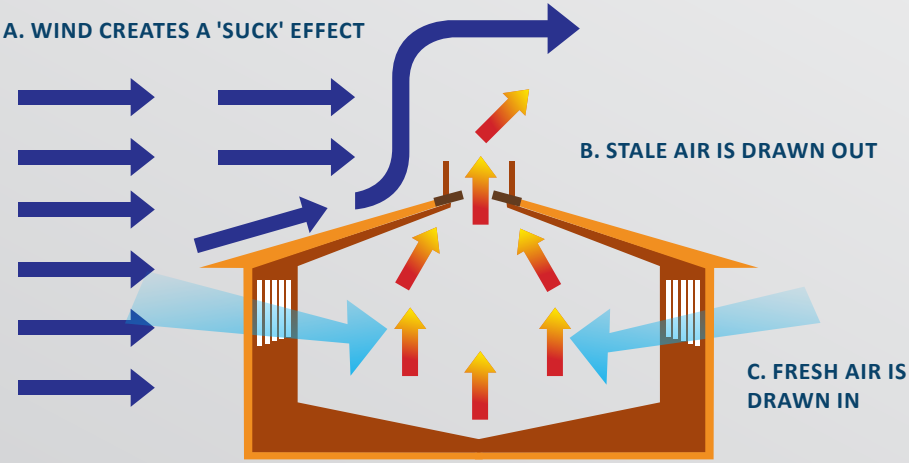


To ensure that calves stay healthy and perform well they require;

- Adequate colostrum, milk feeding and appropriate meal and roughage with fresh water
- Control of pathogens (bugs) with good hygiene, disinfection and vaccination
- An appropriate environment/calf shed.

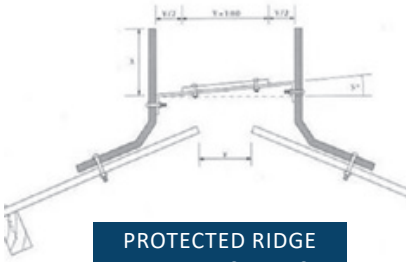
There are 5 key requirements for a calf shed

1. Fresh air
2. No draughts
3. Dry/good drainage
4. Warm – temperature
5. Clean and cleanable.



1. FRESH AIR

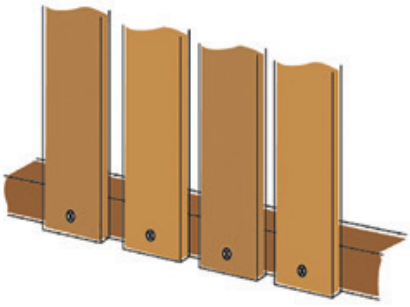
- Sweeps out the dust / ammonia & bugs.
- A biocide – viruses will survive for a shorter period of time in fresh air than in stale air.
- Need an outlet and an inlet
  - The outlet is 0.04m^2/calf e.g. 2m^2 for 50 calves
  - The inlet is two to four times the area of the outlet e.g. 2-4m^2 for 50 calves on two sides of a calf shed.



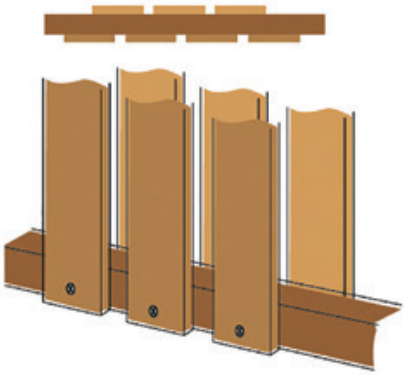
PROTECTED RIDGE WITH UP STANDS

- Keep dust to a minimum – rolling out bales of straw is more effective than shaking up straw at keeping the dust load down. Do not use a straw blower. Dust creates irritation and makes it easier for bugs to become established in the airways of the calf.
- Yorkshire boarding is preferable to space boarding or vented sheeting. It provides draught free air into the shed without allowing in the rain. As it is made from wood it provides more insulation than tin, so helping to keep calves warm.

SPACE BOARDING
3" OR 4" BOARDS
WITH A 1" GAP



YORKSHIRE BOARDING
6" BOARDS WITH A 2" GAP
2 ROWS SEPARATED BY 2"



2. DRAUGHTS

- A draught is a flow of air of greater than 0.5m/second that gets in below the animals height.
- Calf sheds should be sealed to 4 feet (1.2m) in height to prevent draughts from occurring.
- Need fresh air but must control the speed at which it enters the house.

3. DRY/GOOD DRAINAGE

- Moisture must be controlled for two reasons because it:
  - Increases survival and spread of bugs
  - Decreases the temperature in the calf house e.g. a damp room vs a dry room.
- When the calves are in residence, don't wash down calf house floors – or utensils such as buckets in the calf house itself.
- Good design and drainage of the calf pens is essential to keep the beds dry (a floor slope of 1:20 is recommended) and ensure they don't need to be washed down to keep them clean.

4. TEMPERATURE

- Calves perform best at 15-20 Centigrade but don't generate sufficient heat to insulate themselves from colder temperatures until their rumen is fully developed. This happens sometime after they are weaned off milk onto a solid diet.
- Deep beds of straw are an effective way of protecting the young calf from the cold. They should be able to 'nest' so that their legs are covered by straw when lying down.
- Breathable washable calf jackets are useful for a dry new born calf up to one month of age- from then on they're starting to generate more of their own heat as the rumen starts to develop.

5. CLEAN AND CLEANABLE

- When calves are in the shed, the use of water should be kept to a minimum. Easily cleaned floors and walls are important to remove bugs from the building.
- When the shed is emptied, deep cleaning with power washers, steam cleaners and appropriate disinfectants should be carried out as soon as possible afterwards. Once cleaned out and disinfected a long rest period is an effective means of ensuring that bugs are eliminated from the calf house.

GENERAL DESIGN CONSIDERATIONS

- Ideally a calf shed should be situated upwind of all the other cattle sheds and should be built with the side walls perpendicular to the prevailing wind.
- A calf house should not share an air space with older animals. Ideally no more than 60 calves in the same air space and smaller group sizes (8-12) in each pen are easier to manage.
- Calves up to 100kg require a pen area of at least 1.67m^2 each, better performance and less disease is associated with 2-2.5m^2 per calf.
- Long narrow houses are easier to ventilate than wide square houses. The width of a house should not be greater than 11m.
- The pitch of the roof should be at least 23^o, to give a difference of 1.5-2.5m difference in the height of the outlet and the height of the inlets.
- Upstands, as shown above, are preferable to cowls over a ridge outlet. Cowls can lead to a down draught in certain wind conditions.
- To allow good drainage the slope of the floor should be 1:20 and it should be smooth so that water does not pool but drains away freely. Areas of wet concrete should be kept to a minimum as these greatly reduce the temperature in the shed.
- Buckets should be washed after each use and feeders should be washed at least 2 times per day.
- A dedicated area protected from faecal contamination and away from adult animals and through traffic should be used for washing equipment. Ideally, this would be located outside the calf shed or in another shed.

JOHNE'S DISEASE AND THE NEWBORN CALF

ABOUT JOHNE'S DISEASE?

Johne's disease is a bacterial disease of cattle and other ruminants for which there is no cure. It is caused by the bacterium Mycobacterium avium subspecies paratuberculosis (MAP), hence the other name for the disease- Paratuberculosis. The signs of infection appear very gradually in an animal and typically include:

- Reduced production - lower milk yields and lower feed conversion efficiency
- Weight-loss despite a good appetite
- Scour (not bloody) and ultimately emaciation
- Soft swelling of the jaw (bottle jaw) or brisket
- Death.

Signs increase with time since infection, becoming more obvious as an infected animal ages. Once infected, the disease progresses slowly in an animal and spreads within the herd as a result of shedding of bacteria in the dung. The signs of disease and time of onset in any one animal will vary depending upon the stage of infection, how many bacteria were swallowed when it was a calf, how soon after birth this happened and how quickly the gut wall became damaged.

Cattle usually become infected as calves early in life by drinking or eating milk or food contaminated with the bacteria, which are shed in the dung or milk of infected adult cattle. On occasion, calves are already infected at birth, with this being most common when their dam has advanced disease. Sometimes one infected calf can infect pen-mates early in life as a result of bacteria in the colostrum or milk it drank 'passing through' and contaminating the calves' environment.

Some animals have a sub-clinical infection with no obvious signs of disease, but these animals also will have reduced production, demonstrated in reduced fertility, reduced slaughter weight and value, reduced milk quality and increased susceptibility to other diseases before the obvious signs occur.

HOW DOES INFECTION OCCUR?

Animals are infected by the 'faecal oral route' and are most likely to become infected if they swallow MAP bacteria when they are very young. Even a very small amount of dung, e.g. on a dirty udder, can contain enough bacteria to infect a suckling calf. The mode of disease transmission presents farmers with both management challenges as well as opportunities to break the cycle of spread for Johne's disease very early in a calf's life and prevent the progression of Johne's disease within a herd (Figure 1).

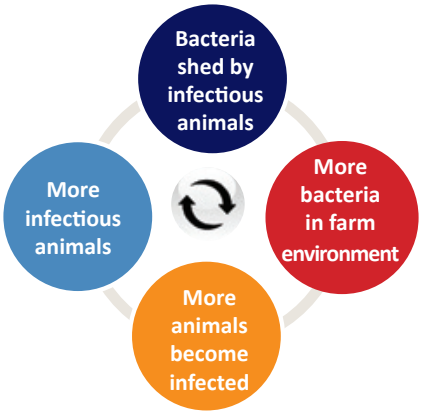


Figure 1. Johne's disease progression within a herd.

Farm management decisions made in the first six months of a calf's life have the potential to determine the health outcomes for that animal and more importantly assist or hamper on-farm Johne's disease control efforts.

PREVENTION OF INFECTION IN THE YOUNG CALF

Calves are the most susceptible animals on a farm but by around 6- 12 months of age are less susceptible to infection. By focussing on a few simple calf management practices farmers can effectively reduce the risk of infection using practices which are also aids to improving general calf health.

1. REMOVE CALF AS SOON AS POSSIBLE FROM THE CALVING PEN

The early removal of a calf from the calving pen, reduces exposure to dung in the bedding and from direct exposure to a potentially infected cow. The reduced time in the pen also reduces the risk of calves attempting to suckle from a cow with a dirty udder or teats. Ensure calving cows are clean and the calving environment is free from dung. The calving pens should be frequently and thoroughly cleaned. As a minimum, sufficient fresh bedding should be put down such that the pen floor is dry and clean between each calving.

2. CLEAN COLOSTRUM COLLECTION

Make sure the cow's udder is clean before collecting a cow's colostrum and that your own hands have been washed and the containers used to hold the harvested colostrum and any feeding buckets or tubes are clean and are also carefully washed between each use. Your own work clothing may have dung on it which can also contaminate colostrum after collection.

3. FEED COLOSTRUM AND MILK FROM TEST NEGATIVE COWS

As a general practice it is best to feed colostrum and milk from cows that have tested negative as part of whole herd test. Milk from test-positive cows presents an increased risk to calves for a number of reasons. If dung from these animals accidentally contaminates buckets, calves have a much greater exposure to infection. Even just collecting colostrum or milk from such animals increases the risk from an aerosol spread of infection and in some instances test-positive cows may be secreting bacteria directly into colostrum and milk and this also presents an additional risk to calves. It is strongly recommended that the use of pooled milk is avoided since this is a major risk to calves becoming infected by Johne's disease.

OTHER CONTROL MEASURES

Breaking the infection cycle through careful calf management and attention to cleanliness in the calf' environment is only part of effective JD control.

- Farmers should also carefully consider the need to introduce animals to minimise the risk of introducing the disease into a herd through a sub-clinical animal.
- By removing any clinical or confirmed test-positive animals as soon as possible after they are identified, farmers are able to reduce the level of contamination in the herd. These animals are responsible for the ongoing contamination of pasture, sheds and milk.
- The bacterial load in dung can be reduced by identifying infected cows through whole herd testing of blood or milk, followed by confirmatory testing of dung samples. These infected animals should be isolated and managed separately before they leave the farm to reduce risk of infection spreading to young stock and general contamination of the environment.

To control Johne's disease infection or prevent its introduction to your farm it is advisable to follow the recommendations of the Irish Johne's Control Programme, details of which can be found on the AHI website www.animalhealthireland.ie.

KEY POINTS

Johne's disease is caused by a bacterial disease for which there is no cure. The disease spreads between farms and within herds by means of carrier animals. New-born calves are the most susceptible animals on a farm and careful attention to dairy hygiene and the use of colostrum from test-negative animals is an important and effective way of reducing the spread of infection within a herd.

SELECTING BEEF AI SIRES FOR THE DAIRY HERD

SUMMARY

- Beef bulls are crossed with the dairy herd to increase calf value.
- The use of beef genetics on the dairy herd is increasing each year.
- Angus, Hereford and Limousin are the most popular beef breeds.
- Choosing a beef bull based on its terminal traits is important to increase calf value for the dairy farmer and profit for the beef farmer.

INTRODUCTION

The dairy beef sector in Ireland is an important and growing industry. The national dairy herd will have increased by an estimated ½ million cows between 2010 and 2018. With it has come an increase in the number of dairy calves available for beef production. The use of breeding tools, such as the EBI, has increased the fertility of Irish dairy herds. Consequently, fewer cows need to be bred to dairy bulls to produce heifer replacements in the coming years. This will allow dairy farmers to use more beef genetics in the years ahead. While the contribution of the calf enterprise to dairy farm profit is small, there are opportunities to increase its value and contribution in the years ahead.

CALVES FROM THE DAIRY HERD FOR BEEF PRODUCTION

In 2016, 30% or dairy calves born were replacement heifers (398,000), (AIM, 2016). The remaining calves born (approximately 900,000) were available for beef production. Male dairy calves account for 45% of these dairy beef calves. Early-maturing crossbred male and female calves (of the Aberdeen Angus and Hereford breeds) account for a similar number. The balance of beef breed calves from the dairy herd are made up of a variety of different breeds particularly Limousin.

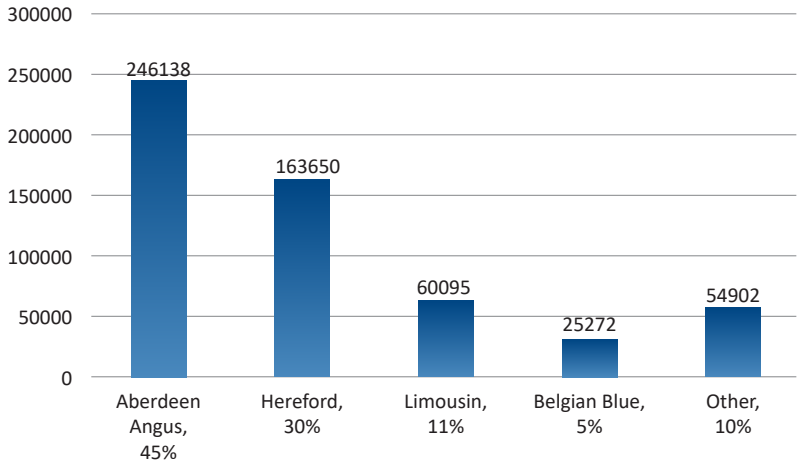


Figure 1. Beef sire selection for dairy dams (AIM, 2016).

CHOOSING THE RIGHT BEEF BULL FOR YOUR DAIRY HERD

The contribution of the calf enterprise to the profit of the dairy farm is generally considered small with beef bull selection on dairy farms is often not considered a high priority. However this is likely to change in the years ahead as the rapid rate of expansion of the dairy herd set to decline and improvements in dairy herd fertility combining to reduce the proportion of dairy breed calves required at farm level. Hence the opportunity to increase the proportion of beef breed calves born on dairy farms and in turn the value of calf sales.

Four key traits are of interest to dairy farmers in selecting beef bulls for their herds:

- Calving ease
- Gestation length
- Calf value
- Carcass weight.

Target when selecting beef bulls for the dairy herd (Heifers):

- Calving ease max 2% (minimum 90% reliability)
- Gestation length max 1.5 days but target bulls with negative figures for gestation length (minimum 70% reliability)
- Carcass weight minimum 6 kg (minimum 70% reliability).

Target when selecting beef bulls for the dairy herd (cows):

- Calving ease max 4% (minimum 90% reliability)
- Gestation length max 1.5 days but target bulls with negative figures for gestation length (minimum 70% reliability)
- Carcass weight minimum 8 kg (minimum 70% reliability).


Arrabawn
Co-op


Aurivo


Centenary Thurles
Co-operative Society Ltd


dairygold
Golden Valleys, Growing Naturally


glanbia


KERRY
AGRIBUSINESS


Lakeland
DAIRIES


TIPPERARY
COOP


teagasc
Agriculture and Food Development Authority


CalfCare
Animal Health Ireland.ie


volac