

Section 7

Significant diseases in beef cattle

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Introduction

Good breeding, calf-rearing, grassland management, winter feeding, housing, biosecurity, etc. are essential to maintaining good health in beef animals. The focus of this chapter is on some specific disease problems that can cause significant loss or concern for beef rearing and fattening enterprises.

- ① How do I deal with diseases causing ill-thrift in cattle at grass?
- ② How do I prevent/manage respiratory disease in housed cattle?
- ③ What are the common causes of sudden death in cattle?
- ④ How can disease affect reproductive performance in cattle?
- ⑤ What are the regulatory controls on specific infectious diseases of cattle?

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1 How do I deal with diseases causing ill-thrift in cattle at grass?

Ill-thrift is failure to maintain condition and bodyweight (adults) or to grow as expected (young stock). The major causes of ill-thrift in cattle at grass are: (1) malnutrition; (2) parasitism and (3) other chronic or long-standing disease

Good grassland management will ensure that cattle have access to plenty of leafy grass that they can readily digest and will provide all of their energy requirements for maintenance and growth. In addition, the diet must also provide small amounts of certain essential chemical elements (trace elements). Deficiencies of any of these micronutrients can result in ill-thrift.

Under Irish farming conditions, copper deficiency is the most common deficiency to affect beef cattle. Rather than a lack of copper in the soil an excess of soil molybdenum, iron or sulphur may be interfering with the uptake of copper. Other less common but significant trace element deficiencies are cobalt deficiency and selenium deficiency.

How to

Recognise copper deficiency.

Ill-thrift, and in severe cases, loss of coat colouration provide circumstantial evidence of deficiency. Your vet's knowledge of the area's copper/molybdenum status will be helpful, and laboratory tests can confirm it

Key risk

Young cattle are most at risk.

What can I do about it?

Copper can be supplemented in a variety of ways (feed, injections, long-acting boluses). However copper poisoning is a real risk, so it should only be supplemented on farms with proven deficiency.

Parasites

The most economically-significant parasitic infestation is that caused by roundworms in the gut. Younger animals are more likely to be affected and severe infestations can result in loss of condition and even death. Climatic and environmental conditions heavily influence the severity of infestations. Infested animals pass worm eggs in their faeces and the larvae that hatch from these infest other cattle as they graze.

Pasture burdens of larvae tend to snowball in the second half of the grazing season and this usually coincides with decreasing grass quality. Spring-born suckler calves are rarely affected by worms in their first grazing season because they don't consume enough grass to accumulate significant burdens, and because the 'dilution effect' of co-grazing with their relatively resistant mothers prevents the build up of dangerous levels of pasture contamination.

In their second year they will usually benefit from immunity acquired from 'trickle infection' acquired in their first grazing season.

Key fact

Autumn-born calves are more susceptible as they are turned out in the spring after weaning with little immunity and are often kept as same-age groups.

How to

Recognise roundworm infestation?

Scour, faecal staining of the hindquarters and tail; affected calves look empty and will lose weight

When/where does it occur? Young cattle

What can I do about it? Appropriate pasture management and the strategic use of anthelmintics

Lungworm infestation causes a parasitic pneumonia or "hoose" and can cause severe disease in suckler calves and weanlings, regardless of when they are born. Hoose should be considered when cattle are seen to be coughing at pasture. This will be exacerbated by exercise, and open-mouth breathing is common.

Laboratory tests (faecal analysis) may be required to differentiate hoose from other respiratory diseases.

Liver fluke infestation can affect all ages of cattle, but like all parasitic diseases, tends to be more severe in younger cattle. This parasite depends on a snail to complete its life cycle and it will be more prevalent on poorly drained land and during wet years. Rumen fluke can cause very severe scour and weight loss in some years on some farms (heavy rainfall, flooded pastures) but, as for many parasitic infestations, infestation is common but disease is rare.

Further information on the control of parasitic diseases may be obtained from the Animal Health Ireland website at www.animalhealthireland.ie

Other chronic diseases

Respiratory disease, which is dealt with in more detail in the next section, may also occur at grass. Many outbreaks are caused by viruses and can be confused with hoose in the early stages (see above). Residual lung damage resulting from respiratory disease in housed calves may continue to affect the performance of young animals after turnout. Other diseases that occur in housed calves in early life and can affect the later performance of beef suckler calves at grass include include navel infections or diarrhoea.

Bovine Virus Diarrhoea (BVD) can cause ill thrift in persistently-infected (PI) calves, which have been infected with the virus before birth, although some PIs show little or no ill effects. This disease is the subject of a national eradication programme being promoted by Animal Health Ireland, and based on testing of newborn calves for the virus. More information on this programme can be obtained at www.animalhealthireland.ie

Johne's Disease is a progressive and insidious disease that can cause scour and weight loss in adult cattle usually over four years of age, and is a difficult disease to control within herds. Laboratory tests for the disease are difficult to interpret; they only give a guide to the herd status, and are not useful for individual animals.

Control programmes are built around preventing infection in early life through management practices that limit the exposure of calves to the faeces of other cattle, and avoiding the purchase of animals that are incubating the disease. Whole-herd individual animal testing as an ancillary aid to early detection of infection. A national voluntary control programme for control of Johne's Disease is being developed by Animal Health Ireland. www.animalhealthireland.ie

2 How do I prevent/manage respiratory disease in housed cattle?

Respiratory disease in housed cattle can be a very significant cause of loss in beef enterprises, particularly in weanlings. There are the obvious costs associated with animals which die of the disease or which require veterinary treatment. However, the hidden costs associated with less severe disease in the remainder of the group (failure to thrive during the illness and subsequent recovery period and the fact that some surviving cattle never fully recover or thrive after the illness) are often of much greater economic significance.

What is respiratory disease and how do I recognise it?

Respiratory disease usually involves the upper airways (the nasal passages and the trachea or windpipe) in which case the signs are nasal discharge and coughing. In some cases the disease extends to the lower airways (the lungs), which by definition is referred to as "pneumonia" and in which cases animals are likely to have difficulty breathing. Animals with respiratory disease are also likely to show general signs of illness such as dullness and a poor appetite.

What causes respiratory disease in groups of cattle?

Respiratory disease in groups of housed cattle is usually associated with viral and/or bacterial infection of the airways. Cattle become infected by inhaling infective droplets produced by other infected cattle. The most significant viral agents are bovine herpesvirus 1 which causes infectious bovine rhinotracheitis (IBR) and bovine respiratory syncytial virus (RSV). Parainfluenza-3 (PI3) virus is less important and Bovine virus diarrhoea virus (BVD) may be involved in some cases.

These viruses can cause disease by themselves or damage the defence mechanisms of the upper airways allowing secondary bacterial infections of the lungs. The most significant bacterial agents are *Mycoplasma* species, *Mannheimia haemolytica*, *Pasteurella multocida* and *Histophilus somni*.

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Key risk



When is respiratory disease most likely to occur?

- After buying-in and mixing of cattle from different sources (*increases the risk of exposure to different infectious agents that cause respiratory disease*)
- Where there is overcrowding and/or poor ventilation (*increases the risk of infection*)
- Where cattle have been subjected to one or more “stress” factors immediately before housing such as weaning, castration, dehorning, transport, etc. (*reduces the animals natural ability to fight off infection and resist disease*)

What to do when it occurs - how is it treated?

There is no specific treatment for viral infections but in the case of an IBR Infectious Bovine Rhinotracheitis outbreak it may be advisable to vaccinate other animals in the group if they are not yet displaying signs of illness. An intranasal vaccine can provide protection within 24-48 hours but this should only be undertaken on veterinary advice and following laboratory confirmation of the diagnosis (this is usually based on testing of nasal swabs collected from affected animals).

Antibiotic treatment may be administered or prescribed by a veterinary practitioner to control secondary bacterial infections.

If possible, coughing calves should be kept separately from unaffected calves and you should consider treatment for hoose if calves were coughing at/before housing.

What practical steps can I take to prevent the occurrence of respiratory disease?

Where cattle are bought-in, follow the biosecurity guidelines detailed elsewhere in this manual – this will reduce the risk of introducing and spreading infectious diseases.

- Ensure that housing is adequately ventilated and drained. The ideal airflow is generated by a pitched roof where spent warm air can escape at the ridge and be replaced by fresh, cool air entering below the eaves - the objective is to provide for adequate air movement at calf head height. A strong smell of urine or slurry in a house or condensation on the underside of the roof are indications that ventilation may need to be improved. Adequate drainage is important to prevent excessive humidity while both drainage and ventilation are important in reducing the exposure of cattle to infective droplets in the air.

- Reduce or eliminate “stress” factors that contribute to the development of disease – (See Section on Managing Weaning in this Beef Manual)
- Consult with your veterinary practitioner about the use of vaccination before housing.

③ What are the common causes of sudden death in cattle?

Finding one or more animals dead which had not previously shown any signs of illness is not an uncommon experience but can be a very distressing one. The herd owner or stockperson will not be at ease until a cause can be identified and the risk to other cattle reduced or eliminated. Here we consider some of the **more common causes of sudden death in cattle** under Irish farming conditions and what steps can be taken to prevent further losses. The list below is not exhaustive and these causes are not ranked in any particular order.

“Blackleg” - *Clostridium chauveoi*

This disease most commonly occurs in young cattle and is caused by infection with the bacterium *Clostridium chauveoi*. An inactive form of the bacterium (spores) present in the environment can be acquired by the animal and can then remain dormant in muscle. Trauma and bruising to muscles, creates the necessary conditions (a reduction in the amount of oxygen) for the bacteria to be activated.

As the bacteria proliferate they produce large amounts of toxin which account for sudden death. The proliferating bacteria produce gas bubbles and discolouration of muscle which may aid a field diagnosis. The disease may be prevented by vaccination.

Other clostridial diseases

Malignant oedema is similar to blackleg, except that the damage to muscle which facilitates the proliferation of the bacteria is usually caused by a wound or injection site and the disease may be caused by any one of a number of different Clostridial species. The disease may be prevented by vaccination.

In Black disease and Bacillary haemaglobinuria (*Clostridium novyii*), the site of bacterial proliferation is the liver where the tissue damage is caused by migrating liver fluke. In addition to vaccination, both of these diseases may be prevented by controlling liver fluke infestation.

Clostridial enterotoxaemias are caused by the proliferation of *Clostridium perfringens* types B or C and the production of toxin in the intestines.

Hypomagnesaemia or “Grass tetany”

A sudden drop in blood levels of magnesium is one of the most common causes of sudden death in adult beef cattle at pasture. It usually occurs in lactating animals in spring and autumn and is associated with decreased availability of magnesium from the diet. Stress factors such as inclement weather conditions are contributing factors.

If found alive, affected cattle show very marked nervous signs; they are hyper-excitable and very rapidly go down in convulsions, whole body tremors and thrashing of limbs. When animals are found dead, one of the hallmarks is disturbance of the ground around the carcass. Urgent veterinary treatment may save some animals.

Prevention: animals at risk should be supplemented with magnesium during risk periods - various methods, including pasture dusting, water supplementation or provision of magnesium licks are available.

Lead poisoning

Lead is one of the most commonly recognised causes of poisoning in cattle and is usually attributed to cattle having access to old car batteries or to lead-based paints. Vehicle sump oil, old vinyl from floor coverings and car seat covers are also potential sources of lead. On rare occasions, catastrophic losses have occurred where discarded batteries have been ensiled and this silage then fed to cattle. Prevention simply requires that cattle are not exposed to potential sources of lead.

Bloat

Gas is produced during the normal digestive processes in the fore-stomachs and cattle belch frequently to discharge this gas and relieve pressure.

Bloat occurs where the stomachs become distended with gas or frothy fluid and can arise in two circumstances:

- (i) where there is an obstruction along the oesophagus or gullet or
- (ii) where there is a rapid fermentation in the stomachs producing a froth which cannot be belched up - this happens in some cases where cattle are grazed on lush clover-rich pastures.

Ruminal acidosis or “Barley poisoning”

If cattle suddenly gain access to and consume large amounts of carbohydrates such as cereal grain or other concentrate feeds, a very rapid fermentation process occurs in the fore-stomachs generating large amounts of lactic acid and producing a type of drunkenness which if sufficiently severe and untreated can be fatal.

Prevention involves gradual introduction of concentrate feeds and providing sufficient trough space.

Electrocution/Lightning strike

This is an occasional cause of sudden death in cattle with few signs of a struggle; occasionally scorch marks may be observed on the carcass. Electrocution (which should be considered where more than one animal is found dead at the same spot) can occur through contact with fallen power lines or with stray electric current in sheds – care should be taken before approaching the carcass(es) to ensure that the source of electrocution is not still live.

White Muscle Disease (Selenium/Vitamin E deficiency)

This is a disease mainly of fast-growing beef calves which can result in sudden death if the heart muscle is affected. Calves may show signs of muscle stiffness before death or are often found dead particularly at the onset of a herd problem. Confirmation of the diagnosis requires laboratory investigation.

Intestinal obstruction or other abdominal crisis

This includes a number of spontaneously occurring conditions such as intestinal torsion (twisted gut), intestinal entrapment, intussusception, abomasal ulceration and peritonitis; such conditions normally only affect one or two animals in a group.

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4 How can disease affect reproductive performance in cattle?

Most infertility in beef herds is associated with the kind of management, nutritional and heat detection issues described in other chapters.

How to Determine how diseases affect reproductive performance?



Infections can have a significant impact on the cow's capacity to produce viable calves, resulting in abortions, stillbirths, or weak calves. This impact can come from infections of the uterus (womb) after calving, preventing the cow from going back in calf, or from a variety of diseases which affect different stages of reproduction. Diseases like BVD may cause early embryonic death or abortion later in pregnancy, other infections can cause foetal death at any stage e.g. *Salmonella Dublin*.

Diseases also differ in the rate of abortion they will cause. Some diseases will cause sporadic abortions (e.g. listeriosis), while other diseases can cause abortion storms, or a large number of abortions together, causing an immediate crisis, e.g. salmonellosis or neosporosis.

What causes abortion?

Any illness where a cow has a very high temperature can result in abortion. Any infectious agents that cross the placenta in the pregnant cow and that cause damage to the foetus and/or the placenta can also result in pregnancy loss. When infection occurs in early pregnancy the resulting embryo loss may only be apparent when cows are found to be "empty".

Illness at later stages of pregnancy can result in the cow throwing the foetus (abortion) or delivering a dead calf (stillbirth). Sometimes there is a delay between the death of the foetus and its delivery such that aborted foetuses and membranes are very often poorly preserved.

Individual or "sporadic" abortions may be caused by an infectious agent (*Arcanobacter pyogenes*, *Bacillus spp.*, fungal agents) or non-infectious attack during pregnancy. Multiple abortions occurring within a relatively short period of time (i.e. an abortion storm) suggest that several cows in the herd have been exposed to an abortion-causing infectious agent.

The list of infectious agents includes:

Brucellosis, which is a very contagious disease causing abortion storms and is scheduled and notifiable. Abortion usually occurs after five months of pregnancy and the placenta and fluids released at calving are highly infectious. The Republic of Ireland is officially brucellosis free but the disease is still present in Northern Ireland. Herdowners are legally obliged to have any cow or heifer which aborts tested twice for brucellosis, this can be an opportunity to take another sample to test for other diseases.

Leptospirosis can cause abortion at any time during pregnancy and is among the main causes of infectious reproductive losses in Irish suckler herds. Tests on the aborted foetus are unsatisfactory and blood testing is preferred to detect exposure. Control involves vaccination in the spring.

Salmonellosis is a contagious disease which can cause abortions from the fourth month of pregnancy. It can also cause other illnesses in the herd. It can be detected by culture from the aborted foetus or placenta, or by blood test. This disease can be difficult to control, as many animals can carry the organism without showing signs. Vaccination of the full herd is recommended if Salmonella infection is confirmed.

Key risk



Brucellosis, leptospirosis and salmonellosis are all diseases which can infect humans. Take steps to avoid infecting yourself or others, seek advice if necessary



Neosporosis in cattle is caused by a parasite acquired from the faeces of infected dogs or foxes, or congenitally from the dam. Abortion normally occurs between three and eight months of pregnancy. Infection from dogs can lead to abortion storms while herds where congenital transmission takes place will normally suffer sporadic abortions.

Infected animals are infected for life and will have a greater chance of aborting, or passing the parasite on to their heifer calves. Neospora can be detected in the foetus or in blood from the cow or heifer. There is no vaccine available here, so control involves restricting the access of pets and wildlife to animal's feed and removing infected animals from the breeding herd. It is not advisable to breed from the female calves of Neospora positive animals.

Silage-associated infections:

Mycotic abortion is caused by a fungus and usually occurs as sporadic abortions between three and seven months of pregnancy. The majority of these infections come from poorly preserved fodder, and much more rarely from bedding. *Listeria* and *Bacillus* are bacteria which are also found in silage, especially where soil has been picked up during harvesting

BVD causes a range of problems, including abortion. Though BVD-related abortion can occur at any stage of pregnancy it is more common in the early stages, while surviving calves may be deformed or persistently infected with BVD (a PI animal).

Tissue tagging of the foetus is a good way to check whether BVD has caused the abortion.

Control involves eliminating PI animals from the herd, as these animals are an overwhelming source of infection – this is the basis of the current AHL eradication programme. Vaccination can give increased protection from the disease **but is not effective if PI animals are left in the herd**, especially if left in contact with breeding stock.

IBR / Bovine herpesvirus-1 can cause abortion. It may be transmitted by the semen of infected bulls. As infection is much more common than disease, it is difficult to interpret blood tests.

Q fever (*Coxiella burnetti*) is caused by a bacteria-like organism (*Coxiella burnetti*) that most readily affects sheep and goats, causing abortion. It may transfer and cause abortion in cattle. It also affects humans.

Key question

Does abortion affect the cow?

Aborting cows do not normally display signs of illness unless there is retention of the foetal membranes (afterbirth) and uterine infection; salmonellosis is an exception where many of the aborting animals may be ill.

How to

Deal with the aborting cow

- Quarantine the aborting cow from other cattle, especially from other pregnant cows for 2-3 weeks until vaginal discharge has ceased.
- Submit specimens to the laboratory - blood from the cow for brucellosis and for salmonellosis, leptospirosis and neosporosis; the foetus and afterbirth for post mortem examination and culture.
- Hygienic precautions should be taken, especially handling the products of abortion and any discharge from aborting cows, as most of the infectious diseases which cause abortion in cattle can also cause severe illness in exposed persons.
- Hygienic disposal of contaminated material; thorough cleaning and disinfection
- Closely monitor other pregnant cows to ensure that this is not an "abortion storm"

Note that there is a legal requirement (legislation for control of brucellosis) on the owner or person-in-charge to isolate an animal that aborts and to either notify the Department of Agriculture or send specimens for laboratory diagnosis.

How to

Prevent re-occurrence of abortion storm in future years

Vaccinate cows where there is a definite diagnosis of salmonellosis or leptospirosis

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Key question



How do I deal with retained placentas and womb infections after calving?

Infection of the uterus after calving, known as endometritis or metritis, may lead to severe illness, or mild disease which goes unnoticed but impairs fertility by making the womb unsuitable for the embryo to implant often results.

- Prevent infection at calving by ensuring good hygiene of calving facilities and equipment.
- Check high risk cows (twins, difficult calving, etc.) after calving. Infection may be detected by a discharge from the vulva, on handling or by ultrasound scanning.
- Veterinary attention should be sought as these infections are difficult to cure. Retained foetal membranes, where the placenta is still attached to the uterus after 24 hours, will greatly increase the chance of metritis or endometritis.
- Observe the animal for signs of sickness. Consult your vet if this occurs. Removal by hand is no longer recommended. When the placenta has been lost, observe the cow for metritis described above.

5 What are the regulatory controls on specific infectious diseases of cattle?

Some infectious diseases of cattle are zoonotic (i.e. transmissible from animals to man), e.g. bovine tuberculosis (TB). Other infectious diseases have the ability to spread rapidly throughout the cattle population and cause very significant economic losses, e.g. foot-and-mouth disease. Both categories of disease are subject to national and international regulations and these are particularly important when it comes to the export trade in live cattle and beef. The World Organisation for Animal Health (OIE) is responsible for listing infectious diseases of livestock that should be subject to specific control measures and for prescribing the measures that are to be used by its 178 member countries across the globe. In addition, member states of the European Union are bound to comply with various pieces of legislation dealing with specific diseases of animals.

In the case of OIE-listed diseases which are known to occur in Ireland (endemic), the Department of Agriculture, Food and the Marine (DAFM) will most likely have a control or eradication scheme in place to ensure continued market access – this has been the case for bovine tuberculosis (TB), brucellosis, and BSE.

For OIE-listed diseases that do not normally occur in Ireland (exotic), DAFM will have made provision to ensure that they cannot be readily introduced or that if introduced, they can be rapidly detected and eliminated (e.g. Foot-and-Mouth disease, Bluetongue, etc.). Animal Health Ireland was established in 2009 to promote and develop an alternative industry-led approach to national control of economically-significant diseases of livestock – an industry-led approach. To date it has established programmes for the control of BVD, Johne's Disease, IBR and subclinical mastitis (the "Cell Check" programme) in cattle.