BETTERRETURNS

AHDB

Beef diseases directory

BEEF & LAMB

Contents

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Counting the cost of disease

Diseases in the UK cattle industry account for huge losses and are a major welfare concern. A team approach to farm health planning, involving the farm's vet, performance recording and identifying areas for improvement, can increase returns for beef producers.

Diseases lead to production losses through factors such as reduced daily liveweight gain (DLWG) or increased costs of feed. Animals may not always appear ill and without attention to herd performance, sub-clinical losses can soon add up.

In this publication, we highlight ever-present and significant conditions affecting the beef industry. We provide insight into the main symptoms and risk factors alongside the most effective prevention and treatment protocols. However, we recommend producers always consult their vet for clinical diagnosis and to discuss effective treatments.

Discussing a farm health plan with the vet provides the ideal opportunity to set out a strategic approach to disease prevention and management in the herd.

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AHDB Knowledge Transfer
Senior Manager

Abortion

Officially recorded cases of abortion in cattle are relatively low, but this is almost certainly due to under-reporting by farmers. Abortion covers all forms of infertility, from the loss (re-absorption) of a very young foetus to premature birth, but is usually defined as the birth of one or more dead or non-viable calves between 50 and 270 days of gestation.

Abortion is usually caused by one of a number of infectious agents and may affect one or two individual animals, but it can sometimes cause widespread problems in a herd. Diagnosis of bovine abortion can be difficult. Failure to identify the cause of abortion quickly and take action can result in a larger problem leading to significant financial loss.

Costs and implications

Even a single case of abortion represents a substantial loss in a beef suckler herd, as the affected cow is effectively rendered unproductive for the year. Purchasing a replacement calf to foster on to a cow that has aborted presents new risks to the herd.

Abortions may often be an indication of far wider disease problems and a single case can quickly become more significant.

In the UK, all abortions and premature births (before day 271 of gestation) must be reported to Defra, who will then determine the necessary course of action.

Many causes of abortion are zoonotic diseases, which means they can be transmitted to people. Young children, pregnant women and the elderly are especially vulnerable.

Common causes and consequences

Viral

- Infectious Bovine Rhinotracheitis (IBR) See page 34
- Bovine Virus Diarrhoea/Mucosal Disease (BVD/MD) See page 7

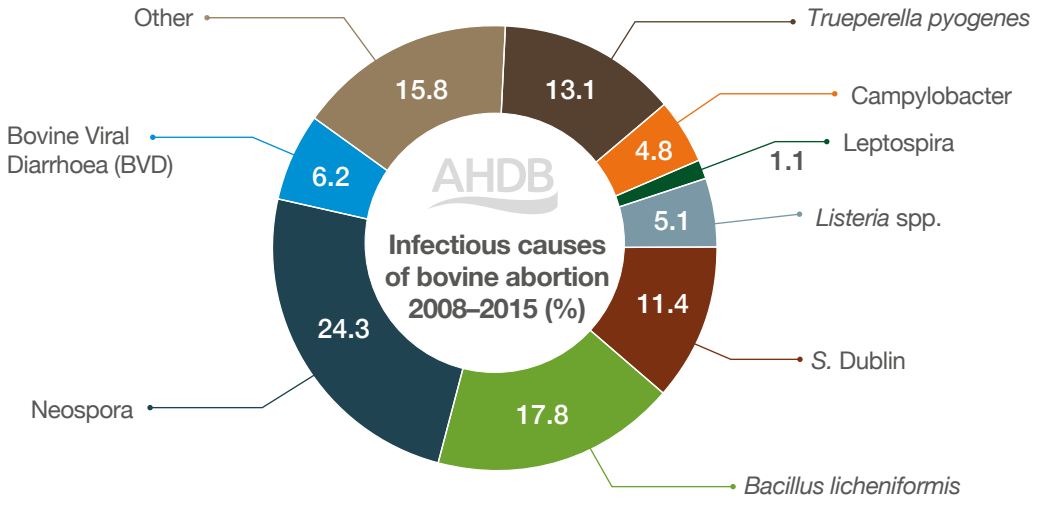


Figure 1. Infectious causes of bovine abortion 2008–2015 as a percentage of all cases where a diagnosis was reached (n=4,813) Source: VIDA report

Bacterial

Leptospirosis
Abortion often occurs 6–12 weeks after infection, usually in late pregnancy. It is also associated with reduced fertility and the birth of weak calves.

Campylobacter
Abortion and retention of diseased foetal membranes at four to seven months of pregnancy, typically first recognised by returns to oestrus following service by a carrier bull. Cattle bred by artificial insemination (AI) are not affected.

Brucella abortus
Brucellosis was eradicated from Great Britain in 1979. There have been reintroductions via imported cattle and the last outbreak was in Cornwall in 2004. Very high levels of abortion occur in newly infected herds. Brucellosis is a notifiable disease.

Salmonella
Abortion typically occurs in late pregnancy. By far, the most common cause is *S.* Dublin infection (when abortion often occurs in late summer), followed by *S.* Typhimurium. Ingestion to abortion typically takes six to eight weeks.

Listeria monocytogenes
Sporadic abortion during the winter months, linked to very poor-quality silage.

Bacillus licheniformis
Sporadic abortion, usually in late pregnancy, most commonly occurring in North West England and Scotland and due to Bacillus bacteria in mouldy hay, straw, silage and other feedstuffs.

Protozoal

Neospora caninum
The most commonly diagnosed cause of bovine abortion, which occurs at five to six months of pregnancy. Infection is carried by dogs and hound packs and is passed on in their faeces.

Fungal

Mycotic (fungal) abortion
Sporadic abortion, typically in the winter months and most common in the west country following harvesting conditions that promote fungal growth on hay, silage or straw. Usually affects cows in mid-late pregnancy, even if the infection is picked up earlier. It may affect up to 10% of the herd in some circumstances.

Early identification

Loss of the foetus before three months, may not be detected until the cow unexpectedly returns to oestrus. If abortion occurs later than three months, the foetus may be found, especially when cattle are housed, but retained foetal membranes may be the only evidence, particularly if wild animals have disposed of the foetus.

An aborted foetus at three to four months

Prevention and control

Biosecurity and disease-free status

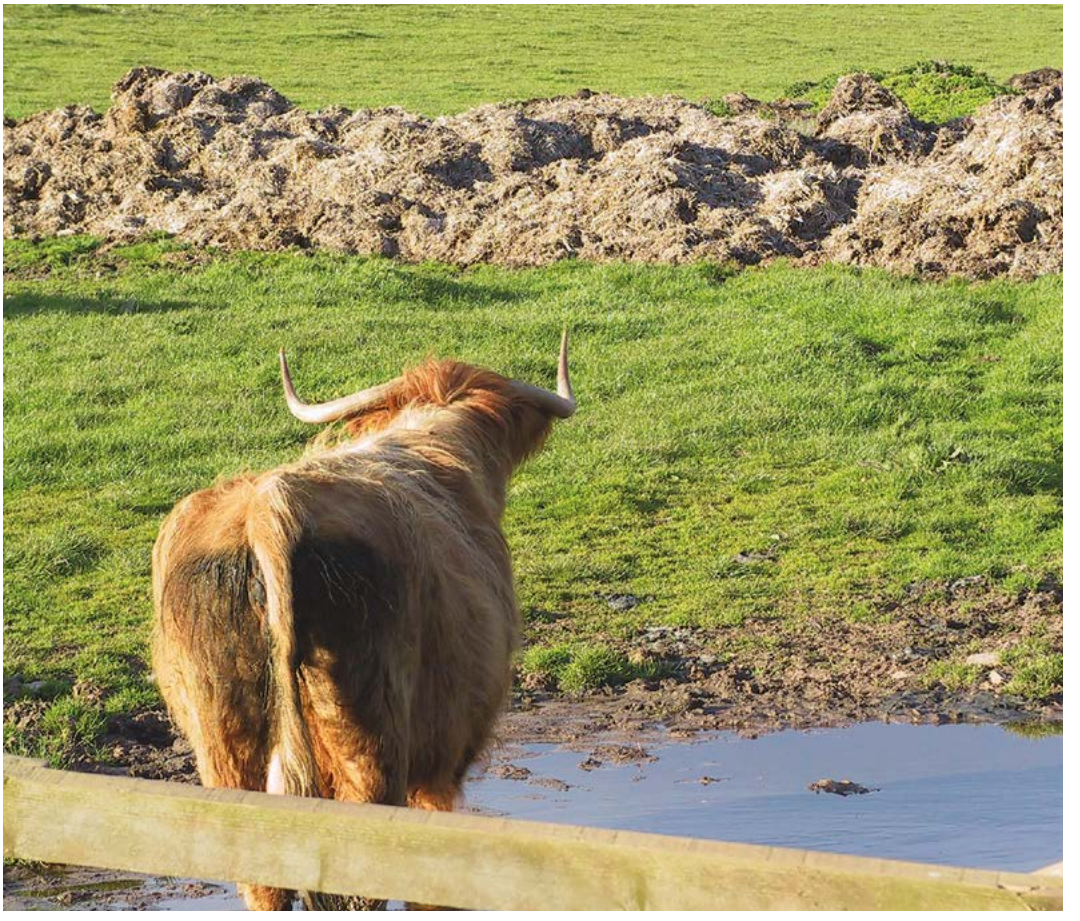
Strict biosecurity to maintain disease-free status is the first priority in minimising the risk of abortion. Abortions must be reported and it is important to isolate aborted cows and dispose of the products of abortion wherever possible to avoid potential vector animals gaining access. It may be advisable to keep the foetus and membranes for analysis.

Vaccination

Vaccination should be used to maintain the herd's disease-free status where appropriate. IBR, BVD/MD and *S.* Dublin can all be controlled through vaccination.

Feed quality

Several of the organisms causing abortion originate in poor-quality feed (e.g. *Listeria, Bacillus* and a host of fungal organisms and mycotoxins). It is therefore essential to apply the highest standards at all times to harvesting and feed storage procedures. If contamination has occurred, be vigilant and remove potentially harmful feeds.



This in-calf cow drinking surface water close to a dung midden could be at risk of picking up an infection that could cause abortion

Bovine Viral Diarrhoea (BVD)

Cows introduced to a herd from outside may present a BVD risk. Stringent biosecurity is essential to prevent infection

Bovine Viral Diarrhoea (BVD) is a widespread infectious disease of cattle that is usually transmitted through direct cattle-to-cattle contact. It is caused by a virus and lingers in herds through persistently infected (PI) animals. PIs can appear clinically normal but are super-spreaders and will produce more persistently infected animals if they go on to calve. It can also develop into the fatal condition mucosal disease after a secondary infection or changes in the virus within PI animals. Good vaccines are available and should be used.

In the UK, BVD is the result of infections with BVD Type 1 virus. BVD Type 2 virus is common in North America and has been identified in a number of European countries. It is an emerging risk for the UK, particularly through the import of cattle from Europe. No infection of naive cattle with any strain of BVD virus is ever 'mild'. There is always immunosuppression. There are strains of both Type 1 and Type 2 BVD virus that can cause more severe acute clinical disease and even death in adult cattle. There appears to be a greater likelihood of Type 2 viruses being more damaging.

If there is a risk from Type 2 viruses, a vaccine should be used to protect from both Type 1 and Type 2 viruses. Whatever vaccine is used, it should be used correctly and within an overall farm control strategy developed with your vet.

Costs and implications

BVD can lead to significant losses resulting from reduced fertility, poor production and increased vulnerability to other infections, especially in young calves. Losses are particularly severe where the virus is introduced to groups of susceptible breeding cattle.

Mucosal disease typically causes the death of the animal within 5–10 days, so cases should be culled on diagnosis. Calves born with eye and brain defects due to virus infection during development should also be culled.

Risk factors and susceptibility

All cattle are potentially susceptible to infection with the BVD virus. The virus can be spread in the semen of PI bulls (or bulls with a temporary infection).

High-risk situations:

- Introduction of PI cattle into a naïve (uninfected) and unprotected herd
- Introduction of naïve cattle into an infected herd

Early identification

Exposure to the BVD virus to non-pregnant cattle causes a temporary infection before protective antibodies are produced within three to four weeks. This infection may temporarily lower immunity to other infectious diseases, such as Salmonella, respiratory infections and coccidiosis, leading to more severe symptoms or ill thrift, particularly in young calves. However, animals may show no obvious clinical signs.

For cattle in early pregnancy, exposure to the BVD virus during the first 120 days can cause the following problems:

- Low pregnancy rates
- Embryo death and return to heat
- Foetal death/abortion
- Mummified foetuses
- Birth defects of nervous system and eyes
- Weak/premature calves
- Live PI calves

Mucosal disease occurs when the BVD virus in PI animals changes to a cytopathic (cell-killing) virus, typically in 6–18 month old calves, causing these symptoms:

- Depression, salivation and fever
- Anorexia
- Mouth and muzzle ulcers
- Pus discharges from eyes and nostrils
- Severe diarrhoea with blood and shreds of gut lining

Calves may appear poorly thriven in comparison with their herd mates due to persistent infection with BVD

Prevention and control

Vaccination

Where all breeding females are vaccinated, the disease is controlled by preventing BVD infection of developing foetuses during pregnancy and stopping the production of PI calves. It is important that heifers are fully protected by a BVD vaccination. This typically involves two doses, three to four weeks before the first service. This should be followed by annual booster vaccinations. Vaccination does not eliminate BVD and can only ever be one part of an overall farm BVD control strategy.

Elimination

Identification of PI animals is key. Whole herd blood testing and elimination of all PI carrier animals can effectively eradicate BVD from the herd. This must be backed up by strict biosecurity measures to prevent re-introduction to the herd. Several countries have successfully eliminated BVD and have shown the production and economic benefits.

Annual testing is essential to check the herd has remained free of BVD. The BVDFree England scheme, launched in 2016, is working to eradicate BVD in England by 2031.

Diagnosis and treatment

Diagnosis can be made through tests that identify the virus, such as a polymerase chain reaction (PCR) test or antigen ELISA test. It can be useful to perform serology on 5–10, nine-month-old homebred animals in each management group as a check test to classify a herd as currently actively challenged by BVD or currently free. See Cattle Health Certification Standards (CHeCS) for more information at **checs.co.uk**

Persistently infected calves may appear clinically normal but are commonly stunted or thin due to their susceptibility to bacterial infections such as pneumonia.

Two positive blood samples taken three to four weeks apart confirm persistent virus infection. These cattle have often been treated several times for digestive and respiratory infections and should be culled as they act as a source of BVD infection. Ear tissue samples taken when tagging calves ('Tag and Test') can also be used to identify PI calves, allowing their removal from the herd at the earliest possible stage.

BVDFree England is a voluntary industry-led scheme working to eliminate BVD from all cattle in England by 2031. The key to success is to identify and remove all animals with the BVD virus from the English cattle herd. For more information, go to bvdfree.org.uk

Diarrhoea (calf scours)

Severe diarrhoea, or calf scours, is one of the most costly disease issues affecting beef enterprises. It is responsible for 50% of calf mortality and leads to significant financial losses due to the severe growth check in recovering calves.

Variants of calf scours

The following are the more common and important variants of calf scours:

Rotavirus infection

Infection can cause a range of clinical signs, from no observed abnormality to severe diarrhoea and dehydration with high mortality.

Coronavirus diarrhoea

Infection can progress rapidly to weakness, recumbency, severe dehydration and death.

Enterotoxigenic *E. coli*

Incidence is low (1% of scouring calves), but losses can be high. Sudden onset of scour is accompanied by a bloated appearance.

Cryptosporidiosis

Diarrhoea is caused by the physical loss of the absorptive area from the small intestine and increases the severity of other potential infections. Dehydration tends to be mild, but calves lose condition over two to five days and have a dull, tucked-up appearance.

Coccidiosis

Caused by single-celled parasites, called coccidia. Coccidial species that cause disease damage the cell lining of the large intestine, resulting in diarrhoea.

Salmonella

Most commonly, *S.* Dublin is associated with producing acute or sub-acute illness in calves.

Costs and implications

Financial losses from calf scours can be crippling. Not only due to high mortality rates, but the cost of treatment (labour, drugs, etc.) can be significant, along with the impact of growth checks on calves that survive.

Risk factors and susceptibility

All young calves are potentially at risk of infection, but the following will increase the likelihood of disease occurring:

- Inadequate colostrum
- Poor standards of hygiene
- History of specific infection on the unit
- Replacements from another unit
- Rotavirus most commonly affects calves at 4–21 days (but can affect older calves)
- Coronavirus causes diarrhoea in calves up to 21 days old
- Enterotoxigenic *E. coli* typically affects calves aged one to three days
- Cryptosporidiosis is most common in calves 4–21 days old
- Coccidiosis is particularly common in calves between three weeks and six months old
- Salmonella usually affects calves two to six weeks of age

Early identification

Early signs for the main diseases are:

Rotavirus

Reluctance to stand and suck, mild depression, salivation, quickly followed by acute onset of diarrhoea (watery yellow/green faeces).

Coronavirus

Depression, reluctance to suck and faeces containing mucus and milk curds.

Enterotoxigenic *E. coli*

Profuse yellow/white diarrhoea causing rapid and severe dehydration. Calves quickly become recumbent and bloated.

Cryptosporidiosis

Profuse yellow/green diarrhoea with mucus present.

Coccidiosis

Watery diarrhoea, often accompanied by straining, mucus and blood, depression, lack of appetite and weight loss.

Salmonella

Pasty diarrhoea often with blood and shreds of mucus from the intestine with an offensive odour. Calves can rapidly become dehydrated, collapse and die.

Prevention and control

Management

The risk of all forms of calf scours can be minimised by ensuring calving areas are clean and well-bedded, preferably mucked-out between calvings.

Calves need a first feed of three litres of good-quality colostrum within two hours of birth, followed by another similar sized feed within 6–12 hours of birth.

In the case of cryptosporidiosis, where the parasite can remain in the environment for months, it is important to avoid using the same fields for calving and to move newborn animals immediately to clean pasture. For the prevention of cryptosporidiosis, use *Cryptosporidium*-effective and licensed disinfectants as many common farm disinfectants are not effective.

Vaccination

Annual vaccination of pregnant cows with a combined rotavirus, coronavirus and *E. coli* K99 vaccine provides valuable insurance. Protective antibodies are passed on in the colostrum, so sufficient colostrum ingestion is key.

Diagnosis and treatment

Diagnosis from symptoms outlined above and/or through laboratory analysis of faeces (ideally from untreated animals) should be carried out by the vet to determine the cause(s) of diarrhoea.

Treatment of severely scouring calves:

- Isolate in a well-bedded pen
- Feed one to two litres, four to six times a day, allowing four to eight litres of fluid to be given daily (stomach tube once and consult vet if calves will not suck through a teat within two to four hours). Alternate electrolyte fluids and milk, allowing at least two hours between feeds
- If dehydrated calves cannot stand unaided, intravenous fluids should be administered by the vet
- Antibiotic injections should be used for concurrent infections (e.g. navel ill)
- Offer fluids by teat as active sucking is an indicator of improvement

For more information, see ***Better Returns from calf rearing guide***, available in hard copy and online at **ahdb.org.uk**

Eye conditions

Infectious Bovine Keratoconjunctivitis (IBK), also known as Pink Eye or New Forest Disease, is a highly contagious disease caused by the bacteria *Moraxella bovis*. It spreads rapidly during the summer and is more commonly seen in young stock than adults.

Bovine Iritis, also known as Silage Eye, is a common cause of inflammation of the middle layer of the eye. It can occur in cattle of all ages that are fed baled silage/haylage.

Cancer Eye (Ocular Squamous Cell Carcinoma) is uncommon in northern Europe. These cancerous growths typically develop from the third eyelid (the membrane of the lower eyelid) following prolonged exposure to sunlight.

Costs and implications

Lesions in and around the eye are very painful and will disrupt grazing, causing poor performance and weight loss. They can also cause temporary blindness, with affected animals wandering about aimlessly.

Risk factors and susceptibility

Flies act as mechanical vectors for *M. bovis*. Foreign bodies such as dust, grass awns or small bits of ensiled grass stalk can cause Bovine Iritis.

Early identification

Infectious Bovine Keratoconjunctivitis (IBK)

The first signs of IBK are obvious tear staining of the face, with pus matting the lashes and hair below the affected eye. Animals find it painful to be in direct sunlight.

Spontaneous recovery may occur in mild cases after three to five days and the animals will be better after two weeks.

In severe cases, ulceration may lead to perforation of the surface of the eye (cornea).

Bovine Iritis

Initial signs include excessive tear staining, blinking and forced closure of the eyelids.

A bluish-white opacity is usually seen on the cornea within two or three days. This can turn yellow as pus accumulates beneath. These lesions can take several weeks to clear without treatment.

Bovine Iritis is characterised by a blueish-white opacity on the surface of the eyeball

Cancer eye

Cancerous growths may irritate the eye surface, leading to secondary corneal ulceration and infection, leading to eyelid closure. There is usually a discharge due to mechanical irritation of the eye.

White-faced cattle are more prone to cancer eye due to the lack of pigment around the eyes. Cancer eye is most common in cattle aged seven to eight years. It is not common in cattle under three years of age.

Cancer eye in right eye

Prevention and control

Infectious Bovine Keratoconjunctivitis (IBK)

Outbreaks of IBK can occur after the introduction of purchased stock. All new cattle should be initially managed separately as one group, away from the main herd.

Fly control, using ear tags and pour-on insecticides, is never absolute and repeated treatments are costly. The development of immunity following infection is variable.

Injection of all at-risk cattle with a single intramuscular injection of long-acting antibiotics could be considered in severe epidemics. Discuss the options with the vet.

Lashes matted with pus indicate an eye infection

Bovine Iritis

Rolling out big-bale silage rather than placing it in ring feeders will prevent cattle from burrowing their heads into the bale, but this may be impractical.

Attention to detail when baling and wrapping, and ensuring good conditions for fermentation should limit contamination with *Listeria monocytogenes*, the bacteria that cause the problem.

However, a bale left exposed to the air for several days before being eaten provides an ideal environment for *L. monocytogenes* to multiply. Good bale management at feed-out is vital.

Yellow pus accumulates in the eye with Bovine Iritis

Cancer eye

If there are suspected cases within the herd, the vet should be consulted to determine the appropriate course of treatment.

Hypomagnesaemia *(grass staggers, grass tetany)*

Hypomagnesaemia is a common metabolic/feeding-related disease that usually affects older beef cows (fourth calving or older) but can occasionally affect younger cattle. It is often fatal if not detected within hours and treated correctly, so it should be considered a veterinary emergency.

The condition is caused by low blood magnesium concentrations resulting from seasonal deficiencies in grazed grass and is most common in cows that have been calved for one to three months. Dry cows can also be affected if not receiving supplementary feed. Hypomagnesaemia can potentially affect numerous cows in a herd or group. Stress factors such as bad weather or handling can trigger clinical cases where there is an underlying problem.

Affected cows are typically found lying with their head thrown back and might be thrashing wildly. Cows may appear quiet at times, but handling usually leads to fitting.

Costs and implications

The loss of a suckler cow exceeds £1,000. All sudden deaths in adult cattle must be reported to the local Animal Health Office and tested for anthrax. Once tests prove negative, further testing is carried out to establish magnesium concentration. Blood sampling of other cows in the group is recommended to establish herd status.

Risk factors and susceptibility

- Lush spring grazing, particularly in recently turned-out spring calvers
- Autumn grazing for autumn calvers, particularly after stormy weather
- Cows one to three months post-calving (fourth calving onwards)
- Dry cows not on supplementary feeding

Early identification

Cows with low blood magnesium concentrations may appear normal until stress factors trigger the rapid onset of ‘staggers’.

However, the following signs may provide an early warning in some cases:

- Restlessness and excitability
- Unsteadiness
- Tremors of the skin over the shoulders
- Eyelid tremors

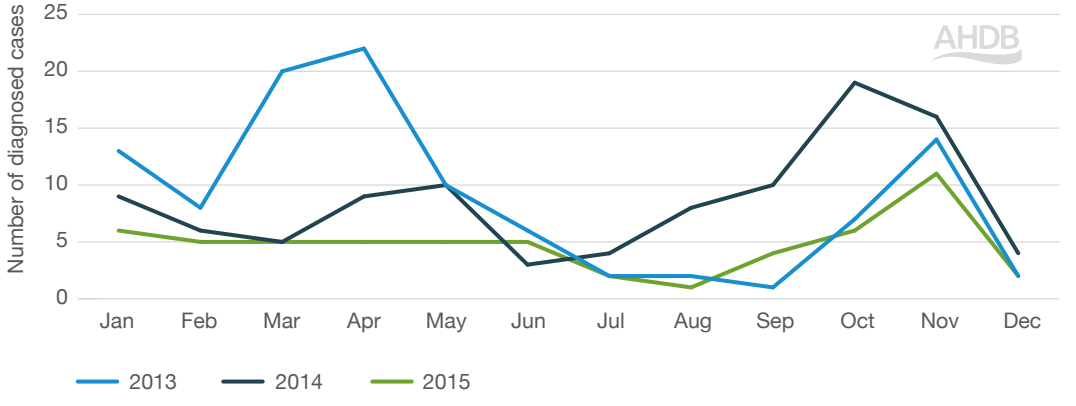


Figure 2. All cattle monthly diagnosed cases of hypomagnesaemia in cattle 2013–2015
Source: VIDA report

Prevention and control

Ensure daily intake of magnesium.

This is essential as cows are unable to store magnesium in the body.

Feeding cattle concentrates containing an appropriate magnesium supplement (1–2 kg/cow/day) is the most reliable method of ensuring cattle receive enough magnesium.

Home-mixed rations should be supplemented with magnesium as many straights are typically deficient.

Ad-lib minerals are not a reliable source of daily magnesium for all cows in a group. The most reliable method of control is to give a magnesium bolus.

Supplement grazing with straw

Good-quality barley straw fed ad lib helps slow the flow of lush grass through the gut and aids magnesium absorption.

Avoid potassium fertilisers

Potassium interferes with magnesium absorption and should not be included in compound fertilisers spread onto grassland during risk periods.

Diagnosis and treatment

Diagnosis is based on clinical signs and can be confirmed through blood sampling.

Symptoms of hypomagnesaemia should be treated as a veterinary emergency. Fitting cows can be sedated first by the attending vet. Treatment will typically involve intravenous injection (by vet) administered slowly, followed by further injections at several sites, using a mixture containing small amounts of magnesium in a calcium solution.

If hypomagnesaemia is suspected or confirmed, it is essential to deal with the risk to the rest of the group.

Use straw to supplement grazing

Hypomagnesaemia is a veterinary emergency

Turn-out onto lush pasture is a common factor involved in hypomagnesaemia

Johne's disease (paratuberculosis)

Johne's disease is a slow progressive gut inflammation in adult cattle caused by a bacterium, *Mycobacterium avium* subspecies *paratuberculosis* (or MAP for short). It is characterised by progressive weight loss and chronic diarrhoea, but diagnosis and control are particularly difficult.

Costs and implications

Infected herds may suffer annual culling or mortality rates of 1–5%.

Losses due to sub-clinical disease, including weight loss and poor fertility, are also substantial.

There is no effective treatment and animals should be culled as soon as a diagnosis is confirmed.

Risk factors and susceptibility

Clinical cases of Johne's disease are not usually seen in cattle until they are three to five years old, although cases in younger animals are possible. The organism is passed onto younger cattle by older infected cattle and there is then a long incubation period.

The disease can be transmitted by being:

- Picked up from infected faeces found on contaminated teats, feedstuffs or water troughs
- Passed to newborn calves in the colostrum of infected dams
- Passed from heavily infected dams to developing calves in the uterus

Infected animals may shed causative organisms in their faeces for over a year before clinical signs appear.

Consumption of drinking water contaminated with faeces of infected animals aids the spread of disease and is often fatal

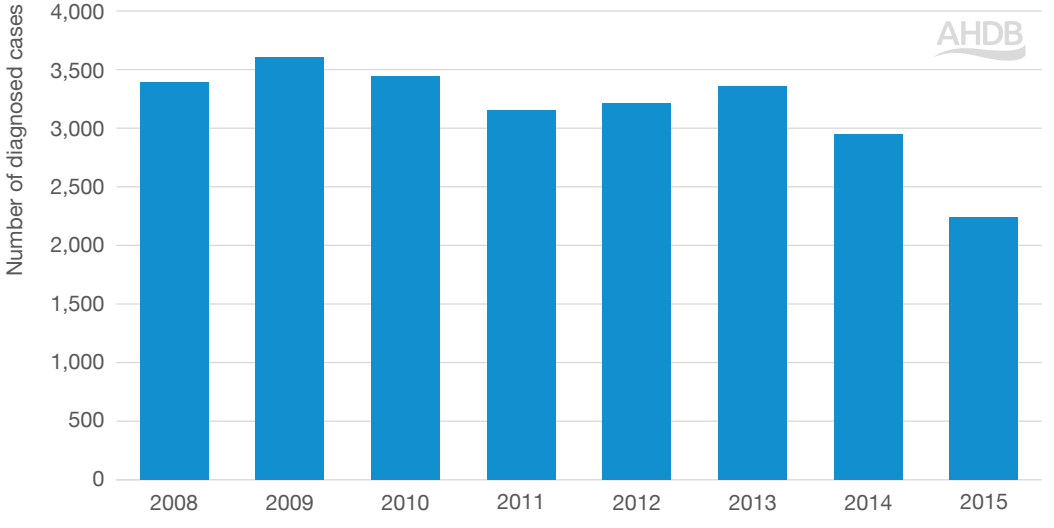


Figure 3. Johne's disease in cattle 2008–2015 Source: VIDA report

Early identification

Signs can appear following a stressful event, such as calving or transportation.

Prevention and control

Johne's disease is difficult to control due to the long incubation period and the fact that animals will pass on infection long before they show clinical signs. Diagnosis is also unreliable, particularly in the early stages of the disease.

Practical control measures to limit losses include:

- Rapid culling of MAP infected animals, ideally well before they develop clinical disease and diarrhoea
- Not using calves from infected dams as replacements as there is a high risk that they are also infected
- Reducing the risks of faecal contamination of food, water and pasture, e.g. raise feed or water troughs, avoid the use of surface or pond water for drinking, avoid spreading farmyard manure on pastures
- Calving yards or boxes should be kept as clean as possible to reduce the exposure of newborn calves to MAP and to keep teats and udders of freshly calved cows as clean as possible
- Avoid feeding pooled colostrum and cross-suckling in herds infected with MAP
- Keep cows and the environment as clean and free from faecal contamination as possible, especially during the calving period and for the first three months of the calves' lives
- Avoid co-grazing sheep and cattle where possible as the disease can pass between the two species
- Control rabbits
- Only restocking from accredited herds, especially when restocking bulls. Johne's disease has a long incubation period, and the sensitivity of the currently available laboratory tests are relatively poor. A single negative test on a young replacement breeding animal, whether bull or heifer, is relatively meaningless. The longer a herd has been accredited, the more confident you can be in its risk status

A clean calving environment is essential in controlling the spread of Johne's disease

Vaccination may be an option for heavily infected herds rearing their own replacements to reduce clinical cases, while hygiene and other measures are put in place to reduce the level of MAP infection. However, it will not eliminate the disease and a vaccine would need to be imported into the UK under licence. Vaccination interferes with the interpretation of the TB skin test. Any vaccination strategy should be developed with the farm vet and official approval may be required.

Vaccination is not a long term solution, as it will not prevent all infections with MAP or the disease from spreading.

Health planning

In order to minimise the losses caused by Johne's disease, it is important to define a herd's disease status and then to take appropriate action. Discuss routine blood testing with your vet.

- The CHeCS accredited health schemes provide an assessment of the risk of Johne's disease being present in a herd to allow the marketing of cattle with an accredited risk level
- Control strategy is based on the identification and removal of infected animals
- Blood testing and/or faecal examination is done every 6–12 months with the slaughter of positive cases. Herds are assigned a risk level 1–4. Three consecutive annual clear tests will result in a risk level 1 for a herd
- Strict biosecurity measures are required to prevent reintroduction of the disease

Diagnosis and treatment

There is no single, reliable test for confirming Johne's disease during its early stages. In practical terms, diagnosis is best achieved through a combination of blood tests and faecal examination carried out every 6–12 months.

There is no effective treatment and animals should be culled as soon as a diagnosis is confirmed. It is recommended that the progeny of infected cows are not kept as breeding replacements.

Lameness

Lameness resulting from pain and/or incapacity in the feet can result from a number of interacting factors in the environment of cattle. It is most problematic when affecting a stud bull or breeding cows during the breeding season and is a serious welfare issue in all livestock.

Foot lameness can be caused by the following conditions:

- 'Foul of the foot' and digital dermatitis (bacterial infection between the claws)
- Hyperplasia (excess skin growth between the claws, which is hereditary)
- White line disease (separation of wall horn from the sole)
- Sole bruising, sole ulcer, sole abscess (damage to sole horn and damage to horn producing tissue)
- Sandcrack (vertical fracture of the hoof wall)
- Overgrowth (elongation of the foot)
- Corkscrew claw (hereditary)

Costs and implications

Lame cattle are unproductive cattle, whether breeding animals or fattening stock.

Weight loss is a common consequence in grazing cattle, with delayed heat and poor conception a possibility in suckler cows.

Infertility is likely to be the single biggest cost implication.

Common causes and consequences

Foul of the foot/digital dermatitis

This typically occurs as a sudden onset of lameness and the animal only 'toes' its foot to the ground. It is usually the result of wet dung and mud softening the interdigital tissue and sharp stones causing wounds that allow bacteria to infect the deeper tissues. Reservoirs of infection can survive in wet areas around gateways.

The lesion appears as a widening of the interdigital space with swelling progressing up the leg as far as the fetlock joint. There is usually a break of the skin with damage of tissue between the claws.

Digital dermatitis is caused by a type of bacteria called treponemes. It typically produces a red, swollen lesion between the claws of the heel ('hairy heel warts') but can infect and complicate the healing of many other types of lameness. It is a major problem in the dairy industry, which is also emerging in beef herds.

Foul of the foot

Digital dermatitis

Hyperplasia

This hereditary condition appears as excess skin growth at the front of the interdigital space and is most commonly seen in the hind legs of bulls. Lameness can result from superficial infection.

White line disease

White line disease is the separation of the wall horn from the sole horn as a result of disruption of the claw horn.

Any sharp object can penetrate the sole and cause an abscess that is typically recognised as a black mark overlying the pus.

Impaction of dirt and small stones in the white line can result in white line abscesses. Lesions are usually found in the outer claw of the hind foot, on the outside border close to the junction with the heel, as this is where there is most physical stress.

If left untreated, the infection can extend up the hoof wall and erupt at the coronary band.

Sole bruising and sole ulcers are areas of damaged sole horn generally the result of damage to the underlying horn producing tissue.

Sole ulcers can be caused by excessive standing on concrete, especially in the post-calving period. Although more of an issue in the dairy industry, it can also be a problem in cubicle-housed beef cattle. If infection enters, you may get sole abscesses. Sharp objects can penetrate the sole and cause an abscess that is typically recognised as a black mark overlying the pus.

Sandcrack

This is a vertical fracture of the hoof wall of variable degrees between the coronary band and the bottom of the wall. The depth of the lesion varies, and pus may or may not be present.

Excessive drying-out of the hoof horn during the summer months is thought to be the cause of this condition, though this is uncertain.

White line disease

Overgrowth

This is an elongation of the foot, especially affecting the hind feet. The condition reduces the weight-bearing surface of the foot and in the later stages, the toe bends upwards and no longer touches the ground.

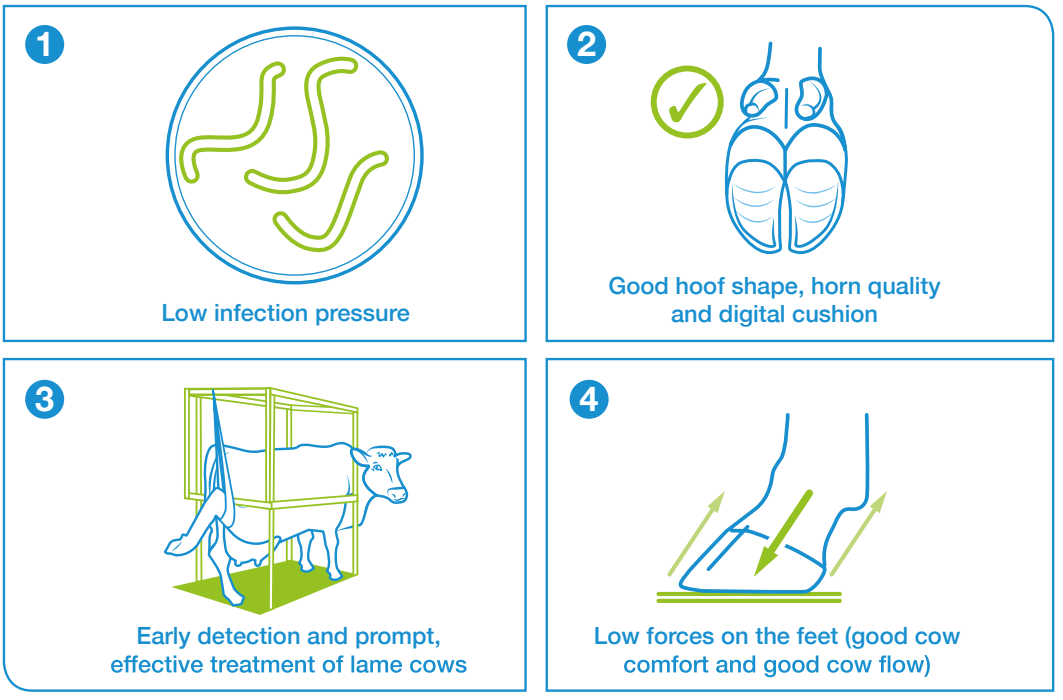
Overgrowth is typically caused by a lack of natural wear when cattle are housed in straw yards.

Corkscrew claw

A heritable condition typically causing the outer claw of the hind leg to be twisted.

Treatment

All lame cows should be attended to promptly, with veterinary treatment required when the cause of the lameness cannot be determined and/or when the lameness persists after treatment. Foot trimming should only be carried out by a trained person. Lameness is a painful condition and prompt, effective treatment will reduce healing time and loss of production.



The four key success factors for healthy feet

Foul of the foot/digital dermatitis

It is essential to lift the animal's foot to check for impacted foreign bodies, clean the foot and spray the wound with oxytetracycline aerosol. Antibiotics may be required; consult your vet to determine the most effective treatment.

Prevention is by regular footbathing and improved hygiene. Disinfection of hoof knives by foot-trimmers to prevent inter-herd spread is important, as is footbathing of purchased animals.

Hyperplasia

Treat any infection with oxytetracycline and if necessary, injectable antibiotics. Surgically remove the growths as a last resort.

White line disease/sole ulcer/ sole abscess

Pare down with a hoof knife to release the pus and remove all under-run horn – there should be no bleeding. Avoid damage to the sensitive corium, as this will delay the healing process. Antibiotic treatment should not be necessary. A shoe block may be used to relieve weight from the sensitive claw where a large area of the sole has been pared off. The use of anti-inflammatories is also recommended to reduce pain and speed healing.

Sandcrack

Remove all affected horn by paring out a shallow 'V'. Antibiotic treatment is not necessary.

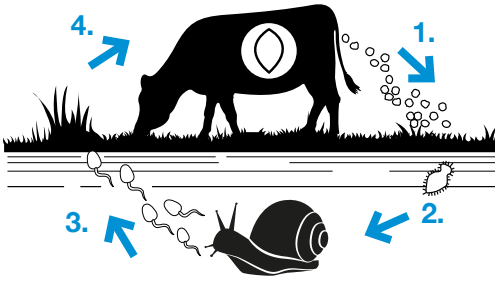
Overgrowth/corkscrew claw

Corrective foot trimming is required.

For more information, see ***Lesion recognition and troubleshooter guide*** and ***Foot trimming cattle to prevent and treat lameness*** available at **ahdb.org.uk**

Liver fluke (Fasciolosis)

This disease is a common and devastating condition, commonly found in wet grazing land. It results from the infestation of the liver by the leaf-shaped parasite *Fasciola hepatica* (liver fluke).



1. Eggs pass to pasture in the dung.
2. Eggs hatch into water-borne larvae, which infect mud snails.
3. Larvae develop into young fluke before leaving the snail and migrating on to wet herbage.
4. Young fluke are eaten by livestock grazing wet areas where the mud snail lives.

Costs and implications

Severely affected cattle become weak, emaciated and unable to stand, with sudden death a possibility.

Even in less severe cases, weakness caused by liver damage may lead to an increased incidence of metabolic and infectious diseases, particularly in cows in late pregnancy. Birth of weak calves is likely, particularly in cows on marginal winter rations. Fluke has been estimated to cost around £200/head in cattle.

Risk factors and susceptibility

All grazing cattle are susceptible to liver fluke.

Eggs from an infected animal can complete the life cycle and reinfect grazing animals in a minimum of 20 weeks.

Risk tends to be associated with wet pastures, where there is sufficient moisture or standing water to support the snail.

Exceptionally wet weather or successive wet summers can increase the risk in pastures not previously identified with the disease.

Infested sheep brought onto a farm for over-winter grazing will contaminate pasture and increase the risk to cattle during the following summer/autumn.

Mud snail

Early identification

The following signs may indicate liver fluke infection:

- Persistent diarrhoea
- Chronic weight loss despite adequate feeding
- Anaemia in severe cases

Liver fluke is commonly confused with:

- Poor nutrition (where it is a whole herd or group problem)
- Johne's disease (several cows in a group or herd)
- Salmonellosis (several cows in the group or herd)
- Parasitic gastroenteritis
- Rumen fluke – less common than liver fluke but can cause diarrhoea and ill thrift in young stock. It is important to differentiate as treatment options are different

A bovine liver with fluke infection

Prevention and control

Liver fluke control plans should take into account herd fluke history, past treatment, the presence of high-risk areas for snail habitats, and time of year.

An effective control plan will include the use of flukicides to prevent disease and reduce pasture contamination, as well as grazing strategies to avoid heavily contaminated pasture.

Youngstock and adult cattle should be treated after housing, and animals kept outside may require additional treatments depending on risk.

Fencing off wet areas or carrying out drainage will restrict snail habitats, but this may be impractical – particularly in extensively farmed areas. It may also be prevented by environmental stewardship protocols.

Control using effective flukicide treatments may therefore be the best solution. In areas where liver fluke is endemic, strategic flukicide treatments should be given in accordance with the veterinary herd health plan.

Diagnosis and treatment

Diagnosis in the early stages may be carried out if high-risk conditions are prevalent and is based on raised liver enzymes in blood samples analysed by the vet.

The chronic condition is identified from the symptoms outlined above and may be confirmed through the identification of fluke eggs in dung samples, though these may be scarce and difficult to find. Specific antibody tests for liver fluke can be carried out but do not necessarily indicate current infection, as antibodies can persist from the previous year. The faecal coproantigen test detects fluke secretions in faeces so it can indicate infection before the production of fluke eggs or antibodies.

It is important to use flukicide treatments that target the liver fluke stage most likely to be present within the animal at the time, to help reduce selection pressure for anthelmintic resistance. Effective treatment of all stages of fluke is achieved with triclabendazole. Nitroxynil and oxyclosanide are less effective against young flukes and should be used in the treatment of adult flukes (chronic disease). Resistance to triclabendazole is emerging, so repeated doses with adult flukicides are often more appropriate for the strategic control of fluke in beef cattle.

Improved nutrition of affected cattle is essential.

Quarantine

Quarantine of incoming cattle is important to help prevent the introduction of liver fluke onto fluke free farms that have potential snail habitats and, to prevent the introduction of triclabendazole resistant liver fluke populations onto farms with no evidence of resistance.

For more information, visit COWS website: **cattleparasites.org.uk**

Lungworm *(husk or hoose)*

Husk (or hoose) is caused by an infestation of the bronchial tubes by white thread-like worms known as lungworm *(Dictyocaulus viviparous)*. The condition is characterised by persistent coughing and breathing difficulties, with lung damage potentially developing into secondary pneumonia.

Cattle become infected by ingesting lungworm larvae while grazing. These infective larvae penetrate the intestinal wall and pass via the lymphatic system and bloodstream into the lungs. In the lungs, these larvae develop into adults, which cause the problem.

Female lungworms lay vast numbers of eggs. These are carried up the windpipe in mucus, where they are then swallowed. The eggs hatch in the digestive tract and are passed out in the dung onto the pasture. The cycle then begins again.

Costs and implications

In its most severe form, lungworm can result in sudden death. More typically, affected cattle will suffer marked loss of body condition (up to 10% of body weight), with growing cattle potentially losing 20–40 kg. With long recovery periods and the possibility of secondary pneumonia requiring antibiotic treatment, losses from a severe outbreak in growing cattle can average £50 per head.

Risk factors and susceptibility

Young (first grazing) cattle are at greatest risk if grazing pastures have been recently stocked with older cattle. Adult cattle can develop a natural immunity through grazing moderately infested pastures. However, if they have not been previously exposed to infection, they will also be at risk.

Autumn grazing conditions are typically most favourable to the development and survival of heavy lungworm larvae infestations on pasture.

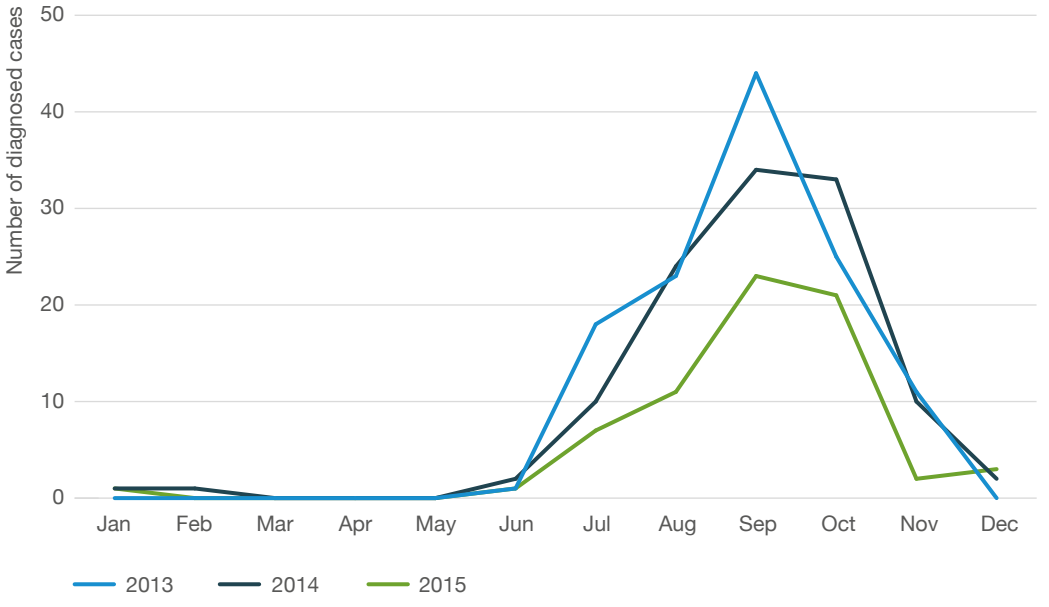


Figure 4. Monthly diagnosed cases of lungworm in cattle 2013–2015 Source: VIDA report

Young cattle grazing for the first time are at risk from lungworm

Early identification

The following signs may indicate lungworm infection:

- Panting
- Frequent coughing, especially after short periods of exercise
- Reluctance to move
- Standing with head down and neck extended, often gasping for breath

Prevention and control

Cattle exposed to lung infection through grazing moderately-infested pastures allows the animal to develop immunity through natural exposure. This must be combined with strategic worming treatment during the grazing period to prevent the disease from developing. This is a risky control strategy and is not recommended.

Vaccination prior to first grazing should provide immunity for six months.

This costs £10–£15 per animal and in combination with good management practice, is the best insurance against lungworm.

Worming relies on a low dose early in the season, which stimulates immunity afresh each year. Avoid over-worming early in the season as lungworm can also strike during late grazing. Discuss a strategy with the vet each year.

Diagnosis and treatment

Diagnosis is based on clinical signs outlined above and may also be confirmed through laboratory analysis of dung showing the presence of larvae or by a blood test.

When the disease is identified, prompt worming treatment is essential, using a product recommended by the vet. Severely affected animals may require additional supportive treatment, which should be discussed with the farm vet.

Midge-borne diseases

Over recent years, several viruses transmitted by *Culicoides* midges have emerged in European livestock, leading to significant economic losses. The two main diseases to affect beef cattle are Bluetongue virus (BTV) and more recently, Schmallenberg virus (SBV).

All cattle are susceptible to the disease if they come into contact with a biting midge carrying the virus. Actions to prevent both these diseases have shown little impact. However, the following are suggested measures:

- Identify and destroy midge breeding sites (dung heaps, damp areas, etc.)
- Use mesh (impregnated with insecticide) to prevent midges from entering buildings
- Apply pour-on insecticides to cattle
- Strict biosecurity and quarantine of all livestock brought onto the farm are essential in the control and prevention of all diseases

Bluetongue virus (BTV)

Bluetongue virus is a viral disease of sheep and cattle that is characterised by lameness and fever and can result in serious production losses and mortality. The spread of the disease is dependent upon the presence of the *Culicoides* midge host.

The BTV 8 virus was identified in Belgium and the Netherlands in 2006 and spread rapidly to central and western European countries. The first incidence of BTV 8 in the UK was reported in East Anglia in September 2007, which supports the theory that transport of midges on air currents from continental Europe is a potential threat. This outbreak was controlled by the strategic use of vaccination, but other strains of BTV continue to be a threat. BTV 8 was detected again in cattle in France in May 2017, and BTV cases have also been reported in Belgium, Germany, Italy, Spain and Switzerland. BTV has been identified in cattle imported to the UK – the cattle were slaughtered without compensation. If importing cattle, extreme care is recommended in ensuring full compliance with all pre- and post-import requirements.

Bluetongue virus: extensive teat damage may occur

Schmallenberg virus

Schmallenberg virus (SBV) was identified in Germany in November 2011.

Schmallenberg virus primarily infects domestic and wild ruminants and causes clinical signs including diarrhoea, moderate hypothermia, decreased milk production and anorexia in adult cattle. Sheep and goats can be mildly affected. Infection of bovine foetuses by SBV is associated with abortions, premature births and stillbirths, diverse congenital malformations and abnormalities of the central nervous system.

Schmallenberg virus: calf affected by deformities

Schmallenberg virus spread rapidly from Germany and the Netherlands to the UK, France and other European countries.

There is evidence of continued virus circulation and successful overwintering in the UK. It is not known how long natural immunity to SBV may last, but it appears that immunity in herds is patchy and does wane, with some animals remaining vulnerable. Animals born in years when the virus is not circulating on the farm will be susceptible to infection. SBV is expected to recirculate in the UK at regular intervals of around 2–3 years.

A commercial vaccine is available and discussion with the vet is important to manage the ongoing risk of SBV.

Costs and implications

Bluetongue is a notifiable disease in the UK and suspected cases must be reported immediately to the local animal health office.

The clinical signs – delayed recovery, susceptibility to secondary bacterial infections and potential mortality of cattle – mean that significant production losses are inevitable.

The costs of BTV have been estimated at up to £19/sheep and £17/cow on affected farms from:

- Deaths
- Loss of production
- Cost of disposal
- Veterinary and medicines
- Labour

In Germany, it was estimated that BTV infection costs €27 per animal on average, mainly because the animals took longer to finish. The cost of schmallenberg depends on the severity of the outbreak.

The UK is currently declared BTV-free. Any suspected cases of the bluetongue virus must be reported quickly. Report it immediately by calling the Defra Rural Services Helpline on 03000 200 301. For further information, visit gov.uk/guidance/bluetongue

Early identification

The following symptoms are most likely to occur in affected cattle:

- Fever (temperatures over 39.5°C)
- Stiffness and reluctance to move, due to swelling of the coronary band at the top of the hooves, reddening of the skin above the hoof
- Nasal discharge and crusty erosions of the muzzle
- Lacrimation (discharge from the tear ducts) but no obvious eye lesions
- Lethargy, not eating
- Most adults show only mild clinical signs or show no signs of disease at all

Prevention and control

Vaccines may be available through the vet. Always follow the manufacturer's guidelines. In the case of an outbreak of bluetongue, Defra protocols should be implemented on infected premises.

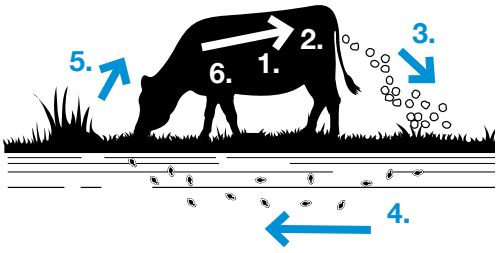
Diagnosis and treatment

Diagnosis is based upon clinical signs and/or isolation of the bluetongue virus or schmallenberg virus.

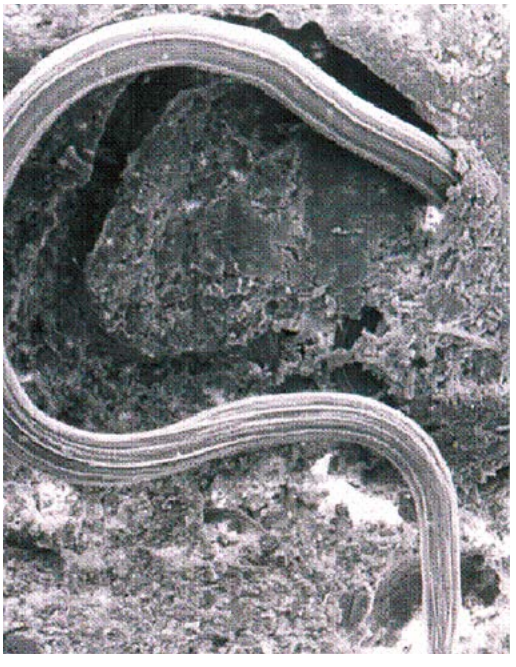
There is no fully effective treatment for clinically affected animals. Treatment is limited to antibiotic therapy to control secondary bacterial infections.

Parasitic gastroenteritis *(PGE or gut worms)*

Parasitic gastroenteritis (PGE) is caused by mixed infections with stomach and intestinal worms and usually affects growing cattle during their first summer at grass. PGE is not usually seen in adult cattle.



1. Adult nematodes in digestive tract.
2. Eggs are laid in digestive tract.
3. Eggs are excreted onto pasture.
4. Eggs hatch; larvae develop into infective stage.
5. Host ingests infected larvae.
6. Larvae mature to adult.



Larvae mature to adult in the digestive tract

Ostertagiosis (parasitic gastritis)

The damage caused by the maturation of *Ostertagia ostertagi* larvae in the abomasum (fourth stomach) results in parasitic gastritis.

Type I Ostertagiosis

Typically seen in susceptible calves or yearlings during the late summer/early autumn and is caused by the ingestion and immediate maturation of large numbers of infective larvae.

Type II Ostertagiosis

Results from the ingestion of infective larvae from autumn onwards, with disease being caused later in the winter months following delayed emergence of the adult worms from inhibitive larvae.

Costs and implications

Losses from a severe outbreak of parasitic gastroenteritis in growing cattle could reach £50/head. This is due to a marked loss of body condition (up to 10%) and a long recovery, resulting in extended finishing periods (up to three months).

Low-cost, preventative programmes are available to all producers.

Risk factors and susceptibility

Any cattle (usually growing cattle in their first grazing season) are susceptible to parasitic gastroenteritis if they are exposed to contaminated pasture before they have developed natural immunity.

Circumstances that increase the risk:

- When young calves are grazed for the first time on pastures that have been repeatedly grazed by other young calves, resulting in a build-up of infective larvae

- When weaned beef calves are grazed on contaminated pasture during their second season when they have not had sufficient exposure in their first grazing season
- When a dry early summer is followed by wet weather during August and September, resulting in mass emergence of larvae and ingestion by grazing cattle (Type I)

In spring-calving beef herds, early season pasture contamination is ingested by immune adult cows

Early identification

Type I Ostertagiosis

Characterised by loss of appetite and sudden and profuse green diarrhoea in the late summer/early autumn period. Symptoms can affect most animals in a group within a few days.

Type II Ostertagiosis

Disease symptoms are sudden and severe. They are seen during the late winter months, following delayed maturation of the larvae.

Treatment and prevention

Prevention is far more cost-effective than treatment; planning worm control can save significant amounts of money.

For most farms, wormers will still be an essential part of economic stock production, and strategic wormer use needs to be built into the worm control plan. Each farm should have its own individual worm plan, based on farm management, previous worm history and type of stock. It is important to keep detailed records of grazing patterns and previous anthelmintic problems in order to tailor the best PGE and lungworm control programme for the farm with your vet.

There are several factors to bear in mind when developing the plan:

- Use pasture effectively so that cattle avoid grazing contaminated pasture during the peak season. This can be as simple as moving cattle onto fresh, ungrazed pasture (such as silage aftermath) just before the summer rise in larval numbers
- Reduce routine worming by monitoring faecal egg counts (FEC) and animal growth rates. This will save money and reduce the risk of resistance developing on the farm
- Worm stock susceptible to hibernating larvae at housing

For more information visit COWS website – cattleparasites.org.uk

Plant poisoning

Plants to be aware of

Most plants are not poisonous to cattle, but some plants will cause serious problems if eaten.

Ragwort

High awareness and careful management of pastures mean ragwort poisoning is relatively rare in the UK.

Most often seen in animals that have eaten the wilted/dried plant in hay or silage.

Yew

A common ornamental tree, often found in churchyards. If eaten, it usually leads to rapid death.

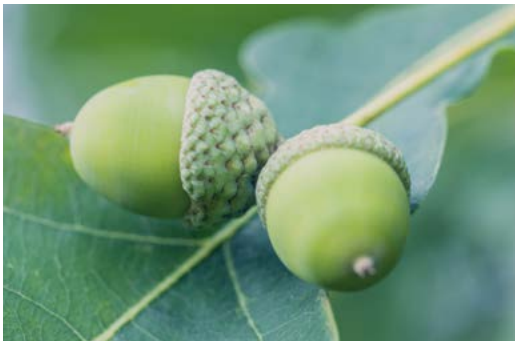
Bracken

Eating bracken over several weeks when pasture is sparse can be fatal to cattle. Death results from bone marrow suppression, causing loss of blood cells and clotting factors.

Ingestion of bracken over many months, particularly when used as bedding material, can lead to tumours in the bladder, oesophagus and rumen.

Acorns

These can present a serious problem on pastures that have oak trees, after autumn storms. Tannins in the acorns cause serious, often fatal, kidney damage.



Remove cattle from pastures with oak trees in the autumn

Water dropwort

Dry, hot weather can drive cattle to graze marginal areas in search of food, where they can find toxic plants they would normally leave alone.

One of the most important is Water dropwort, which is very common in the west and south of England.

Cattle are particularly at risk after ditches have been cleared out, which exposes the poisonous roots, often referred to as ‘dead man’s fingers’.

Costs and implications

Plant poisoning in cattle is usually fatal, with the loss of productive animals and the associated costs of bringing in or rearing replacements.

Risk factors and susceptibility

Pasture management should reduce the risks of plant poisoning as much as possible, e.g. by digging out ragwort, spraying bracken, ensuring a plentiful supply of nutritious grasses.

Early identification

Ragwort

- Chronic weight loss and diarrhoea
- Jaundice
- Accumulation of fluid under the jaw and brisket caused by liver damage

Yew

No early signs. Die very quickly after eating, often found dead.

Bracken

- Weight loss and weakness
- Blood haemorrhaging from the nasal passages and vagina
- Death within several days

Acorns

- Constipation/straining to defecate
- Diarrhoea
- Not eating
- Bloat due to the rumen not working
- Kidney failure
- Death within four to seven days

Water dropwort

- Salivation and dilated pupils
- Breathing difficulty
- Collapse and spasmodic convulsions
- Most affected cattle die

Prevention and control

Ragwort

Control ragwort on pasture by spraying with selective herbicides or by digging out the whole plant.

Yew

Prevent access by cattle by fencing off yew trees and maintaining perimeter fences so they cannot escape.

Bracken

Many hill farms have substantial areas of bracken where fencing, burning or herbicide treatments would be uneconomic. Adequate feeding should ensure cattle do not graze bracken.

Acorns

Remove cattle from pasture where oak trees are present, especially after autumn storms or heavy acorn falls.

Water dropwort

Supplement cattle on bare pastures during drought to prevent them from grazing marginal areas. Move cattle out of fields where ditches have been cleared.

Cattle that eat ragwort, bracken or acorns will suffer excessive weight loss

Long-term ingestion of bracken can be fatal to cattle

Diagnosis and treatment

Ragwort

Diagnosis is based upon clinical evidence of liver disease with known exposure to ragwort.

There is no effective treatment once clinical signs appear. Remove contaminated feed and destroy.

Yew

The cause of death can only be confirmed by examining rumen contents at post-mortem. There is no treatment.

Bracken

Diagnosis is based upon clinical signs such as loss of appetite, bloody diarrhoea and a high temperature. Secondary infection is very common.

In acute cases, treatment with broad-spectrum antibiotics is generally unsuccessful.

Acorns

Diagnosis is based upon clinical signs and exposure to acorns – confirmation by post-mortem.

There is no specific treatment to cure the problem. Supportive treatment includes giving large volumes of intravenous fluids, which are prohibitively expensive.

Water dropwort

Diagnosis is based upon evidence of plants having been grazed or roots exposed by ditching – confirmation by post-mortem.

There is no specific treatment. If poisoning is suspected, remove all cattle from areas where the plant grows.

Respiratory disease (pneumonia)

Respiratory disease in cattle is the result of the interaction between the infectious agent or agents (bacteria, virus or both), the environment and the immune status of the individual animal. The disease can result from primary viral infection or from a secondary bacterial infection that develops after viral damage to the defence mechanisms of the upper respiratory tract. There are also bacteria that cause respiratory disease through primary infection, such as *Mannheimia*, causing 'pasteurellosis', which can be associated with sudden death.

The main viral causes of respiratory disease in cattle are:

- IBR (Infectious Bovine Rhinotracheitis)
- BRSV (Bovine Respiratory Syncytial Virus)
- PI3 (Parainfluenza 3 Virus)

Costs and implications

Respiratory disease is estimated conservatively to cost the UK cattle industry £60m each year.

This is calculated on the basis of £30/head for mild cases, rising to £500/head when the animal dies.

Losses result from mortality and treatment costs, but most importantly from weight loss during illness and often through delayed recovery.

Risk factors and susceptibility

Respiratory disease can affect all ages of cattle but is most commonly seen in younger animals.

Factors that increase the risk of respiratory disease in cattle include the following:

- Poor ventilation and/or draughts in buildings
- Extremes of temperature
- Stress caused by movement, mixing of stock, housing or excessive handling
- General poor management, poor nutrition, poor hygiene

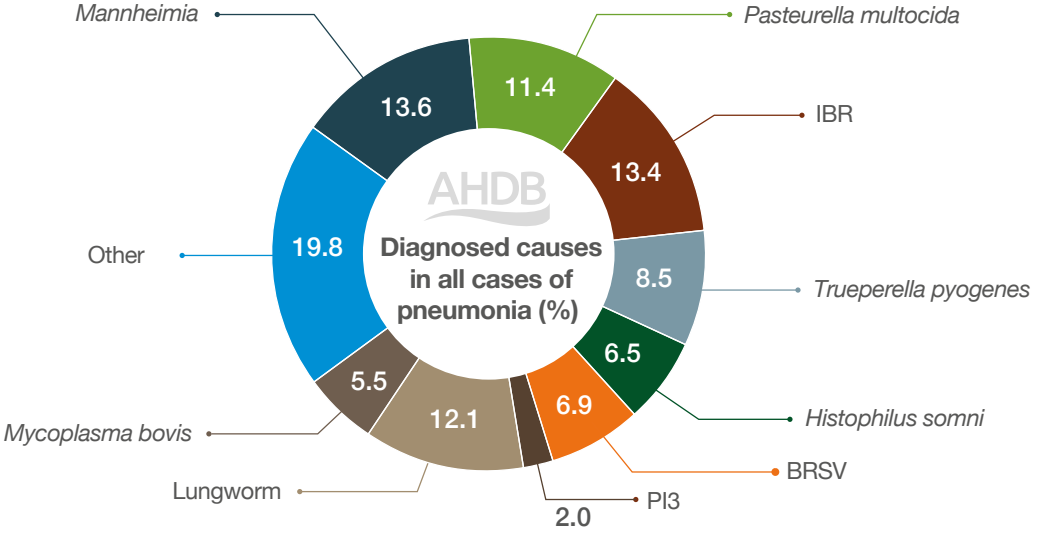


Figure 5. Infectious causes of bovine abortion 2008–2015 as a percentage of all cases where a diagnosis was reached (n=4,813) Source: VIDA report

Early identification

Increased rectal temperature is often the quickest and most accurate method of identifying affected cattle within a group.

Classical clinical signs of respiratory disease:

- Fever of over 40°C (>104°F)
- Difficulty breathing
- Nasal discharge
- Varying degrees of depression
- Reduced or no appetite ('off-feed')
- Rapid, shallow breathing
- Coughing

Prevention and control

Husbandry

Attention to general husbandry is the first important control measure for respiratory disease, especially ensuring building ventilation design provides a suitable environment. Reducing stocking density will usually reduce the disease pressure when an outbreak occurs.

Vaccination

Vaccines are available to prevent IBR and BRSV. All beef units should seek veterinary advice on the strategic use of vaccination as part of their herd health programmes. Laboratory confirmation of cause(s) may be necessary before embarking on a vaccination protocol.

Diagnosis and treatment

Rapid and accurate diagnosis of the cause(s) of respiratory disease is essential so that steps can be taken to prevent further and future incidence.

Selecting cattle for treatment on the basis of raised rectal temperature is often the most cost-effective way to deal with a respiratory disease outbreak. Choice of antibiotic treatment is critical and will be determined by the vet.

As well as antibiotic treatment, it is important to minimise long-term lung damage through the use of anti-inflammatory medicines.

Primary bacterial respiratory disease caused by *Histophilus somni* and *Mycoplasma bovis* is emerging as a major problem in the UK. There are no vaccines currently licensed against these pathogens and good hygiene, and management regarding ventilation and stocking rates are important.

Septicaemia *(blood poisoning)*

Septicaemia is a bacterial infection that threatens beef calves within the first six days of life. Joint ill often develops later in calves that survive the initial infection.

Calves are vulnerable when born into a contaminated environment. Bacteria typically infect the calf via the tonsil, upper airway or gut. Although the navel is not a major entry point for bacteria, local infection will cause navel ill, which may develop into peritonitis (widespread abomasum infection). There is an incubation period of around 24 hours between the first infection and outward signs, and the disease can lead to death within as little as eight hours.

Costs and implications

The loss of young calves will potentially undermine the profitability of any beef enterprise. Therefore, avoidance by ensuring adequate colostrum intake is a highly cost-effective use of time.

Newborn calf infections such as joint ill and navel ill are extremely painful and easily prevented.

Risk factors and susceptibility

The risks of infection are heightened by poor hygiene around calving time and failure to ensure the calf receives adequate colostrum within the first six hours of life.

Insufficient colostrum intake may result from any of the following:

- Small, weak and sickly calves, e.g. premature, twins
- Calves which are weak following a difficult calving
- Cows with insufficient or poor-quality colostrum due to poor nutrition or disease
- Downer cows after calving, e.g. milk fever

Early identification

The following signs are an indication that calves may be infected:

- Calves are initially dull and lethargic
- Calves have failed to suck and cows become anxious (bellowing, udder full with milk)
- Cold extremities
- Salivation and yellow mucoid diarrhoea

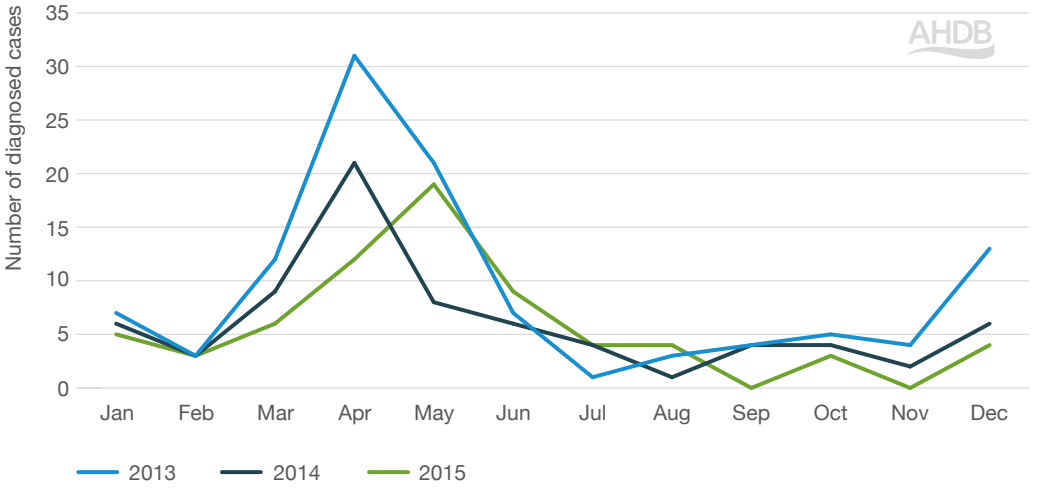


Figure 6. Monthly diagnosed cases of joint ill cattle 2013–2015 Source: VIDA report

Prevention and control

Calves must ingest 10% of their body weight of colostrum (usually about three litres) within the first six hours of life. Otherwise, they are susceptible to infection.

Ensure adequate colostrum intake through:

- Added vigilance around calving time, including a thorough check that newborn calves have sucked well
- Keeping a supply of frozen colostrum for use when necessary. If using colostrum from another cow, be sure she is not a source of other diseases such as Johne's disease. Colostrum should ideally be fed with a bottle and teat in preference to a stomach tube
- The vet may be able to offer tests for passive antibody ingestion (colostrum intake) through the practice laboratory

Strict hygiene around calving is an essential management factor in the control and prevention of septicaemia and associated conditions.

Maintain the highest levels of hygiene by:

- Regularly cleaning out calving boxes and using sufficient clean bedding straw
- Avoiding outdoor calving in potentially wet and muddy conditions
- Fully immersing calves' navels in strong veterinary iodine solution soon after birth and again after four to six hours when checking colostrum intake
- Moving cows and newborn calves away from heavily used calving paddocks as soon as possible

All calves must suck sufficient good-quality colostrum within the first six hours of life

Diagnosis and treatment

Septicaemia can be diagnosed by the vet on clinical examination.

Joint ill appears as a hot, painful, swollen joint(s) with obvious lameness affecting one or more legs. Calves may be unwilling to stand when more than one leg is affected.

Rapid detection and early veterinary attention are vital if treatment is to be effective. Antibiotic therapy will depend on the likely bacterial cause. Anti-inflammatory drugs may also be prescribed.

Skin conditions

Skin conditions are usually caused by ectoparasites. Producers need to identify the specific ectoparasite infection affecting their cattle to treat it appropriately.

The parasites that cause most damage to cattle are lice (pediculosis), sarcoptic mange, psoroptic mange, chorioptic mange, ticks and midges.

There are five species of louse that infest cattle, classified as either biting or sucking.

Sarcoptic and psoroptic mange occur worldwide but are rare in the UK. Since 2007, there have been a few cases of the latter reported in this country, where infestations have been brought in on imported cattle.

Vigilance is important as new cases are occurring in the UK and treatments are not very effective.

Chorioptic mange, caused by infestation with *Chorioptes bovis*, is commonly seen in adult cattle in the UK, towards the end of winter housing.

Ticks (*Ixodes ricinus*) are not a significant problem in this country, although they can act as vectors for the occasional case of redwater (*Babesia* spp.) and tick-borne fever (*Ehrlichia phagocytophila*).

Heavy infestations of lice cause animals to rub themselves to relieve the irritation

Costs and implications

Ectoparasites induce production losses due to reduced or disrupted feeding caused by irritation and damaged hides.

Sarcoptic mange can lead to weight loss, progressing to weakness and incapacity in neglected cattle. It can also be transferred to humans.

Risk factors and susceptibility

Louse populations are highest in cattle kept indoors during winter and those in poor body condition.

Spread occurs by direct contact. The life cycle – egg, three nymph stages and adult – takes three weeks and all stages occur on the host.

Lice on the face of an animal

Early identification

Heavy infestations of lice provoke irritation, causing cattle to rub against fences and feed barriers to scratch themselves, resulting in hair loss, usually over the neck and shoulders.

Manges cause oozing of liquid serum from the blood and thickening of the skin.

Sarcoptic mange thickens over the neck and can cause severe irritations around the anus. In psoroptic mange, the skin thickens over the neck and along the mid-line of the back.

Chorioptic mange infestations characteristically occur at the base of the tail, but infestation may spread to the udder, scrotum and limbs.

Prevention and control

Biosecurity measures should prevent the introduction of parasites on infested cattle.

- Quarantine newly introduced animals
- Check for ectoparasites during quarantine
- Consider treatment of all newly
- introduced animals

Diagnosis and treatment

Careful inspection of the skin using a magnifying glass will identify adult louse populations and eggs sticking to hairs. Further examination under a microscope at x100 will differentiate the particular lice species present.

Mange can be identified via skin scrapings under a microscope.

Chorioptic mange is often observed in female cattle by vets during pregnancy diagnosis.

Treatment using a pour-on synthetic pyrethroid preparation such as deltamethrin will remove all lice.

An injectable Group 3 anthelmintic will remove all sucking lice and more than 98% of biting lice. All cattle in direct contact with each other must be treated.

Treatment for chorioptic mange is rarely necessary as lesions heal spontaneously when cattle are turned out to pasture in the spring.

Further information is available on the COWs website cattleparasites.org.uk/lice-mites-insect-pests

Skin conditions are worse when cattle are housed – but the effects can also be seen when they are turned out to grass

Chorioptic mange at the base of the tail

Mange causes oozing of liquid serum scabs and thickening of the skin

Summer mastitis

Summer mastitis usually occurs in non-lactating cows and heifers during summer. It occasionally appears in the rudimentary udders of young heifers, bulls and steers. There is wide regional variation in incidence across the UK.

In beef cows, summer mastitis is often seen where barren, spring-calving cows are kept for breeding later in the year, i.e. transferred from a spring- to autumn-calving herd.

The disease can be present in beef cows that have stopped lactating before their calf has been removed.

A range of bacteria causes the infection, including *Arcanobacterium pyogenes*, *Peptostreptococcus indolicus* and *Streptococcus dysgalactiae*.

Infection is transmitted by headflies *(Hydrotea irritans)*, which live in bushes and trees. They only fly during mild, humid conditions and in low wind speeds. Cases of summer mastitis tend to be associated with 'problem fields' next to woods and high hedges.

Costs and implications

Loss of an affected quarter of the udder reduces future milk production by around 10%, so the suckling calf will suffer and will not grow as well as expected.

Affected cows may lose up to 100 kg liveweight and generally command poor sale prices when sold.

Risk factors and susceptibility

Cattle are at risk when grazing low-lying fields surrounded by trees or permanent pasture, where more flies tend to hatch. Some animals will also have a higher genetic susceptibility than others and be more likely to suffer.

Early identification

If supervision of maiden and in-calf heifers and dry cows at pasture is sporadic during summer, mastitis can be well-advanced before clinical signs are noted.

During the early stages, there is gradual enlargement both in length and diameter of the teats of the affected quarters before the heifer/cow becomes sick. Often, large numbers of flies cluster around the affected teat opening, causing considerable irritation and the animal will kick frequently.

Obvious swelling accompanies more generalised signs of illness, including isolation from the group, stiffness and reluctance to walk, lack of grazing and rapid loss of body condition.

The affected quarter is swollen, hard, painful and hot. The udder secretion is thick and clotted with foul-smelling green/yellow pus. Affected animals can abort and may die without prompt treatment.

The affected quarter is usually permanently damaged and the cows may give birth to weak calves that often die. Those that survive should be given colostrum from another cow.

Prevention and control

Reduce exposure to flies by grazing cows away from susceptible fields in summer. Move them to higher, more exposed ground, away from clumps of trees or high hedges.

Employ fly control measures (usually synthetic pyrethroids), such as impregnated fly tags, pour-on preparations and sprays.

Dry-cow therapy remains the most effective means of preventing summer mastitis in cows at weaning and in susceptible pregnant heifers.

Discuss the use of long-duration, dry-cow antibiotic preparations with your vet.

Take care to avoid teat damage when infusing intramammary antibiotic preparations in heifers. Cattle should not be tubed in wet weather or unhygienic conditions.

Sealing the teat canal with physical barriers such as micropore/adhesive tape and external teat sealants can be used to good effect.

Remove any affected cows from other cows to prevent the spread of infection.

Diagnosis and treatment

Diagnosis is based on spotting swollen udders as soon as possible.

Veterinary medicines, including antibiotic injections and intramammary tubes, are required to treat the infection.

Stripping the lumpy milk out of the affected quarter should be undertaken as often as is practical but may be resented by the animal due to the pain, so there is a high risk of being kicked.

Best practice

Disease spread

Infectious diseases can be introduced by:

- Diseased animals
- Animals incubating disease
- Apparently healthy animals that have recovered from disease but are now carriers
- Vehicles, equipment, clothing and footwear of people such as vets, contractors, other farmers, salesmen etc., who move between herds
- Feedstuffs, especially those which could be contaminated with faeces
- Contaminated water from surface water, streams and rivers etc
- Manure handling, especially by outside contractors
- Other species such as dogs, cats, wildlife, rodents, birds and insects

Biosecurity principles

Biosecurity control has four major components:

1. Selection
2. Isolation
3. Movement control
4. Sanitation

Selection

Purchase animals from known sources that have a health status equal to, or higher than the existing herd.

- Know the health history of the herds from which cattle are purchased
- Know the health status of animals brought onto the farm
- Never bring in animals without knowing their vaccination history
- Limit purchases to maiden heifers and bulls

Isolation

Strict isolation prevents contact between animals after arrival on farm to reduce the risk of spread of infectious agents.

- Quarantine all new arrivals for at least 30 days
- Cattle must not share community pastures/common grazings
- Cattle must not share fence lines with your cattle or any neighbour's cattle
- Do not use hire bulls from other farms

Movement control

This includes all vehicle, animals and people traffic that could introduce infection onto the farm.

Record all visitors to the farm – both human and domestic animals.

Keep cattle separate between neighbouring farms with double fencing

Sanitation

This addresses the disinfection of materials, people and equipment entering the farm and the cleanliness of the people and equipment on farm.

- Prevent manure contamination of feed and feeding equipment
- Use different equipment to feed and muck out pens or disinfect between use
- Never step in the feed bunker
- Transport animals in clean vehicles only
- Site the lorry-loading area at the perimeter of the farm

Other steps to maintain biosecurity

- Maintain a closed herd wherever possible, using artificial insemination to introduce new genetics.
- Oestrus synchronisation programmes can be very successful in groups of beef cattle, especially heifers
- Control diseases by vaccination
- Maintain perimeter fences
- Do not impulse-buy animals from unknown sources at market or dispersal sales. They may bring new and devastating disease onto the farm

Top 10 herd health tips:

1 Maintain biosecurity – do not buy in disease.

2 Monitor herd health status. Check what diseases are present by blood sampling youngstock.

3 Cull infected animals, e.g. those animals persistently infected with BVD, or carrying IBR or Johne's disease.

4 Control diseases that cannot be eradicated. Vaccination policies save many times their cost.

5 Implement effective treatment protocols where disease cannot be completely prevented. Limit damage by treating the disease as quickly and effectively as possible.

6 Improve management practices, e.g. batch calving, all-in, all-out policies.

7 Improve the environment, e.g. improve ventilation in stock buildings.

8 Record reproductive performance. Beef production starts with the birth of live calves.

9 Record growth rates. Find out if the animals are responding to their feed input.

10 Take a team approach to reducing disease and the costs associated with preventing, managing and treating it. Involve stockmen, vets and other advisors.

Discuss the herd health plan, disease surveillance programme and disease respsonse actions with the vet on a regular basis.

For more information, see ***Using medicines responsibly***, available in hard copy or online at **ahdb.org.uk**

Relevant resources

Publications

Biosecurity advice purchasing checklist
Guide to BVDFree
Managing mastitis guide
Using medicines responsibly

Online resources

Buyers checklist for beef breeding cattle
Buyers checklist for beef calves and store cattle
Hoof care field guide
Webinar: Managing lameness in the suckler herd
Webinar: Optimising fertility and health of the suckler cow post calving

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