

Cattle Diseases

The Farmers' Guide

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Government of South Australia

Department of Primary Industries
and Regions

Cattle Diseases

The Farmers' Guide

Developed by Animal Health Australia and the Department of Primary Industries and Regions, Biosecurity SA, Animal Health.

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How to use this guide

This guide has been designed as a quick-reference tool to help farmers take action when faced with a broad range of cattle diseases and conditions on farm. It will help you assess signs and symptoms and identify possible causes of disease. It provides information on diagnosis, treatment options, prevention and general cattle health management.

Printed and digital resources are referenced throughout to assist you with more detailed information on a number of cattle diseases, conditions and best practice guidelines.

You will also find a list of useful contacts and websites on the back cover.



Reporting serious or unusual animal disease signs

Always keep an eye out for serious or unusual signs and symptoms in livestock including:

- unexplained deaths
- sores or ulcers on feet or inside mouth (this may result in a reluctance to eat or move)
- excessive salivation (drooling should always be treated suspiciously)
- reduction in milk yield from cows and eggs from chickens
- diarrhoea, especially if it has blood in it
- excessive nasal discharge (unless you know what has caused it)
- staggering, head drooping or severe lameness, especially if more than one animal at the same time.

Serious animal diseases must be reported. Early reporting provides the best chance to contain and manage an outbreak before it spreads. If you notice any serious or unusual signs or symptoms with your animals, you can:

- call the 24-hour Emergency Animal Disease Hotline on 1800 675 888
- contact your local Department of Primary Industries and Regions (PIRSA) Animal Health office ([see back cover](#) for phone numbers)
- contact your local veterinarian.

Funding for disease investigations

Subsidies are available to support private veterinary investigations into animal diseases where an infectious agent is a potential cause. This is to help producers maintain and demonstrate South Australia's highly regarded animal health status.

The program covers all livestock species, companion animals, and wildlife (including feral animals) and is aimed primarily at early detection and diagnosis of emergency animal diseases.

For further information, contact your local veterinarian, who may access these funds through PIRSA.



Scan QR code to learn more
about disease surveillance
or visit [www.pir.sa.gov.au/
livestock-disease-surveillance](http://www.pir.sa.gov.au/livestock-disease-surveillance)



Key to disease diagnoses by signs and symptoms

Abortions/stillbirth

- Bovine viral diarrhoea virus (pestivirus)
- Leptospirosis
- Theileriosis
- Nitrate – Nitrite poisoning
- Vibriosis (around 6 months of pregnancy)
- Foot and mouth disease (FMD)*
- Lumpy skin disease (LSD)*

Anaemia

- Theileriosis
- Copper deficiency
- Cobalt deficiency
- Internal parasites

Anorexia (not eating)

- Acidosis
- Pyrrolizidine alkaloids toxicity
- Gastrointestinal blockage
- FMD *
- LSD *

Blindness

- Lead poisoning
- Polioencephalomalacia
- Malignant catarrhal fever
- Metabolic diseases

Convulsions

- Enterotoxaemia
- Grass tetany
- Perennial ryegrass toxicity
- Annual ryegrass toxicity
- Nitrite poisoning
- Lead poisoning
- Polioencephalomalacia

Coughing

- Bovine herpesvirus - 1
- Bovine respiratory disease
- Lung worm (calves)

Diarrhoea

- Acidosis
- Bovine viral diarrhoea virus (pestivirus)
- Johne's disease
- Coccidiosis, internal parasites
- Dietary causes
- Cobalt deficiency (scours in calves)
- Selenium deficiency

Fever

- Bovine viral diarrhoea virus (pestivirus)
- Hardware disease
- Leptospirosis
- Malignant catarrhal fever
- FMD *
- LSD *

Ill thrift

- Bovine viral diarrhoea virus (pestivirus)
- Johne's disease
- Hardware disease
- Theileriosis
- Copper deficiency
- Cobalt deficiency
- Selenium deficiency
- Intestinal worms
- LSD *

*Emergency Animal Disease – contact your local PIRSA Animal Health office for advice immediately or report to the Emergency Animal Disease Hotline on 1800 675 888.

Key to disease diagnoses by signs and symptoms

Infertility

- Papillomatosis if present on penis/prepuce or udders and vulvas
- Pestivirus

Jaundice

- Leptospirosis
- Toxic plants

Lameness

- Black leg & malignant oedema
- Foot abscess
- Grass tetany
- Physical injury
- FMD *

Nasal and ocular discharge

- Bovine Herpesvirus – 1
- Bovine viral diarrhoea virus (pestivirus) (nasal)
- Eye cancer (ocular only)
- Pink eye (ocular only)
- Malignant catarrhal fever
- Respiratory disease
- FMD *

Respiratory issues

- Bloat
- Bovine respiratory disease ('shipping fever')
- Nitrite poisoning
- Lung worm
- FMD *

Salivation

- Actinobacillosis
- Botulism
- Bovine herpesvirus – 1
- Bovine Respiratory Disease
- Grass tetany
- Heat stress
- FMD *
- Grass seeds
- Lupinosis
- Pyrrolizidine alkaloid poisoning

Sudden death

- Anthrax *
- Poisoning (e.g. plant/chemical/snake)
- Grass tetany, milk fever
- Clostridial diseases
- Lightning strike
- Pregnancy toxæmia
- Heat stroke
- Acute pneumonia
- Calving issues/prolapses

Weight loss

- Acetonemia
- Actinobacillosis (wooden tongue)
- Johne's disease
- Coccidiosis (black scours)
- FMD *
- LSD *

*Emergency Animal Disease – contact your local PIRSA Animal Health office for advice immediately or report to the Emergency Animal Disease Hotline on 1800 675 888.

Key to disease diagnoses by season

Spring Sept/Oct/Nov	Summer Dec/Jan/Feb	Autumn March/April/May	Winter June/July/August
<ul style="list-style-type: none">• Coccidiosis• Nutritional diarrhoea• Intestinal worms• Polioencephomalacia• Grass tetany• Annual ryegrass toxicity	<ul style="list-style-type: none">• Actinobacillosis (wooden tongue) from dry feeds• Botulism (chewing on bones due to protein and phosphorus deficiencies)• Perennial ryegrass toxicity• Pyrrolizidine alkaloids toxicity• Annual ryegrass toxicity	<ul style="list-style-type: none">• Botulism (chewing on bones due to protein and phosphorus deficiencies)• Perennial ryegrass toxicity• Polioencephomalacia• Soursob poisoning	<ul style="list-style-type: none">• Coccidiosis (black scours)• Diarrhoea• Grass tetany• Lice

Key to disease diagnosis by poisoning/toxicity

Nitrate poisoning

- Cape weed
(*Arctotheca calendula*)
- Oats
(*Avena sativa*)
- Canola
(*Brassica napus*)
- Wild turnip
(*Brassica rapa*)

Perennial ryegrass staggers

- Perennial ryegrass
(*Lolium perenne*)

Phalaris poisoning

- Phalaris
(*Phalaris aquatica*)

Phalaris staggers

- Phalaris
(*Phalaris aquatica*)

Photosensitisation

- Salvation Jane/
Paterson's curse
(*Echium plantagineum*)
- Heliotrope/Potato weed
(*Heliotropium europaeum*)
- Caltrop
(*Tribulus terrestris*)
- St John's wort
(*Hypericum perforatum*)
- Buckwheat
(*Polygonum fagopyrum*)
- Hairy panic
(*Panicum effusum*)
- Sweet grass
(*Panicum laevifolium*)
- Lantan
(*Lantana camara*)
- Fungus of facial eczema
(*Pithomyces chartarum*)
- Fungus of lupinosis
(*Phomopsis leptostromiformis*)
- Blue-green algae
(*Anacystis cyanea*)

Pyrrolizidine alkaloid poisoning

- Salvation Jane/
Paterson's curse
(*Echium plantagineum*)
- Heliotrope/Potato weed
(*Heliotropium europaeum*)
- Caltrop
(*Tribulus terrestris*)

Sudden death

- Cape tulip
(*Moraea flaccida*)
- Lupinosis
(*Lupinus angustifolius*
and *Lupinus albus*)

Exotic diseases



Exotic diseases

Exotic diseases don't always look spectacular. They often look the same as common diseases seen every day on South Australian farms.

Help protect the future of our livestock industry by seeking veterinary assistance as soon as you notice a problem and report your concerns immediately to the **Emergency Animal Disease Hotline on 1800 675 888**.

Foot and mouth disease

Foot and mouth disease (FMD) is a serious exotic disease (virus) spread through direct contact with an infected animal or object, causing fever, lesions to develop on the mouth, tongue, lips and between hooves, increased salivation.

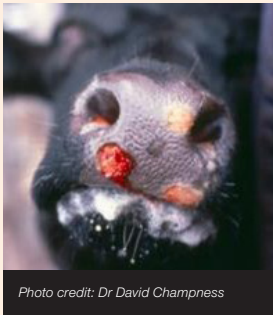


Photo credit: Dr David Champness



Oral lesions and increased salivation commonly seen in cattle with pestivirus, malignant catarrhal fever, actinobacillosis (left) compared to a cow with foot and mouth disease (right).

Lumpy skin disease

Lumpy skin disease (LSD) is a serious exotic disease (virus) spread by biting flies and insects, causes high fever, depression, scabs that can leave holes allowing for infections, watery eyes and increase nasal and salivary secretions.

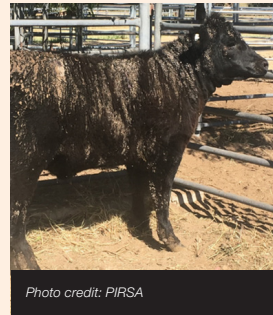


Photo credit: PIRSA



Photo credit: Department of Agriculture, Fisheries and Forestry

Serious skin disease (Dermatophilus) (left) compared to a cow with lumpy skin disease (right).

Anthrax

Emergency animal disease,
notifiable and zoonotic

If you suspect your livestock may have anthrax, contact your local PIRSA Animal Health office immediately or report to the Emergency Animal Disease Hotline on 1800 675 888.

Problem

Anthrax has not been diagnosed in SA for many years, but the risk of an outbreak is heightened with occasional detections in NSW and Victoria as well as isolated outbreaks in WA and Queensland.

Anthrax is caused by a bacterium that affects many species including cattle, sheep, goats and humans. The bacterium produces spores when exposed to air that persist in soil for many years. The disease is spread by contact with infected animals or by feed and water that have been contaminated with anthrax spores. An outbreak could be a possible cause of unexplained sudden death in livestock and can affect trading opportunities locally and internationally. More common in summer but can occur all year round.

Humans can contract anthrax if they handle infected animals, carcasses, animal products and wool. Take extreme care when handling animals suspected of dying from anthrax. If you suspect you have been exposed to anthrax, contact your medical practitioner immediately.

Signs and symptoms

- Sudden death usually first sign, preceded by rapidly worsening weakness and staggering.
- Bloody or tarry discharge seen at mouth, nose or anus of dead animals.
- Sudden drop in milk production, red-stained milk or urine.



Image supplied by Dr Bruce Watt

Sudden death and blood from orifices are common signs of anthrax in cattle.

Anthrax (cont.)

Diagnosis

- If unexplained sudden death occurs and anthrax is suspected do not open or move the carcass. To prevent spread of disease and human exposure it is critically important the animal is tested for anthrax before they are moved. Seek advice from your local veterinarian or call Emergency Animal Disease Hotline on 1800 675 888 immediately.
- Diagnosis is most likely in animals that have recently moved from eastern states.
- A lack of rigor mortis, with rapid decomposition of carcass. Pulpy kidney is often assumed to be the cause.
- PIRSA animal health officers can diagnose with a quick 'penside' test that can usually detect or dismiss anthrax in minutes.

Treatment

- Treatment is rarely possible as affected animals die quickly.
- High doses of penicillin (under veterinary supervision) may be effective in early cases, but may interfere with anthrax vaccine.

Prevention

- Vaccination is effective, full protection takes 10–14 days to develop after administration.
- Vaccination may only occur with the approval of SA's Chief Veterinary Officer (Chief Inspector of Stock).

Foot and mouth disease (FMD)

Emergency animal disease,
notifiable

If you suspect your livestock may have foot and mouth disease, contact your local PIRSA Animal Health office immediately or report to the Emergency Animal Disease Hotline on 1800 675 888.

Problem

Australia is free of foot and mouth disease (FMD). It is a highly contagious animal disease that affects cattle, sheep, goats, pigs, deer and camelids (all cloven-hoofed animals). An incursion of the virus would have severe consequences for Australia's animal health and livestock trade.

FMD is carried by live animals and in meat and dairy products, as well as in soil, bones, untreated hides, and vehicles and equipment used with infected animals. It can also be carried on people's clothing and footwear.

Signs and symptoms

- Fever.
- Drooling (salivation).
- Reluctance to move.
- Blisters inside mouth, on lips and tongue, between and above hooves on the feet — blisters may be intact or ruptured, exposing raw, painful tissue.

Diagnosis

- Report these signs immediately to your veterinarian or the Emergency Animal Disease Hotline on 1800 675 888.
- Samples will be collected from your animals and will be sent urgently to an appropriate animal health laboratory for diagnostic testing.



Cow with tongue lesion.

Foot and mouth disease (cont.)

Treatment

- No effective treatment for FMD.
- Australia has detailed, well rehearsed FMD response plans and arrangements in place should an outbreak occur.

Prevention

- Transmission — FMD virus is carried by live animals and in meat and dairy products, as well as in soil, bones, untreated hides, vehicles and equipment used with infected animals. It can also be carried on people's clothing and footwear.
- Farm biosecurity — practice good farm biosecurity at all times to prevent your animals being exposed to FMD.
- For more information on farm biosecurity practices visit www.onebiosecurity.pir.sa.gov.au and www.farmbiosecurity.com.au



Cow with heel lesion.



Scan QR code to learn more about FMD or visit www.pir.sa.gov.au/fmd

Lumpy skin disease (LSD)

Emergency animal disease,
notifiable

If you suspect your livestock may have lumpy skin disease, contact your local PIRSA Animal Health office immediately or report to the Emergency Animal Disease Hotline on 1800 675 888.

Problem

A viral disease of cattle and water buffalo that causes relatively few deaths, however, the disease can result in animal welfare issues and significant production losses. LSD does not pose a risk to human health.

An incursion of LSD would have significant consequences for our beef, water buffalo, and dairy cattle industries. If Australia was no longer recognised as being LDS-free, there would be substantial trade impacts and severe economic losses to Australia's meat processing sector.

Signs and symptoms

- Discharge from the eyes and nose.
- Nodules (lumps) of 2–5 cm in diameter on the head, neck, limbs, udder, genitalia and perineum within 48 hours of fever onset. Lesions can vary from few in mild cases to many covering entire body in severely affected animals.
- Reduced milk yield.
- Abortions in pregnant animals.
- Weight loss and ill thrift, depression.



Photo credit: Department of Agriculture, Fisheries and Forestry

A cow after the scabs have fallen off leaving large holes in the hide.

Lumpy skin disease (cont.)

Diagnosis

- Report these signs immediately to your veterinarian or the Emergency Animal Disease Hotline on 1800 675 888
- Samples will be collected from your animals and will be sent urgently to an appropriate animal health laboratory for diagnostic testing.

Treatment

- No effective treatment for LSD.
- Australia has detailed, well-rehearsed LSD response plans and arrangements in place should an outbreak occur.



Photo credit: Michel Bellaiche

A cow showing raised nodules on its hide which is a typical sign of infection with LSD.

Prevention

- Transmission — LSD virus is spread by biting insects including certain species of flies, mosquitoes and possibly ticks. It can also be spread by movement of infected animals or contaminated products and equipment.
- Farm biosecurity — practice good farm biosecurity at all times to prevent animals being exposed to LSD.
- For more information on farm biosecurity practices visit www.onebiosecurity.pir.sa.gov.au and www.farmbiosecurity.com.au.



Scan QR code to learn more about LSD or visit www.pir.sa.gov.au/lumpy-skin-disease

Cattle diseases & conditions



Abscess

Problem

Damaged and infected body tissue from abrasions or skin penetrations (thorns, sharp objects during feeding or rubbing, improper injection technique) causing a swelling response and pus accumulation surrounded by thick fibrous capsule. This can occur in all areas of the body.

Signs and symptoms

- Initially the area may become red, swell, and cause pain.
- Tight, raised surface of the skin, appears swollen.
- If abscess has popped, oozing white, yellow, or bloody liquid.

Diagnosis

- Clinical signs.
- History of penetrating wound or injections that may have introduced bacteria.

Treatment

- Management — some resolve on their own.
- Veterinary treatment — draining the abscess is usually required and antibiotics may be used.

Prevention

- Diet — reduce use of coarse or seed filled feeds.
- Management — proper injection technique.



Abscess above eye.



Shoulder abscess.

Acidosis (grain overload, lactic acidosis, rumen acidosis)

Problem

A sudden change in diet to high concentrate (rapidly fermentable) grains builds lactic acid in the gut, which can cause organ damage. Severely affected cattle die within 24 hours, others recover slowly but are often chronically lame.

Signs and symptoms

Disease presentation depends on severity and predicts outcome.

- **Mild:** stop eating, appear quiet, diarrhoea.
- **Moderate:** pale and smelly scour, rumen contractions stop, bloating, marked dehydration, laminitis.
- **Severe:** laying on side, not able to rise, death usually occurs within 24 hours.

Diagnosis

- History of sudden change in a feed or being fed high-concentrate diet.
- Animals in intensive systems.

Treatment

- Supplementation — provide high quality hay for mildly affected animals.
- Veterinary treatment — options include intravenous fluids, drenching with bicarbonate solution, thiamine or steroid injections, sometimes antibiotics.
- Humane destruction — severely affected animals should be humanely euthanised ([see page 70](#))

Prevention

- Diet — avoid sudden changes to diet, gradually change feeds (over 2-3 weeks) to allow digestive microbiome to adapt.
- Diet — provide cattle with sufficient roughage of 5-10cm length.



First stomach full of grain.

Acetonaemia (ketosis, fatty liver)

Problem

Insufficient energy from feed deprivation or inadequate feed (especially in pregnant animals – see Pregnancy toxoemia, page 54) or inappetence from stress or disease (displaced abomasum, metritis or lameness) causes low blood sugar that results in fat breakdown by the liver creating ketones. Can result in death. Cattle that are old, fat, pregnant or lactating are at a higher risk.

Signs and symptoms

- Inappetence, lethargy, weight loss, and reduced abdominal size.
- Loss of skin fat — dull appearance of skin.
- Drop in production.
- Nervous signs including incessant chewing and licking in lactating cattle.
- Breath smells sweet.

Diagnosis

- Ketones in urine or milk from dipstick test.

Treatment

- Management and diet — isolate suspected cases, give good quality hay to stimulate appetite and provide energy.
- Veterinary care — includes drenching with propylene glycol or glycerol, giving calcium borogluconate under the skin, and glucocorticosteroids only in lactating cattle.
- Veterinary care — treat concurrent diseases.

Prevention

- Management — early detection of cattle with ketosis is the best approach.
- Diet — minimise periods of feed deprivation, rapid diet changes, and avoid unpalatable or low energy feeds.
- Management — avoid over condition at calving.



Photo credit: Associate professor David Beggs

Starvation from ketosis.

Actinobacillosis (wooden tongue)

Problem

Open cuts become infected by the bacteria *Actinobacillus ligniersii* resulting in inflammation of the tongue. The tongue becomes hard and stiff, causing issues with consuming food and water.

Signs and symptoms

- Increased salivation, tongue may protrude from mouth.
- Tongue is firm and immovable with swellings.
- Visual observations of ulcers.
- Weight or production losses from inability to properly eat.

Diagnosis

- Clinical signs (ulcers on tongue, face swelling of lower jaw and around lymph nodes).
- Pus smear from the lesion for confirmation.

Treatment

- Diet — use of a soft feed to help reduce pain and increase ability to eat.
- Veterinary care — includes administration of sodium iodide and/or antibiotics.

Prevention

- Management and environment — isolation of affected animals from herd, disinfection of shared feed and water locations.
- Diet — limit exposure to coarse foods.
- Woody tongue is often unpredictable and infrequent so knowledge of disease for rapid response is more important than prevention.



Stiff and swollen tongue.



Oral lesions associated with wooden tongue.

Bloat

Problem

Distention of the abdomen from excess gas in the rumen, which can compress the respiratory system causing asphyxiation or heart failure. Frothy bloat is caused by rapid intake of high protein foods (legume pastures, fine ground grains), where the gas can't be eructated (burping) as it is trapped in layer of foam. Free gas bloat is caused by an obstruction or functional problem preventing normal eructation of rumen gas.

Signs and symptoms

- Multiple animals in herd have distended left flank, right flank affected in severe cases.
- Signs of troubled breathing (mouth breathing, tongue protrusion, extended neck) In advanced cases the animal will “go down”, followed by death

Diagnosis

- Clinical signs.
- History — gorging on feed, feed without roughage.

Treatment

- An oral anti-bloat can be used for early to mild cases.
- Veterinary care — a stomach tube can be inserted to relieve gas build up for more moderately affected animals
- Veterinary care — in severe cases, wide-bore trochar is used to perforate the rumen wall across the dorsal left flank and allow gasses to escape from via the hollow needle.

Prevention

- Diet — restrict grazing time on high protein pastures.
- Diet — feed cattle large amount of dry matter (hay) prior to high protein pastures exposure.
- Management — use anti-bloat preparations (drench, bloat oil in water supply, provide licks/blocks).



Photo credit: Dr Bruce Watt

Bloat death.



Photo credit: Dr Bruce Watt

Distended left flank from bloat.

Botulism

Problem

Ingestion of toxins from the bacteria *Clostridium botulinum* from contaminated feeds (carrion carcasses or decaying feed matter) or from chewing on bones, affecting nerve function and can result in paralysis.

Signs and symptoms

- Muscle weakness, incoordination, or animal going down.
- Protruding tongue and loose jaw (not clenched) with excessive salivation.
- Animals often first present with a hunched-up appearance and strain to defecate.
- Unable to eat or drink.

Diagnosis

- Herd history and clinical signs (high fatality or sickness in herd).
- 2–6 days after eating contaminated feed, symptoms can develop within 12–24hrs for high doses and 7–20 days in lower doses.
- Feed sample for bacteria or vermin contamination confirmed at a veterinary laboratory (most reliable test method).

Treatment

- No specific treatment nor antitoxin available. Toxin must run its course.
- Management and environment — supportive care through maintaining access to water, food, cool environment (shade).
- Diet — suspected feeds and or water should be replaced.
- Humane destruction — severely affected animals should be humanely euthanised (see page 70).

Prevention

- Vaccination — vaccines available. Can vaccinate herds with longer acting vaccine in endemic areas, and shorter duration vaccines for areas with lower exposure occurrences.

Bovine herpesvirus – 1

Problem

Bovine herpesvirus - 1 (BHV-1) is a common, highly contagious viral infection contributing to respiratory disease complex. BHV-1 spreads through the herd via direct contact with infected body fluids (coughing, sharing feed and water troughs). Infection is lifelong, but disease symptoms flare up only during periods of stress.

Signs and symptoms

- Clear discharge from both eyes considered early sign.
- Mild/severe coughing, nasal discharge, and salivation.
- Severe cases will have thick sticky white from eyes and nose and ulcers on muzzle.
- Opportunistic secondary infection can vary in their presentation, causing pneumonia.
- Abortion strain is NOT present in Australia.

Diagnosis

- Herd history, previous known cases in herd.
- Nasal swab for virus isolation sent to a veterinary laboratory for confirmation.

Treatment

- Treatment is rarely required with recovery occurring within 1–2 weeks.
- Veterinary care — In severe cases or if secondary infection occurs from weakened immune response, antibiotics may be required.

Prevention

- Vaccination — vaccinate herd to minimise disease.
- Management — avoid overcrowding and reduce stress in herd.
- Veterinary care — use of glucocorticosteroids can be used to reduce the spread and severity.



Nasal discharge.

Bovine respiratory disease (BRD, ‘shipping fever’)

Problem

Bovine respiratory disease (BRD) is the term used to describe general respiratory disease in cattle.

It can be caused through combination of stress (recent weaning, transport, injury, dehydration, handling, feed and water change etc) and concurrent infection (viruses or bacteria) to the respiratory tract.

Signs and symptoms

- Lethargy, depression, and dullness.
- Extended head and neck to aid breathing, droopy ears, discharges from eyes, nose, and drooling.
- Coughing and rapid or laboured breathing.
- Some found dead without apparent ante-mortem signs.

Diagnosis

- Nasal swabs sent to a veterinary laboratory to determine the causative pathogens.
- Postmortem — examine consolidated lung lobes.

Treatment

- Veterinary care — systemic antibiotics and non-steroidal anti-inflammatory drugs.
- Treatment — administer injectable Vitamin C.
- Management and environment — isolate affected cattle, protect them from extreme conditions and provide them with water and feed.

Prevention

- Management and environment — minimize stress on cattle, and risk of exposure and transmission of pathogens.
- Diet — supply good quality feed and water and avoid rapid change in diet.
- Vaccination — vaccinate against specific pathogens causing BRD are commercially available.



Nasal discharge from BRD.

Bovine viral diarrhoea virus (pestivirus)

Problem

Bovine viral diarrhoea is a viral infection that is passed on through close contact (nose-to-nose transmission, manure contamination) that causes a wide range of symptoms. Infection can result in immunity or persistently infected (PI) cows. PI cattle pose risks to other animals in the herd, as they are a persistent shedder of virus. Infection of another BVDV strain in PI cattle may lead to mucosal disease (MD), which can be severe and fatal.

Signs and symptoms

- Diarrhoea or abortion outbreak in recently mixed cattle.
- Fever, nasal and ocular discharge.
- Ulceration of the oral mucosa, coronary band, and interdigital cleft.
- Some PIs are significantly stunted within the mob but can appear otherwise normal.
- Unusual syndrome of scours or respiratory illness in housed calves.

Diagnosis

- History and clinical signs — recent introduction of cattle of unknown BVDV status.
- Blood sample, milk sample or tissue (ear notch) sample sent to a veterinary laboratory for confirmation.

Treatment

- Management — other short-term infected cattle will usually recover, they might need to be monitored for respiratory diseases like pneumonia.
- Humane destruction — PI and MD calves should be humanely euthanized ([see page 70](#)).

Prevention

- Vaccinations — vaccines are available, but more widely used in breeding herd before joining.
- Management — avoid mixing susceptible cattle, especially when their BVDV status is unknown.
- Management — introducing PI cattle to healthy, non-pregnant cows is sometimes used to immunize the herd, but individual animal's exposure is unknown.

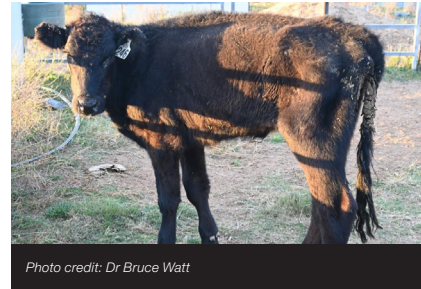


Photo credit: Dr Bruce Watt

Calf infected with Pestivirus.

Bovine Johne's disease (BJD)

Problem

The bacterium *Mycobacterium avium* spp *paratuberculosis* infects the intestines causing chronic inflammation leading to thickening of the intestinal wall, preventing absorption of nutrients. Contamination can occur from the environment and feeding equipment with faecal matter, or be spread from cow to calf.

Signs and symptoms

- Infected cattle show no signs for a long period of time (years) until significant intestinal effect occurs.
- Weight loss, drop in production, profuse watery diarrhoea at end stage. Cattle are still eating well.
- Unresponsive or unexplained wasting and death.

Diagnosis

- Serum and faecal samples to detect presence of bacteria.
- Post-mortem — intestinal tissue sample.

Treatment

- BJD is untreatable.

Prevention

- Vaccination — a vaccine is available to reduce prevalence in an infected herd.
- Management and environment — avoid exposure of susceptible cattle (especially those less than 12 months of age) to infected livestock.
- Buying cattle with high assurance for JD (e.g. a high Johne's Beef Assurance Score) and a National Cattle Health Declaration.



Photo credit: Dr David Champness

Johne's disease wasting.

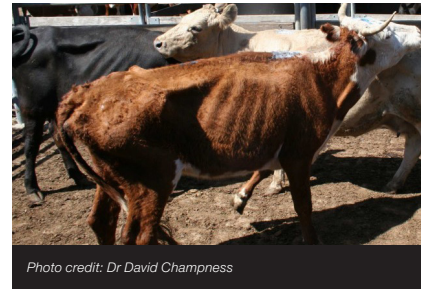


Photo credit: Dr David Champness

Johne's disease wasting.

Clostridial disease (enterotoxaemia)

Problem

Proliferation of *Clostridium perfringens* (a normal gut bacteria) releasing toxins into the small intestine can be triggered by excessive carbohydrate consumption, acidosis, and disturbances in the flow of ingesta through the rumen and small intestine.

Signs and symptoms

- Convulsions, head arched back over the body, head pressing, become recumbent and paddle.
- Profuse watery diarrhoea (less common in cattle)
- Found dead or die rapidly.

Diagnosis

- History and clinical signs — sudden death, nervous signs.
- Post-mortem — intestinal tissue and content.

Treatment

- No effective treatment.
- Veterinary care — other susceptible cattle within the same paddock may be vaccinated and treated with antibiotics and non-steroidal anti-inflammatory drugs.

Prevention

- Vaccination — vaccines are available for some strains.
- Diet — management of feeding regimes to avoid *Clostridium perfringens* proliferation in the rumen/small intestine.

Cobalt deficiency

Problem

Insufficient cobalt in diet (low levels in soil/plants, feed). Winter rainfall leaches cobalt from the soil, followed by high growth rate in spring diluting the amount of cobalt in plants. Worm burdens in cattle increases the loss of cobalt.

Signs and symptoms

- Reduced appetite and ill-thrift, sometimes causing pica.
- Anaemia, scaly ears, rough, pale coat, and reduced milk production.
- Scouring in calves.

Diagnosis

- Blood tests for cobalt level.
- Post-mortem.
- Measurement of cobalt levels in pasture.

Treatment

- Veterinary care — vitamin B12 injections provide the most rapid relief and last for 6-8 weeks.
- Management — cobalt licks, though intake is highly variable; oral drench would only last 2 weeks, cobalt bullets or pasture / water supplements

Prevention

- Diet — ensure quality feed or supplements is provided following winter rainfall.
- Management — drench to avoid high worm burdens, ensure adequate cobalt levels in diet.

Coccidiosis (black scours)

Problem

Coccidia is a parasite that infects the intestinal tract causing damage to the mucosal surface, can worsen by stress or concurrent diseases. Coccidia is highly resistant in the environment and shed in faeces. Infection occurs through ingestion of infectious oocysts in contaminated feed, water, environment.

Signs and symptoms

- Yellow, brown to black diarrhoea, may be stained with blood.
- Straining to urinate or defecate — arched back, elevated tail.
- Reduced appetite, dehydration, and weight/condition loss.

Diagnosis

- Faecal sample sent to a veterinary laboratory for identification of oocysts.

Treatment

- Veterinary care — involving administration of sulphadimidine through injection or drench.

Prevention

- Diet — provide feed and water off the ground to minimize contamination.
- Diet — include sulphadimidine or ionophore like monensin, lasolocid in feeds.
- Management and environment — rotation of paddock between species may reduce build-up of oocysts.



Photo credit: Dr. Bruce Watt

External dried bloody faeces.



Photo credit: Dr. Bruce Watt

Sunken eyes indicating dehydration prior to death.

Copper deficiency

Problem

Insufficient copper in diet (low levels in soil/plants, feed), or excessive intake of molybdenum and sulphur in pasture or feed supplements.

Signs and symptoms

- Loss of pigment in hair.
- Ataxia, falling, reduced growth, diarrhoea, and anaemia.

Diagnosis

- Measurement of copper levels in pasture or feed may be indicative.
- Liver biopsy or liver tissue sample from post-mortem sent to a veterinary laboratory for confirmation.

Treatment

- Veterinary care — copper supplementation via oral drench, injection, in licks, feed, and water. Avoid overdosing.
- Diet — provide good quality feed (Lucerne hay) will contain copper.

Prevention

- Management — ensure quality feed or supplements is provided in areas where the soil has low availability of copper.



Loss of pigment in hair associated with copper deficiency.

Diarrhoea (neonatal)

Problem

Neonatal calf diarrhoea occurs in calves between <6 weeks to 4 months, caused by the environment (faecal contamination of feed and water sources) in combination with calf immunity (reduced colostrum intake) and disease/bacteria (*E. coli*, rotavirus, coronavirus, salmonella, cryptosporidium, pestivirus). Can result in death and if animals survive can have reduction in growth rate.

Signs and symptoms

- Diarrhoea — staining on the tail, down the back legs.
- Dullness, lethargy.
- Sunken eyes and dry nose from dehydration.
- Slow milk feeding reduced, or absence suckle reflex.

Diagnosis

- Clinical signs,
- Faecal sample sent to a veterinary laboratory to identify pathogens and direct treatment options.

Treatment

- Veterinary care — involving fluids and electrolytes to treat or prevent dehydration, systemic antibiotics are used based on the offending pathogen.
- Diet — milk feeding should not be ceased, as it contains essential nutritional value.
- Environment — clean, fresh water should be readily accessible for the calf.

Prevention

- Management — avoid contact or mixing of calves with other animals that may be reservoirs.
- Vaccinations — colostrum vaccines are available to cows, which ensure specific antibodies in colostrum to be fed to the calf.
- Diet — important for calves to receive adequate colostrum in the first 24 hours of life.
- Management — good hygiene when handling calves.

Diarrhoea (older calves)

Problem

Diarrhoea in older calves can be caused by the environment (faecal contamination of feed and water sources), calf immunity and disease and bacteria (*Coccidia*, *Yersinia*, gastrointestinal worms). Can result in death and if animals survive can have a reduction in growth rate.

Signs and symptoms

- Diarrhoea — staining on the tail, down the back legs.
- Depression, lethargy, and dehydration.
- Poor growth and ill-thrift.

Diagnosis

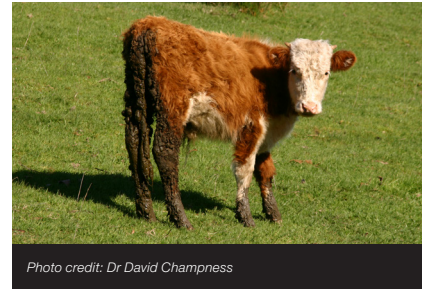
- Clinical signs.
- Blood and faecal sample sent to a veterinary laboratory to identify pathogens and direct treatment options.

Treatment

- Veterinary care — involving fluids and electrolytes to treat or prevent dehydration.
- Veterinary care — systemic antibiotics for specific bacteria & anti-parasitic drenches for worms.
- Management — separate healthy and sick calves to reduce spread of the diseases.

Prevention

- Diet — provide adequate nutrition.
- Management and environment — proper pasture management like paddock rotation and avoid using the same paddock for calving.
- Veterinary care — perform routine faecal egg count with gastrointestinal worms.



Diarrhoea.

Diarrhoea (adult)

Problem

Adult diarrhoea can be caused by nutritional (rapid dietary changes, ruminal acidosis), infectious agents (salmonellosis, clostridial disease, bovine viral diarrhoea virus, coccidiosis, Johne's disease and intestinal worms) preventing intestinal fluids from being absorbed effectively, which passes through the animal resulting in production losses.

Signs and symptoms

- Diarrhoea — staining on tail and back legs.
- Abdominal pain, straining, dehydration, loss of body condition, fever

Diagnosis

- Clinical signs.
- Blood and faecal sample for culture, egg counts etc. sent to a veterinary laboratory.
- Rumen fluid analysis to check for acidosis.

Treatment

- Diet — replace concentrates with roughage to maintain appetite.
- Veterinary care — involving fluid therapy (+electrolytes), non-steroidal anti-inflammatory drugs and systemic antibiotics based on severity.
- Veterinary care — alkalisers for ruminal acidosis & anthelmintics for parasitism.

Prevention

- Depends on the disease diagnosis.
- Diet — provide sufficient dietary fibre.
- Environment — reduce contamination in feed, water, and the environment.
- Management — pasture management to reduce residue in paddocks.

Eye cancer

Problem

Eye cancer is the most common malignant tumour in cattle that can form on the surface of the eye, eyelid or third eyelid. Commonly seen in Hereford and Friesian breeds, cows with protruding eyes, unpigmented eyeballs or lids and with prolonged exposure to sunlight.

Signs and symptoms

- Early lesions: plaque in the eyeball, wart-like growth protruding from the eyeball, horn-like projection from the eyelid, ulcer on the eyelid. Some may not progress to cancerous lesion
- Bleeding and weeping from the eye.
- May spread to the regional lymph node then to other body organs.

Diagnosis

- Clinical signs.

Treatment

- Veterinary care — surgical removal of the lesion and or affected eye. Get it done early before it invades surrounding tissues.

Prevention

- Management — select for pigmentation around the eye when breeding.
- Management — avoid breeding from cattle with eye lesions.



Eye cancer.



Eye cancer.

Foot abscess

Problem

Infection of the foot from injuries or by heavy rainfall can lead to the development of an abscess, that can sometimes extend up the lower leg or into the joint.

Signs and symptoms

- Lameness.
- Reluctant to move or stand.
- Localised swelling, redness, hot to touch, pus and or discolouration.

Diagnosis

- Clinical signs.
- Use of hoof testers and hoof knives for paring.

Treatment

- Veterinary care — therapeutic hoof trimming and paring; hoof block placement might be considered.
- Veterinary care — systemic antibiotics and non-steroidal anti-inflammatory drugs may be indicated in more severe cases.

Prevention

- Environment — avoid dirty, wet, and rough ground.
- Environment — keep concrete yards free of sharp gravels.
- Management — minimize stress when moving the herd.



Hoof abscess.



Hoof abscess in bull.

Grass tetany (hypomagnesaemia)

Problem

A fatal disease of low blood magnesium levels (hypomagnesaemia), caused by pastures with low magnesium (late autumn to early spring) or high potassium/nitrogen content (fertilisation application). Lactating cattle grazing on lush, fast-growing pasture or cows at early lactation with little to no feed are at higher risk.

Signs and symptoms

- Restlessness, frequent urination, drooling, stiff gait, and excitability early on.
- Muscle spasms, paddling convulsions, and sudden death

Diagnosis

- Blood or urine samples to measure magnesium and calcium levels.
- Pasture assessment.

Treatment

- Veterinary care — involving injectable magnesium sulphate solution under the skin or magnesium chloride, or Epsom salts diluted in water given as an enema.
- Diet — recovery should occur within a few hours, feed legume hay or add magnesium supplements to prevent recurrence.

Prevention

- Diet — adequate magnesium level provided in feed (treated with magnesium oxide) during high-risk periods.
- Diet — provide hay for source of calcium in herd's diet.
- Diet — provide limestone, salt, and magnesium oxide lick blocks.
- Diet — avoid pastures with high potassium or nitrogen.

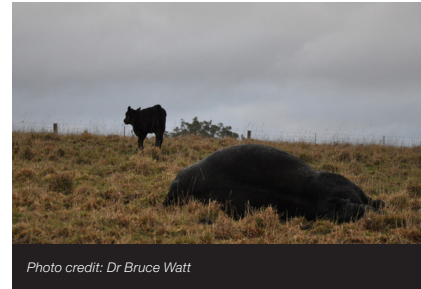


Photo credit: Dr Bruce Watt

Grass tetany related death.



Lick block supplement on a ryegrass pasture.

Hardware disease (traumatic reticuloperitonitis)

Problem

Ingestion of foreign material (wire, nails, or needles) that penetrate the reticulum, leaking gut content into the abdominal cavity, causing traumatic reticuloperitonitis (TRP). Penetration can also occur when the abdomen is compressed during pregnancy or when the animal is coughing or mounting. TRP can result in other complications or death.

Signs and symptoms

- Reduced appetite, fever, arched stance with abducted elbows.
- Ill-thrift.

Diagnosis

- Veterinary attention needed, involving manual pressure to localise pain and differentiation of abomasal ulceration, pleuropneumonia, and indigestion.

Treatment

- Veterinary care — includes oral administration of a magnet, systemic antibiotic, and non-steroidal anti-inflammatory drugs for pain relief.
- Veterinary care — surgery may be required to remove the object.

Prevention

- Management — ensure feedstuff is free of contaminants like nails, needles, or wire.
- Management — oral administration of magnet could prevent metal from penetrating the reticulum.



Photo credit: John House University of Sydney

The hole in the reticulum caused by a sharp object (hardware disease).

Heat stress

Problem

Heat stress is when cattle are unable to cope with excessive heat load, preventing thermoregulation. Heat stress and its severity can be influenced by the environment (high temperature, humidity), management (transport, stocking density) and individual animal factors (breed, coat type, physical activity, dehydration, concurrent diseases).

Signs and symptoms

- Sweating, drinking more, eating less, increase respiratory rate, seek shade, restless.
- Panting, drooling, foaming at the mouth, even open mouth or laboured breathing.
- Severe cases can lead to organ failure and death.

Diagnosis

- Use panting score to assess heat stress in cattle (0–4.5 with higher score relating to greater heat stress).

Treatment

- Treated as an emergency
- On land: ensure access to clean, cool water, minimise handling, reduce stock density, provide shade, reduce concentrated feed and consider ration with higher roughage proportion
- In transport: move cattle away from heat producing units, spread out animals, if possible, minimise disturbance to the cattle, increase access to water and add electrolytes, ensure maximum ventilation, provide fan-forced airflow, if possible, reduce concentrated feed.
- Severe condition: Spray wetting the cattle to improve evaporation of heat, use with caution with the absence of ventilation system, may risk increasing humidity.

Prevention

- Preparation based on environmental conditions as outlined in Treatment section to minimise the risk of heat stress occurring.



Cow panting in extreme heat.

Hypocalcaemia (milk fever)

Problem

Low blood calcium, which is essential for body function. This can be caused by depletion of calcium in bones (vitamin D deficiency), slow mobilisation of calcium (older, high conditioned cattle), reduction in absorption (fasting or feed deprivation) or by increased demand for pregnant and lactating cows.

Signs and symptoms

- Showing excitement or muscle tremors early on.
- Staggering gait, recumbency, then paralysis, coma, and death.

Diagnosis

- Clinical signs and history.
- Blood test for calcium levels.
- Consider pregnancy toxaemia (symptoms: gradual onset of a few days and minimal response to calcium) before calving.

Treatment

- Veterinary care — includes injectable calcium and magnesium solution under the skin. Response should be seen within few minutes (voluntary movements), full recovery should follow in an hour.

Prevention

- Diet — ensure food and water availability is not interrupted.
- Diet — feed roughage to increase dietary absorption of calcium in high-risk cattle.



Photo credit: Dr Bruce Watt

Down cow with hypocalcaemia.

Lead poisoning

Problem

Ingestion of lead (old batteries, lead paint or other forms of lead) by curious cattle causing poisoning.

Signs and symptoms

- Nervous signs — appear dull and unresponsive, muscle twitches, tongue paralysis, circling behaviour, blindness and running into things.
- Death.

Diagnosis

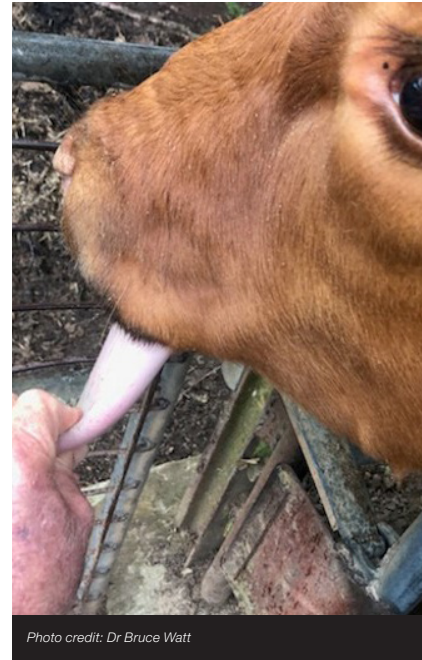
- History — access to lead.
- Clinical signs, blood samples
- Post-mortem — examination of reticulum for lead particles, high blood and liver lead levels

Treatment

- Veterinary care — early stages.
- Humane destruction — severely affected animals should be humanely euthanized ([see page 70](#)).

Prevention

- Environment — prevent access to lead-based objects, eg. old vehicle batteries.



Tongue paralysis associated with lead poisoning.

Leptospirosis

Problem

Infection caused by the bacterium *Leptospira*, mostly *L. hardjobovis* and *L. Pomona* that colonises the kidneys and reproductive tracts in females, causing production loss in mature cattle. Outbreaks are severe in calves and may cause death if not addressed. Passed on to animals and humans through damaged skin or membranes.

Signs and symptoms

- Abortion in >5 months pregnant cows.
- Drop in milk production for dairy herds.
- Change in milk indicative of mastitis, yet not presented with swelling or heat of the udder.
- High fever, jaundice, red-brown discoloured urine (red-water) in calves.

Diagnosis

- Blood test to detect leptospirosis infection.
- Red-water is distinctive in calves.
- Post-mortems (organs or from aborted calves)

Treatment

- Veterinary care — includes systemic antibiotics for individuals.

Prevention

- Vaccination — vaccines are commercially available.

Lice

Problem

External parasite found in the environment, causing skin irritation, further exacerbated by scratching, and rubbing. Spread through cattle rubbing against each other. Tend to be more common in winter months.

Signs and symptoms

- Can be seen under conditions of good lighting around irritated areas.
- Signs of itchiness, rubbing on fences, other animals.

Diagnosis

- Presence of lice when examining the affected individuals.

Treatment

- Commercially available pour-on treatment for lice control.

Prevention

- Prevent entry of infested cattle, isolate other cases.



Photo credit: John House University of Sydney

Lice.

Malignant catarrhal fever (MCF)

Problem

Malignant catarrhal fever is a systemic disease caused by two herpes viruses, one transmitted by sheep (ovine herpesvirus-2) that is present in Australia and the other from wildebeest (alcelaphine herpesvirus-1) which is not found in Australia making it a notifiable disease. MCF is only transmitted from carriers (sheep) to susceptible cattle and occurs sporadically involving single animals.

Signs and symptoms

- High fever, cloudy eyes, catarrhal discharges from the eyes and nose, erosion of the muzzle and oral surface.
- Death.

Diagnosis

- Blood test for MCF antibodies.
- Tissue samples for confirmation at a veterinary laboratory.

Treatment

- Veterinary care — no specific treatment only supportive care for infected cattle.

Prevention

- Management — separation of cattle from reservoir hosts (sheep, in particular lambs).



Cloudy eye associated with MCF.



Nose discharge associated with MCF.



Erosion of oral surface associated with MCF.

Nitrate - nitrite poisoning

Problem

Increased consumption of nitrate which is converted into nitrite and then into ammonia by rumen microbes. Nitrite reduces the oxygen carrying capacity of blood, causing hypoxia and death. This can be a result of increased nitrate in soil (drought broken by high rainfall), found in contaminated water sources, and consumption of hay that has been heavily fertilised with nitrogen.

Signs and symptoms

- **Nitrate poisoning** — diarrhoea, vomiting, salivation and abdominal pain.
- **Nitrite poisoning** — weakness, ataxia, respiratory distress, brown mucous membranes after 6–24 hours of ingestion.
- Abortion can occur after 10–14 days of ingestion.
- Collapse and death from asphyxia convulsions.

Diagnosis

- Clinical signs and herd history.
- Serum samples for nitrite levels.
- Plant samples.

Treatment

- Management and diet — remove animals from potential source of poisoning (pasture, hay) and offer alternative feed (free from nitrate/nitrite).
- Veterinary care — seek veterinarian advice.

Prevention

- Diet — avoid feeds with high nitrate (analyse samples).
- Diet — supplementary feed herd with dry hay or mature grass before accessing high risk pastures/crops.



Photo credit: Dr Bruce Watt

Nitrate poisoning death.

Papillomatosis (warts)

Problem

Papilloma virus enters skin through direct contact with infected cattle and objects (e.g. feed troughs, ear tagging pliers etc.) creating hairless skin growth (warts) appearing anywhere on the body, mostly on surfaces prone to abrasion (e.g. head, neck, shoulders). Reducing hide value.

Signs and symptoms

- Sudden appearance of warts that proliferate rapidly.
- Shape and sizes of lesions vary — hard surface, smooth and rounded, finger-like projection, dry and crusty surface.
- Could affect reproduction if occur on penis and prepuce of bulls, or udders and vulvas of cows.

Diagnosis

- Clinical signs.
- Biopsy for confirmation.

Treatment

- Treatment is rarely necessary as self-cure is common.
- Veterinary care — surgical removal is sometimes warranted in specific cases (e.g. penile warts in breeding bulls).

Prevention

- Vaccination — vaccines are commercially available for problem herds.



Warts on the neck.

Perennial & annual ryegrass toxicity

Problem

Perennial ryegrass toxicity: overconsumption of ryegrass infected by the fungus *Neotyphodium lolii* resulting in toxicity. This is more common when grazing in summer and autumn months with increased pasture growth.

Annual ryegrass toxicity: overconsumption of ryegrass infected by the bacterium *Rathayibacter toxicus* by a parasitic nematode, resulting in toxicity. This is more common when grazing in spring.

Signs and symptoms

- **Perennial ryegrass toxicity:** Loss of coordination, falling over, convulsions, and or death relating to lack of coordination.
- **Annual ryegrass toxicity:** staggering, collapse, trembling, convulsions and death.

Diagnosis

- Clinical signs.
- Ryegrass testing.
- Rumen sample & blood test for confirmation at a veterinary laboratory.

Treatment

- No specific treatment.
- Move the mob to a 'safe' paddock with feed, water, and shade.
- Humane destruction – animals severely affected (unable to rise within 12 hours) need to be humanely euthanised ([see page 70](#)).

Prevention

- Management — daily inspection of livestock, ryegrass testing, prevent introduction of the causative organism through good biosecurity, and paddock management.
- Management — sowing pastures with legumes or other grass species to dilute toxins.



Photo credit: NSW DPI

Perennial ryegrass.

Phalaris toxicity

Problem

Sudden death and stagger syndrome from ingestion of *Phalaris aquatica* containing toxic alkaloids, which can lead to death in severely affected animals. Generally, occurs a minimum 10 days after grazing, whereas nervous symptoms can be delayed for 2-5 months.

Signs and symptoms

- Head nodding, a wide based gait, walking on their knees, or knuckle at the fetlocks.
- Abnormal eating behaviour.
- Heart attack progress from stagger, sudden death.

Diagnosis

- Post-mortem — examining the brain.

Treatment

- No effective treatment.

Prevention

- Management — provide cobalt supplementation in lick blocks or drenches. Cobalt stimulates the proliferation of microbes in the rumen capable of destroying the toxic alkaloid causing staggers syndrome.



Phalaris.

Photosensitisation

Problem

Inflammation of the skin through consumption of photosensitising substances (e.g. St John's wort, buckwheat, parsley, or from liver damage (caused by plants such as caltrop, *Brachiaria spp.*, *Panicum spp.*, Paterson's curse, lupins (lupinosis), etc). Sunlight activates these substances resulting in local damage. Does not require prolonged exposure to sunlight.

Signs and symptoms

- Affected area, likely non-pigmented skin become itchy, swelling, forming blisters and scabs.
- Irritation and restlessness.
- Seeking shade.

Diagnosis

- Clinical signs — need to differentiate between sunburn.

Treatment

- Environment — provide shade.
- Management — avoid access to green feed/weeds.
- Veterinary care — treat and prevent secondary skin infections and flystrike.

Prevention

- Environment and diet — avoid grazing cattle on hepatotoxic and phototoxic plants.
- Management — screen out animals with skin lesions.



Photo credit: John House University of Sydney

Photosensitisation.

Pink eye

Problem

Rapidly spreading bacterial infection (likely *Moraxella bovis* in cattle) in the eye combined with irritation or trauma to the corneal surface. Risk factors include dust, dryness, ultraviolet light (UV light), flies, grass seed etc.

Signs and symptoms

- Bloodshot eyes, eye discharge staining the face, closed eyelid.
- Cornea goes through stages of red, sometimes becoming an abscess, then blue, grey, and finally white from scarring.

Diagnosis

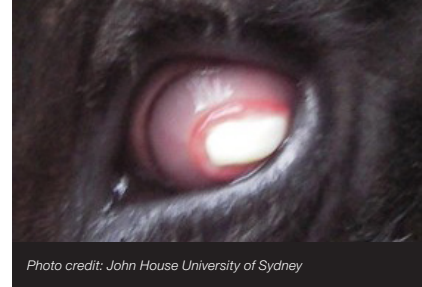
- Clinical signs.
- Affected cattle should be checked for grass seeds or other foreign material in the eye, clinical presentation could be similar to pink eye.

Treatment

- Pink eye will normally heal without treatment.
- Veterinary care — antibacterial treatment (systemic and topical) could likely shorten the duration of disease and prevent complications like blindness and corneal scarring.
- Simple surgery can save early cases.
- Application of a simple eye patch is often very effective.

Prevention

- Veterinary care — commercial and prescription vaccines for pink eye.
- Environment — reduce exposure to grass seeds and airborne feed particles and fly control.
- Management — minimise stressors such as excessive handling, crowding, and undernutrition.
- Control flies as much as possible.



Pink eye.



Pink eye.

Polioencephomalacia (PEM)

Problem

Degeneration of the brain associated with thiamine (Vitamin B1) deficiency from proliferation of bacteria in the rumen that produces thiaminases. Ruminant acidosis and high sulphur intake through high protein pastures that are rich in sulphur put cattle at high risk.

Signs and symptoms

- Ear twitching, incoordination, hypersensitivity to stimulus.
- Dull, blindness, head pressing, stargazing head position.
- Convulsing, comatose, or death.

Diagnosis

- Clinical signs.
- Post-mortem — examination of the brain tissue.

Treatment

- Veterinary care — injection of thiamine and dexamethasone depending on the presentation.
- Diet — sulphur induced PEM have poorer response to treatment. Removal or replacement of feed and water containing sulphur. Give more roughage.
- Humane destruction — for severely affected cows humane euthanasia is recommended ([see page 70](#)).

Prevention

- Diet — provide adequate dietary fibre and gradually change diet.
- Diet — prevent acidosis or indigestion.
- Diet — avoid rations and water high in sulphur.



Photo credit: Dr David Champness

PEM affected dairy heifer.



Photo credit: Dr David Champness

PEM affected brain.

Pregnancy toxaemia (fatty liver syndrome)

Problem

Breakdown of fat in the liver, producing ketones, which accumulates in the brain and becomes toxic (same pathway as acetoaemia).

This can be caused by an increase demand for glucose in pregnant cows, from feed deprivation, inadequate energy in feed impeding utilisation of fat in the liver, causing fat build-up. Fat cattle (BCS >4) in the last two months of pregnancy are at a higher risk.

Signs and symptoms

- Depression and lethargy; reduced appetite, may appear stubborn or confused.
- Rapid respiratory rate, with sweet acetone-like odour in their breath.
- May become recumbent before calving (calves may be aborted or premature) and eventually die within 2 weeks.

Diagnosis

- History and clinical signs.
- Blood and urine test for ketones.

Treatment

- Veterinary care — includes fluid therapy, caesarean, or induction of calving.
- Veterinary care — intravenous injection glucose, calcium borogluconate and magnesium salt is more effective than given under the skin.
- Veterinary care — mild case can be treated with propylene glycol and electrolytes.
- Diet — encourage affected cattle to start eating green feed.

Prevention

- Management — ensure good body condition at calving (BCS 3)
- Diet — ensure proper nutritional management, adequate energy, and feed during lactation.
- Diet — minimise period of feed deprivation, rapid diet changes, and avoid unpalatable or low energy feeds.

Pyrrolizidine alkaloids toxicity

Problem

Cattle grazing on plants (e.g. Paterson's curse, rattle weed, tansy ragwort) containing pyrrolizidine alkaloid toxins that are metabolized in and damages the liver. More commonly occurring during drought conditions.

Signs and symptoms

- Loss of condition, anorexia, dullness, constipation, or diarrhoea. Straining and passing bloodstained faeces.
- Head-pressing, yawning, aimless wandering with progressive hepatic injury.
- Photosensitisation.
- Acute exposure causing death is rare.

Diagnosis

- History and clinical signs.
- Blood test for toxic metabolites.

Treatment

- Management — avoid further ingestion of toxic plants.
- Diet — rations high in carbohydrates is recommended.
- Veterinary care — supportive care (e.g. fluids).

Prevention

- Management and environment — reduce exposure to toxic plants, consider annual herbicide application.



Paterson's curse.

Retained foetal membranes

Problem

Foetal membranes not expelled within 24 hours of giving birth (should normally be expelled within 3–8 hours). May lead to life-threatening complications like metritis and toxæmia. More commonly associated with early or abnormal parturition or abortion.

Signs and symptoms

- Visible membranes at the vulva.
- Some without any external signs, smelly discharge

Diagnosis

- Clinical signs — obvious presentation of membrane at the vulva.
- Veterinarian — physical, vaginal, and rectal examination.

Treatment

- Treatment not required if the cow is eating and productive.
- Veterinary treatment — involving treating sick cow with systemic antibiotics (procaine penicillin, oxytetracycline or trimethoprim sulpham).
- Tying a stick or stone to it to provide gentle traction often helps.

Prevention

- Diet — adequate nutritional management leading up to calving, avoid hypocalcaemia and negative energy balance.



Photo credit: Associate Professor David Beggs

Retained foetal membrane in a dairy cow.

Ringworm

Problem

Circular, hairless skin lesion caused by a fungal infection *Trichophyton verrucosum*. Infection is caused by cattle coming into contact with infective fungal spores in the environment or from other infective animals. Ringworm can be passed onto humans.

Signs and symptoms

- Circular and coalesced lesions occurring on the body, mostly on the head and neck (3 cm in diameter).
- Moist and reddened skin initially, then dry, scaly, and grey.

Diagnosis

- Visual appearance.
- Deep skin scrapings or biopsy sent to a veterinary laboratory for confirmation.

Treatment

- Treatment is not necessary; it commonly heals in about 8 weeks.
- Imidazole spray may stop progression of lesions and slow the spread to other cattle.

Prevention

- Management — prevent mixing cattle with active ringworm infection and isolate any cases.
- Management — process affected animals last in handling facilities and treat with imidazole spray at each yarding.



Ringworm.

Selenium deficiency

Problem

Harmful free radicals are generated from selenium deficiency, which damage muscle tissues of the heart and limbs, also referred to as nutritional muscular dystrophy or white muscle disease. Cattle grazing on selenium-deficient pasture such as lush, rapidly growing pasture, legume-dominant pasture, pasture grown on selenium-deficient soils or paddocks that received heavy sulphur-containing fertiliser application are at risk.

Signs and symptoms

- Drop in production for mature cattle.
- **Young cattle:** Ill-thrift, poor growth, chronic diarrhoea, and retention of winter coats.
- **Subacute:** Stiff-legged gait, weakness and unable to stand or walk.
- **Acute:** Collapse or death.

Diagnosis

- Blood test for selenium levels.
- Liver biopsy from affected cattle for confirmation at a veterinary laboratory.
- Soil and pasture or feed samples.

Treatment

- Management — drenching, injection, pour-on methods, lick blocks of selenium supplementation.

Prevention

- Management — addition of selenium in pasture through application of fertiliser.
- Diet — provide supplementation of selenium in diet for high risk cattle.



Photo credit: Dr. Bruce Watt

Selenium deficiency death.



Photo credit: Dr. Bruce Watt

Post-mortem of swollen liver.

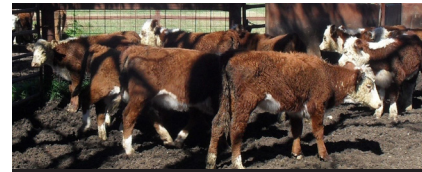


Photo credit: Dr. Bruce Watt

Ill thrift related to selenium deficiency.

Theileriosis

Problem

Caused by blood-borne protozoan parasite, *Theileria*, which is transmitted via cattle ticks. Causes anaemia with secondary reduced oxygen supply and weakness that can be fatal.

Signs and symptoms

- Anaemia causing lethargy, weakness, pale or yellow colour of the vulva or third eyelid, may have a high fever.
- Pregnant cows may abort and still births are common.
- Drop in milk production in dairy cows.

Diagnosis

- Blood test for *Theileria*.

Treatment

- Veterinary care — systemic antibiotic treatment, however there is poor response for severely affected cattle.

Prevention

- Management — avoid introducing and mixing cattle from different *Theileria* exposure areas.
- Management — reduce susceptibility through good husbandry and appropriate nutrition.

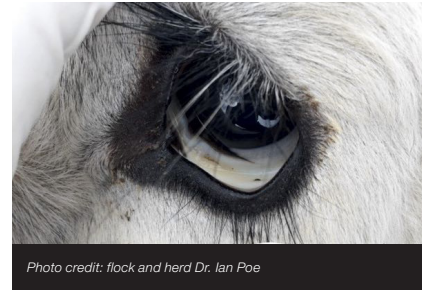


Photo credit: flock and herd Dr. Ian Poe

Conjunctiva anaemia caused by *Theileria*.



Photo credit: flock and herd Dr. Ian Poe

Vulva anaemia caused by *Theileria*.

Travel tetany

Problem

Associated with transport stress, causing electrolyte imbalance (hypocalcaemia and sometimes hypomagnesaemia) rather than a disease. Caused by periods of food and water deprivation while being transported, grazing lush pasture, heavy feeding with grain prior to transport, and forced exercise after transport increases risk. Older, fatter, pregnant, or lactating animals are at a higher risk.

Signs and symptoms

- Restlessness, incoordination, sometimes aggression.
- Knuckling, staggering, laying on their side, frothing at the mouth, and grinding teeth.

Diagnosis

- History and clinical signs.
- Blood serum sample to test for electrolyte imbalance to confirm.

Treatment

- Veterinary care — injection of commercially available calcium borogluconate and magnesium sulphate solution.
- Veterinary care — sit the animal upright if laying on their side to avoid aspirating regurgitated rumen contents.

Prevention

- Management — adequate roughage and avoid prolonged feed deprivation before transportation.
- Management — avoid working cattle immediately after long periods of transport, especially those of higher risk.

Vibriosis (Campylobacteriosis)

Problem

Infectious venereal disease by *Campylobacter fetus* causing major reproductive loss through infertility and abortion. The bacteria are spread by infected bulls to susceptible cows and heifers through mating.

Signs and symptoms

- No clinical signs
- Should be suspected with high percentage of early embryonic loss, poor conception rate, or poor calving rate.
- Occasional abortions, usually around 6 months of pregnancy.

Diagnosis

- Vaginal mucous sample from infected cows and heifers sent to a veterinary laboratory for confirmation.
- Testing bulls is not reliable.

Treatment

- Usually self-limiting with development of immunity in cows, heifers, and bulls.

Prevention

- Vaccination — vaccines commercially available, mostly treating infected bulls.

Management guides



Good biosecurity

On-farm biosecurity involves proactively managing and preventing risks caused by weeds, pests and diseases entering, emerging, establishing or spreading.

Good biosecurity principles

- **Principle 1:** Record all livestock movements, purchases, sales and treatments.
- **Principle 2:** Always buy livestock from reputable sources.
- **Principle 3:** Make sure all purchased livestock have an animal health declaration from the vendor.
- **Principle 4:** Develop a treatment program for new livestock (e.g. drenching, lice treatment, vaccination).

Farm visitors

Visitors to your farm pose a potential risk of introducing diseases and pests.

It is important to do a risk assessment of visitors, including whether they have recently been overseas.

- **Principle 1:** Keep visitors (friends, agents, etc) out of livestock production areas.
- **Principle 2:** If people need to access production areas, clean all tools, equipment, and footwear.
- **Principle 3:** Visitors returning from overseas travel should avoid contact with livestock and farms for 7 days.

Boot wash procedure



Remove excess foreign material from the sole of your boots away from the production zone and washing area - you may do this by banging boots together or using a tool to scrape out the boot tread.



Wash boots/footwear in a bucket filled with water and use a scrubbing brush if required to remove all excess foreign material. Clean any tools or equipment in the same bucket of water.



Finally, rinse clean boots/footwear and tools in a separate bucket of disinfectant or use a spray bottle containing disinfectant.



Carefully and mindfully dispose of dirty water and waste disinfectant.

One Biosecurity

What is One Biosecurity?

The One Biosecurity program is free for South Australian livestock producers and has been designed to help producers register, manage, and promote on-farm biosecurity. The platform can also be used as a resource for guidelines and advice on livestock diseases.

Developed in collaboration with key industry groups, One Biosecurity recognises the important role producers have in protecting and growing our state's livestock industry.

Once registered, you will be self-guided through two core online components:

- Biosecurity Practices Questionnaire (score 1-5 stars)
- Endemic Disease Risk Rating modules (Risk Rating for a series of diseases including Johne's disease, footrot, lice, pestivirus and ovine brucellosis).



Why register?

All producers in Australia must have a farm biosecurity plan (Livestock Production Assurance requirement). One Biosecurity will generate an approved biosecurity plan in a simple, free, online process.

Other benefits include:

- generating an Animal Health Declaration
- assisting with purchasing decisions
- providing credible assurance to existing domestic and international markets
- improving government and industry disease surveillance and early detection of animal health emergencies.

Contact

For help registering your property and completing your risk assessment contact 1BSupport@sa.gov.au or call 08 8429 3300.



Scan QR code to learn more about One Biosecurity or visit www.onebiosecurity.pir.sa.gov.au

Vaccination

Vaccination is the key to preventing some cattle diseases.

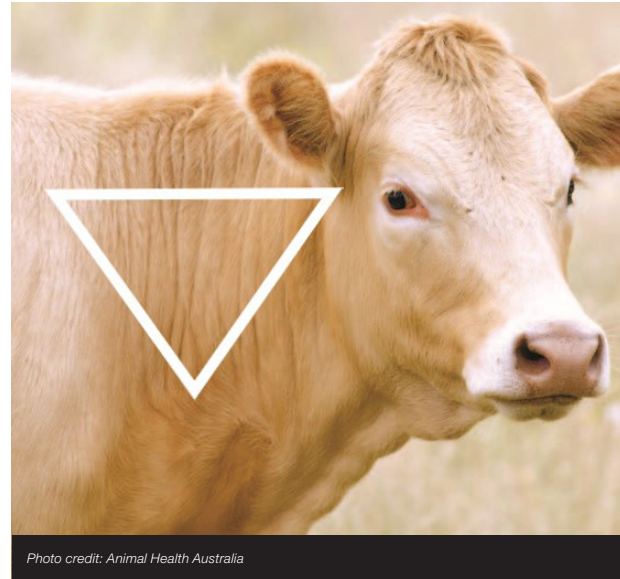
Why vaccinate?

Cattle are vaccinated to protect against some of the common serious infectious diseases. Vaccination stimulates the body's defence system to build immunity to a particular disease or combination of diseases and when given to cows prior to calving can provide helpful antibodies in colostrum for healthier calves. Vaccinations should be administered to livestock as part of an annual management plan.

Which vaccine is best?

Cattle vaccines are available from many different suppliers to provide protection against clostridial diseases, pestivirus, Johne's disease, leptospirosis, salmonella, bovine respiratory disease and many others.

There is no 'one size fits all' approach to vaccination and many things to consider including, timing, cost, additional supplements and stock type. Producers should consult their local veterinarian or PIRSA Animal Health officer for professional advice to best suit their situation.



Location of vaccinations.

Parasite prevention

Cattle worms

There are 6 main types of worms responsible for the worm problems occurring in Australian cattle herds:

1. Brown stomach worms (*Ostertagia ostertagi*)
2. Black scour worm (*Trichostrongylus* spp.)
3. Thin-necked intestinal worm (*Nematodirus* spp.)
4. Stomach hair worm (*Cooperia oncophora*)
5. Large bowel worm (*Oesophagostomum Radiatum*)
6. Barbers pole worm (*Haemonchus placei*)

Assessing worm burden

Scouring and ill-thrift are generally associated with worm infestations, however this is not always the case and can be a poor indicator of the worm burden in cattle.

There are two reliable ways of assessing worm burdens in cattle - faecal egg counts and total worm counts.

Faecal egg count

- Faecal egg counts are the best method for monitoring worm burdens in a herd of cattle.
- The number of worm eggs in a cow's faeces is used to estimate the number of worms the animal is carrying.
- Generally, 2 pools of 5 samples. 5 grams of faeces per animal is needed for up to 5 animals. Do this twice for 2 pools of 5 samples.
- The advantages are:
 - » Relatively simple and inexpensive.
 - » If sampled correctly it gives a good assessment of worm burden.
 - » Gives rate of pasture contamination by worm eggs.
 - » It is not necessary to sacrifice any sheep.

Total worm count

- The total number of worms in cattle can be counted and identified at post mortem.
- It provides an accurate count of the number of worms in an animal, but it does involve sacrificing that animal.

Cattle worms

Worm control programs

When to drench - a faecal egg count is the best practical guide currently available to decide on the need for treatment.

Choosing a drench - when choosing a drench, you need to know the specific properties and potential uses of all of the different drench groups and the current drench resistance status of your property. Get good professional advice on this from your veterinarian

Paddock management – where possible, put newly drenched cattle into a clean paddock that has not been recently grazed, as it will greatly assist in breaking the life cycle of the worms.

Drench resistance

Drench resistance occurs once a population of a species of worm can survive a dose of a drench that would have previously killed it. Worms killed by a drench are said to be susceptible to the treatment.

The rate of development of drench resistance can be influenced by many factors such as:

- The chemical group and persistence of the product involved.
- The frequency of treatments.
- The worm species involved.
- Environmental factors such as climate.

See “Wormboss” website for further information on worm control.



Scan QR code for the
'Wormboss' online
resource or visit
www.wormboss.com.au

NLIS obligations

The National Livestock Identification System (NLIS) is Australia's system for identifying and tracing cattle, sheep and goats. The database records the lifetime location data and movement of all livestock in Australia using individual identification (cattle) and flock identification (sheep and goats). All physical locations are identified by a Property Identification Code (PIC).

When livestock are moved to another PIC, being sold, adjusted or relocated to another property, this movement must be recorded on the NLIS database.

Who is responsible?

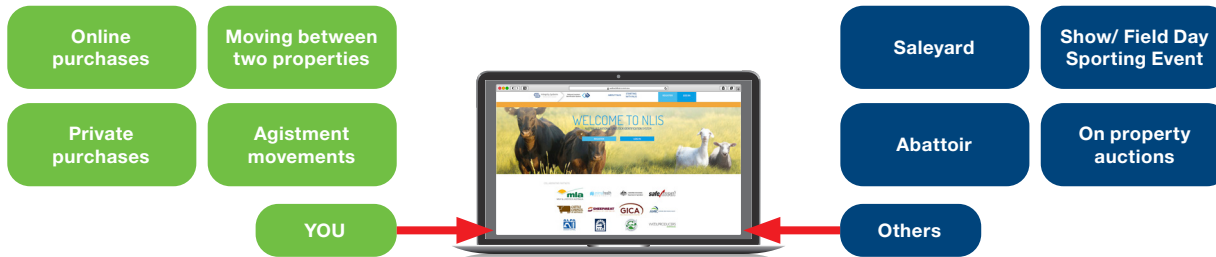
Depending on the livestock movement that is occurring, different parties are responsible for recording livestock movements on the NLIS database, as either mob-based movements with visual NLIS tags or individual animal movement with electronic RFID NLIS tags.

How do you do this?

- All livestock movements to a different PIC must have a national vendor declaration (NVD), even if the owner of the livestock does not change. It is also advisable to use a National Cattle Health Declaration.
- The NLIS database must be notified when one or more sheep are moved to a different PIC.
- The NVD details are included on the livestock transfer on the NLIS database.
- Access the NLIS database at www.nlis.com.au

Support

Call Integrity Systems Company (ISC) Support on 1800 683 111 for database issues, LPA, eNVDs or PIRSA NLIS Help Desk on 1800 654 688.



Fit to load

It is an offence to load or transport an animal in a way that causes it unnecessary harm. The person in charge of the animal is responsible — if in doubt, leave it out.

An animal is not fit to load if it:

- is not strong enough to undertake the journey
- cannot walk normally, bearing weight on all legs (e.g. old or new fractures, injury, deformity, foot abscess, joint infection)
- is severely emaciated or visibly dehydrated
- is suffering from severe visible distress or injury (e.g. swollen pizzle, exhaustion, panting, flystrike)
- has a condition that could cause it increased pain or distress during transport (e.g. ingrown horn, cancer (vulva, udder, ear), swollen testicles, advanced mastitis)
- is blind in both eyes
- Is within two weeks of calving and the estimated journey time or time off water is likely to exceed four hours.



Scan QR code to learn more or visit www.mla.com.au/isitfittoload



Scan QR code for 'Australian Animal Welfare Standards and Guidelines for Cattle' or visit www.animalwelfarestandards.net.au/cattle

Maximum time off water

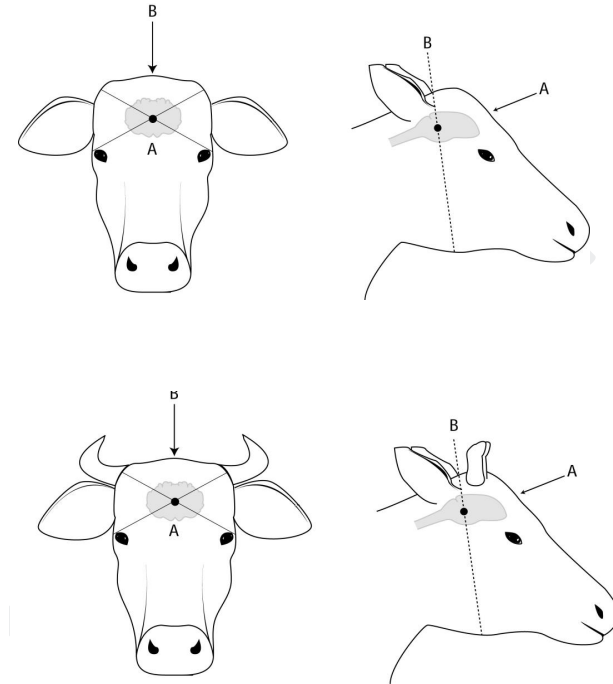
Class of animal	Maximum time off water	Minimum spelling period
Cattle over 6 months old	48 hours	36 hours
Calves 30 days to 6 months old	24 hours	12 hours
Cows known to be more than 6 months pregnant, excluding the last 4 weeks	24 hours	12 hours
Calves 5 to 30 days old travelling without mothers (12 hours maximum journey)	18 hours	

Humane destruction

(A) Indicates the frontal method,

(B) indicates the poll method. For blunt trauma in calves less than 24 hours old, use position A.

Confirming death after any method of destruction is essential - check for loss of consciousness and deliberate movement, dilated pupils, absence of the 'blink' reflex when the eyeball is touched and absence of breathing, jaw tone and tongue tone.



Sourced from: Australian Animal Welfare Standards and Guidelines for Cattle

Acknowledgments & further reading

Acknowledgments & further reading

The information for this publication has been collected from:

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Useful contacts and online resources

Emergency Animal Disease Hotline	1800 675 888
PIC Registration Office (SA)	1800 654 688
	08 8207 7919
LPA NVD Helpline	1800 683 111
NLIS Database Helpdesk (National)	1800 654 743
NLIS Hotline (SA)	1800 654 688
RSPCA SA (Welfare)	1300 477 722
Livestock SA	08 8297 2299

Local PIRSA Animal Health Offices (bolded offices have PIRSA veterinarians)	Glenside	08 8207 7900
	Clare	08 8842 6222
	Mt Gambier	08 8735 1300
	Kingscote	08 8553 4949
	Pt Augusta	08 8648 5160
	Murray Bridge	08 8539 2110
	Nuriootpa	08 8568 6400
	Pt Lincoln	08 8688 3400
Struan	08 8762 9100	

One Biosecurity

www.onebiosecurity.pir.sa.gov.au

Biosecurity SA

www.pir.sa.gov.au/biosecurity/animal_health

Farm Biosecurity

www.farmbiosecurity.com.au

ParaBoss (WormBoss, LiceBoss, FlyBoss, TickBoss)

www.paraboss.com.au

'Is the animal fit to load?' Guide

www.mla.com.au/isitfittoload

Livestock SA

www.livestocksa.org.au

Local Veterinary Clinic	Name/clinic:
	Contact number:



Government of South Australia

Department of Primary Industries and Regions