

## Setting directions

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### Key actions

- Know the common cattle diseases in your locality and whether they are likely to affect production.
- Implement a disease management plan using veterinary advice.
- Vaccinate against specific diseases that can infect cattle and people.
- Seek veterinary advice for any unexplained health problem.
- Develop a biosecurity plan to prevent the introduction of infectious diseases.
- Review all factors affecting the welfare of your cattle herd.

### Why is the health and welfare of your herd important?

A well planned approach to managing cattle health and welfare controls the risk of disease in a cost-effective way and maximises the production potential and profit of your herd.

In the arid zone, animal husbandry practices are carried out depending on seasonal conditions and usually each mob may only be handled in a yard once or twice a year. This means that the cattle health program generally revolves around ensuring animals have adequate feed and water, with less emphasis on specific disease management as in more intensively managed herds.

While the direct cost of managing diseases in beef herds appears relatively small, individual diseases and disorders can have a major financial impact on profitability.

This module outlines the key procedures required to manage a healthy beef cattle herd.

#### **Manage cattle health and welfare to maximise herd profit.**

#### **Use a combination of disease prevention and treatment**

A sound animal health management plan uses preventative approaches to avoid disease from striking, and early treatment in the event that it does.

If treatment is necessary, it should involve the use of as few chemicals as possible. Access to both domestic and export markets are dependent on beef being free from chemical and pesticide residues.

A small but increasing number of arid zone producers have gained organic accreditation for their beef enterprises, which places very strict limitations on the use of most chemicals. Also, the overuse of some chemicals to treat disease has led to them becoming ineffective (such as antibiotics) and there are few new options available to producers.

### How does this module assist you?

This module describes how to prevent health problems in preference to reacting after disease has already affected the herd. It is based on:

- knowing the conditions that can influence cattle health
- applying the right management strategy or treatment when your cattle are at risk
- preventing the introduction of infectious diseases onto the property.

### Linkages to other modules

This module outlines the procedures required to manage a healthy cattle herd. Without implementing these procedures, producers cannot achieve the productivity gains possible when excess feed is available (see **Module 2: Managing your feedbase**), procedures to better utilise feed and optimising weaner throughput (see **Module 5: Maximising weaner throughput**).

Following the five procedures in this module will also help producers to meet market specifications (see **Module 7: Meeting market specifications**).

### Principles and procedures of herd health and welfare

- Know the most important cattle diseases and disorders in your region.
- Disease prevention is more effective and less costly than treatment.
  - Procedure 2 - Determine the risk and vaccinate for specific diseases
  - Procedure 3 - Watch for sporadic diseases and disorders
  - Procedure 5 - Manage the welfare of your cattle herd

### Procedures for managing the health and welfare of your herd

- Procedure 1 - Choose the appropriate disease and disorder prevention, management practice, corrective treatment, or a combination
- Procedure 4 - Adopt biosecurity strategies to prevent the introduction of infectious diseases

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### Guidelines for choosing the appropriate disease management practice

All the procedures in this module rely on knowing the health problems that are potential risks to your beef enterprise.

#### Know the common cattle diseases in your locality.

Consider whether any of the more common diseases or nutritional disorders are likely to occur in your beef enterprise by assessing:

- grazing and husbandry practices
- age groups and classes of cattle
- disease status of introduced cattle
- the locality of your enterprise.

**Tool 6.01** provides a list of common production and reproductive diseases and conditions for their likely occurrence. These diseases of cattle can lead to significant economic loss when left untreated or treatment is delayed.

Diseases that affect cattle may be caused by:

- infections from bacteria, viruses or fungi
- plant poisonings
- nutritional deficiencies, excesses or imbalances
- metabolic disorders.

Pathogenic or viral infections include:

- calf scours (neonatal calf diarrhoea)
- pinkeye
- botulism

Plant poisonings/allergies

- *Pimelea* poisoning (Marree or St. George disease or rice flower poisoning)
- Other plant poisonings that can occur when conditions suit the growth of the particular toxic plant or when livestock are hungry (such as cattle entering a weedy yard that has not been used for a while).

Nutritional diseases discussed in this procedure include:

- bloat
- phosphorus deficiency
- ketosis (pregnancy toxaemia)
- hypocalcaemia (milk fever).

Important reproductive diseases include:

- vibriosis
- leptospirosis
- mucosal disease - bovine pestivirus; bovine viral diarrhoea virus (BVDV).

Consult with neighbours, producers with similar production systems, local veterinary practitioners, state departments of primary industries and agriculture to assist with a thorough assessment of the disease status of your herd.

#### Use local and veterinary advice to develop a disease management plan.

Check that your herd is free of diseases by using **Tool 6.02**, an aid to diagnosing a number of common cattle diseases. Misdiagnosing a disease may result in substantial losses so consult with a veterinarian to confirm a diagnosis.

Disease prevention is more effective and less costly than treatment. Vaccinate against specific diseases if it is cost-effective or there is a human health risk

Once the risk from any particular animal health issue has been identified, decide whether to:

- take immediate action and develop a preventive management program, or
- monitor the herd when disease symptoms are likely to occur in the production cycle, and act only when diseases appear.

## What to measure and when

Individual diseases have different requirements for what to measure and when. Refer to the Toolkit at the end of this module for more information on the following measurement aids:

- indicators of the conditions likely to lead to the development of common diseases of cattle (Tool 6.01)
- diagnostic tools to detect the presence of common diseases (Tool 6.02)
- an understanding of the likely impact of a disease and how severe it needs to become to affect production
- market information on commodity prices to calculate cost–benefit budgets.

## Further information

- Information on common diseases and disorders may be available on state department of primary industries and agriculture websites (see Tool 6.13).

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### Guidelines for implementing a vaccination program

Vaccination is effective in preventing some common cattle diseases. Base the decision to vaccinate on whether the potential loss is more than the cost of a vaccination program, or if the disease poses a human health risk.

Identify the diseases that can infect cattle, and people, and can be vaccinated against in your beef enterprise. These include:

- clostridial diseases
- vibriosis
- leptospirosis
- mucosal disease (pestivirus)
- pinkeye

Seek local advice from your veterinarian or state department of agriculture. A table to help determine the presence of these diseases treatable by vaccination is presented in **Tool 6.05**.

Vaccinate against specific diseases if it is cost-effective or a human health risk. If you do have to vaccinate, the timing of the treatment is important.

Zoonotic diseases (those that affect both cattle and humans) are listed in **Tool 6.06** and include:

- leptospirosis
- Q-fever
- campylobacteriosis
- milkers nodule
- brucellosis
- tuberculosis
- cryptosporidiosis
- yersiniosis
- salmonella
- listeriosis
- ringworm
- anthrax

Assess the risk of cattle diseases infecting people.

It is critical that a thorough risk assessment is conducted on the likelihood of you, or anyone that may come into contact with your animals, contracting one of these zoonotic diseases. If there is any risk at all, a vaccination program should be implemented or a management system put in place that is guaranteed to prevent transmission of the disease.

### What to measure and when

If you have not already done so, assess your beef enterprise's current disease risk status then reassess whenever conditions that affect the disease occur, or the enterprise changes to include new or different classes of stock.

The following should be monitored regularly:

- the conditions likely to lead to the development of common cattle diseases (see **Tool 6.01**)
- the presence of signs of disease that can be prevented by vaccination (see **Tool 6.04**).

Regularly assess the disease status of your herd.

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### Guidelines for managing sporadic diseases

Develop a routine to record details of diseased cattle or deaths whenever they occur.

Record keeping is particularly important for large-herd operations where more than one stock person looks after the cattle. Records need to include information such as the mob or herd the animal belonged to, their immediate grazing history and all previous animal health treatments.

Animal identification tags and computer software programs for record-keeping are commercially available.

### National Livestock Identification System

The National Livestock Identification System (NLIS) is Australia's system for identification and traceability of livestock. It was introduced in 1999 to meet European Union requirements for cattle exports. Since then it has expanded to enable cattle to be traced from property of birth to slaughter for:

- biosecurity
- meat safety
- product integrity
- market access

NLIS is endorsed by major producer, feedlot, agent, saleyard and processor bodies. In addition to this it is underpinned by State and Territory legislation, which forms the regulatory framework for the system.

All cattle are required to be tagged with an NLIS-approved device (either an ear tag or rumen bolus/ear tag combination) and all movements or transactions must be recorded on the NLIS database.

Further information on NLIS is available from your local NLIS authority (see Tool 6.15).

Electronic tags make animals traceable when they leave the property. In addition they enable the efficient use of automated record-keeping systems to store information electronically. This includes animal health records and production records such as live weights, calves weaned and other parameters of animal productivity.

### Good records are the basis of quality assurance

You can implement any recognised quality assurance program based on keeping good records and established veterinary codes of practice for cattle health and welfare. This may also provide access to new markets and/or better prices.

### Livestock Production Assurance

Livestock Production Assurance (LPA) is a program that underpins the National Vendor Declaration and Waybill (LPA NVD/Waybill), which upholds Australia's reputation as a world leader in meat and livestock food safety.

LPA is a simple on-farm food safety program, which enables producers to back up claims made on the LPA NVD/Waybills. When producers sign an LPA NVD/Waybill, they are showing their compliance with LPA.

LPA focuses on food safety management, which considers five key elements or areas of compliance; each with a food safety outcome aimed at ensuring meat from livestock is fit for human consumption. LPA is a vital component for effectively managing on-farm risk. Most producers will find that they already meet the Livestock Production Assurance food safety outcomes and can prove this through current records.

An example of the LPA NVD/Waybill for cattle is provided in Tool 6.07.

### Collect and read abattoir feedback whenever possible

Feedback from abattoirs can provide an early warning of the incidence of disease in the herd. It is recommended that you collect and read abattoir feedback whenever possible.

### Seek veterinary advice for unexplained health problems

If an uncommon or unexplained health problem occurs, seek professional advice from your local veterinarian or state department of primary industry and agriculture. In these cases your records provide crucial information.

Also check that there are no toxic plants or contaminated feeds accessible to your herd. A selection of references for the identification of toxic plants and noxious weeds is included in **Tool 6.09**.

**IF YOU SUSPECT AN EXOTIC DISEASE, DIAL THE EMERGENCY ANIMAL DISEASE HOTLINE 1800 675 888**

### **What to measure and when**

Regularly observe your animals grazing behaviour. Make records of:

- feedbase/vegetation condition during water runs and animal condition scores when mustering and bringing cattle into yards
- cow reproductive performance including pregnancy rate, dystocia rate and calving percentage
- any diseased, or deceased, animals
- information on identification and/or management of noxious weeds and toxic plants
- information collected from abattoir feedback, whenever this information is available.





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## Guidelines for preventing the introduction of infectious diseases

The establishment of biosecurity procedures for introduced stock is an important practice to prevent the transfer of infectious diseases onto the property.

The procedures that keep infectious diseases, pests and weeds off a property are often documented in a farm biosecurity plan.

There are two parts to a property biosecurity plan:

- measures to reduce the risk of introducing an infectious disease, pest or weed onto the property
- measures to reduce the risk of spreading an infectious disease, pest or weed within a property.

The principles of quarantine and risk assessment need to be applied in the day-to-day operation of a pastoral property.

## Reduce the risk of introducing an infectious disease

Quarantine introduced stock to prevent transfer of infectious diseases.

Assess the risk of introducing an infectious disease before bringing new animals onto the property. **Tool 6.10** is designed to help assess the likely risk of introducing diseases such as bovine Johne's disease (BJD) and mucosal disease bovine (pestivirus or bovine viral diarrhoea virus - BVDV) into a herd.

Local veterinarians or state departments of primary industries and agriculture can also provide advice on preventing the introduction of infectious diseases. A simple phone call can help to avoid introducing a serious disease into your herd. **Tool 6.11** is a cattle disease guide to provide to assistance in assessing the disease status of cattle before being introduced into your disease-free herd.

Check the disease risk of all introduced cattle. In principle:

- only purchase stock known to be free of infectious diseases
- where appropriate, quarantine all introduced animals until you are sure they are disease-free

As an overall disease prevention strategy, implement a biosecurity plan for the property by:

- ensuring boundary and internal fences are stock proof
- quarantining all introduced cattle, with the length of quarantine dependent on the disease
- restricting use of yards and handling facilities to your own stock.

## Reduce the risk of spreading an infectious disease

If you suspect, or can confirm, that an animal is showing symptoms of a notifiable disease it must be reported to a local vet or by phoning the Emergency Animal Disease Watch Hotline on 1800 675 888.

Continually monitor your livestock for signs of disease. **Tools 6.02** and **6.04** provide diagnostics to detect diseases. **Tool 6.11** can help you diagnose disease status.

Local veterinarians or state departments of primary industries and agriculture can also provide advice on preventing the spread of diseases.

## What to measure and when

- Assess the risk of introducing infectious diseases into your herd. **Tool 6.10** covers BJD and mucosal disease (bovine pestivirus or bovine viral diarrhoea virus - BVDV).
- If there is a risk, know the symptoms of common diseases and carefully check all cattle introduced onto the property.
- If your herd contracts an infectious disease, take immediate action to prevent the disease spreading (see **Tool 6.13**).
- If you suspect a notifiable disease, the full list of which is available from the **Department of Agriculture**, report it to your local vet or phone Emergency Animal Disease Watch Hotline on 1800 675 888.

## Further information

- Information on diseases, deficiencies and toxicities and strategies to prevent the disease, or plant, from being introduced onto your property is available on all state departments of primary industries and agriculture websites.
- **MLA** has biosecurity information available under the **Livestock Production** section of its website.
- The **Animal Health Australia** website provides a range of information on diseases, including BJD.

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### Guidelines for managing the welfare of your cattle herd

Animal welfare management is a critical component of whole property management.

Producers have a duty of care to their livestock.

Review all factors that affect cattle welfare and wellbeing. **Tool 6.12** outlines a checklist of all important factors potentially affecting cattle welfare on-property.

- Check all health, nutrition, climatic and management factors that can affect cattle welfare
- Use appropriate and efficient stock handling methods and well-designed facilities that exploit cattle's natural behaviour.

### Meet nutrition targets for all cattle classes

Ensure stock maintain recommended condition score targets or weights for their class.

Generally, cattle should be maintained at body condition score 2.5 or above to achieve satisfactory reproductive performance and welfare requirements. (see **Module 2: Managing your feedbase** and **Module 5: Maximising weaner throughput**).

### Keep animals free from important diseases

Basic animal welfare standards include freedom from disease. All diseases need prompt diagnosis and treatment.

Major diseases can be well controlled with an integrated approach to management. See **Procedure 2** and the tools in this module for further information.

### Follow national and state codes of practice

Follow the **Australian Animal Welfare Standards and Guidelines**.

Some states may also have specific requirements in relation to keeping livestock. Contact your state department of primary industry and/or agriculture for further information.

It is essential that producers are aware of the various codes of practice, guidelines and requirements set down nationally and state-by-state and that they are adhered to.

Follow all relevant codes of practice to ensure all important animal welfare standards are being met.

### Follow guidelines for the transport of cattle

When transporting livestock, it is essential that they are managed in a way that reduces stress and minimises any risks to animal welfare.

It is also important that producers understand their roles and responsibilities when transporting livestock.

Cattle should be transported in accordance with the guidelines outlined in the **Australian Animal Welfare Standards and Guidelines for the Land Transport of Livestock**.

### Undertake routine husbandry procedures correctly

When performing routine husbandry procedures are conducted on all stock:

- plan husbandry procedures to minimise stock handling, reduce stress to livestock and maximise disease control
- Wcombine procedures so cattle are handled less frequently where possible
- ensure the correct techniques and procedures for invasive husbandry procedures that cause pain, such as castration or dehorning are followed. Such procedures include adhering to age guidelines and taking care with hygiene. See the *Further information* section for specific information on these procedures.
- ensure people handling livestock are skilled and competent to do so effectively. If the necessary skills are not available through on-property labour, consider accredited contractors (such as members of the **Livestock Contractors Association**). It is important animal handlers are technically competent to ensure appropriate health and welfare standards are met.

### Manage breeding heifers to minimise dystocia

While some neonatal calf losses are likely, they can be significantly reduced through good management practices.

Good heifer management including management of nutrition to ensure heifers are well grown but not too fat (see **Module 5: Maximising weaner**

throughput) and careful use of genetics in selection of bulls and heifers (see **Module 4: Cattle genetics**) help to minimise dystocia.

### **Develop a disaster management plan**

Develop and implement a disaster management plan when cattle come under increased stress from naturally occurring events, such as drought or flood.

This package does not contain detailed drought feeding information, however extensive and detailed assistance is available from state departments of primary industries and agriculture and private consultants. Various decision support tools and training such as StockPlan<sup>®</sup> are also available which enables producers to explore options during a drought and to make informative and timely decisions before the onset of drought.

Issues that should be considered in a disaster management plan include:

- feed and water options
- cost to feed and/or water stock for a specified times
- feeding, selling or agistment strategies
- impact of decisions on the herd and finances, both immediatly and following years
- buy or breed in the recovery phase

Monitor all retained herds body condition closely to ensure they do not fall below condition score 2-2.5, as this will adversely affect their welfare and performance.

The aim of a disater management plan is to allow producers to make management decisions that minimise the adverse cattle welfare, environmental, personal and financial impacts of natural events and minimise the recovery time.

### **Design an effective livestock handling system**

Keep cattle handling to the minimum level necessary for health management and productivity.

Design handling facilities (eg. yards and laneways) to minimise the risk of injury to cattle and to take advantage of natural cattle behaviour. Some important features include:

- Design yards to ensure a smooth flow of stock.
- Avoid shadows, which can cause cattle to balk, in yards .
- Use materials that do not make a noise and are designed to avoid potential injury to cattle.
- Maintain cattle handling facilities in good working order and complete repairs well before major husbandry practices are carried out.
- Cattle that are familiar with particular directions in yards tend to move better. They also remain calmer if they can see and hear other cattle.

### **Use low stress stock handling techniques**

Stockmanship is a broad term that encompasses the expertise of people involved in handling stock.

Cattle handling methods are very important for ease of movement, increased productivity, reduced occupational health and safety issues and animal productivity.

Understanding cattle behaviour is an important part of good stockmanship and improves a handler's ability to move stock whilst minimising stress. Poor stockmanship can result in bruising, carcass downgrades and dark cutting meat.

Low stress stock handling techniques increase productivity and improve meat quality. Courses are available through state departments of primary industries and agriculture as well as private training providers. Search on-line for 'low stress stock handling' for further information.

### **Heat Stress**

Heat stress occurs when an animal has excess body heat that it cannot lose.

Heat stressed cattle eat and ruminate less, seek shade, or if no shade is available align themselves with the sun, breath with their mouths open, pant, salivate and splash water if it is available. Cattle will lie down and die if body temperature reaches 41.5°C.

Cattle with quiet temperaments are less likely to become excited and overheat. Steady mustering and low stress stock handling reduce the chance of cattle becoming agitated. Rest during mustering particularly helicopter mustering gives cattle an opportunity to settle down, decrease body heat production and improve heat loss.

Fat cattle have a greater risk of heat stress due to excess body fat acting as insulation and slowing down body heat loss. It is also harder for the heart to pump around oxygenated blood to the vital organs. Certain breeds, such as *Bos indicus*, have certain attributes which makes them better adapted to hotter conditions including shorter coats, longer dewlaps and more sweat glands which enable them to lose more heat.

Cattle suffering from an existing health issue are less able to cope with heat.

The risk of heat stress can be reduced by:

- shaded yards, provided their structure does not interfere with air flow through the yards
- provision of cool fresh water
- allowing room in yards and pens for cattle to spread out enough to maintain airflow and allow more effective body heat loss
- handling and transport of cattle during the cooler hours of the day
- not overloading trucks
- loading cattle that are more susceptible to heat stress on the shaded lower decks of trucks
- providing electrolytes when handling and transporting cattle during hot weather as this will enable the animal to replace body salts and fluids more effectively.

### **What to measure and when**

- Review all aspects of cattle welfare on-farm including relevant codes of practices, animal husbandry procedures, disaster management plans and on-property handling facilities on a regular (eg. quarterly) basis.

### **Further information**

- *Is it fit to load?*

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The table below will help you identify the conditions likely to influence the development of widespread diseases that can lead to significant economic loss when left untreated, or treatment is delayed.

Management strategies (see Tool 6.03) should be adopted if conditions for the development of disease on your property eventuate to avoid losses.

Disease	Conditions when likely to occur
<b>Bloat</b>	<ul style="list-style-type: none"> <li>■ More likely to occur on legume dominated pasture in rapidly growing vegetative stage, in a highly digestible feedbase with low percentage of dry matter e.g. native clovers and native verbine.</li> <li>■ Intensive feed ration (mainly in feedlot or drought feeding) with low fibre component (&gt;80% of ration as grain).</li> </ul>
<b>Pimelea poisoning</b>	<ul style="list-style-type: none"> <li>■ Accidental consumption of toxic varieties of the native pimelea plant.</li> <li>■ Inhalation of plant dust can also cause poisoning.</li> <li>■ High risk periods are between August and December.</li> </ul> <p>Conditions that favour the outbreak include:</p> <ul style="list-style-type: none"> <li>■ low summer rain the previous year</li> <li>■ good autumn and early winter rain</li> <li>■ low spring/summer rain with a feed shortage</li> <li>■ land with little perennial feedbase.</li> </ul>
<b>Ketosis (pregnancy toxemia)</b>	<ul style="list-style-type: none"> <li>■ Late pregnant cows in last six weeks of pregnancy grazing dry poor quality pasture.</li> </ul>
<b>Calf scours (neonatal calf diarrhoea)</b>  Caused by a number of infectious microbes including viruses <i>Rotavirus</i> and <i>Coronavirus</i> , Protozoa including <i>Cryptosporidia</i> and <i>Coccidiosis</i> and bacteria including <i>Salmonella sp</i> and a variety of strains of <i>E coli</i> .	<ul style="list-style-type: none"> <li>■ Healthy young calves often carry pathogens and amplify environmental contamination and adult cows can be asymptomatic carriers of pathogens that infect young calves.</li> <li>■ All major pathogens can survive in the environment, especially when it is cool and damp.</li> <li>■ Close contact, poor hygiene and high stocking rates of young calves are likely to increase the risk of infection.</li> <li>■ Infections are likely to be more severe when herd nutrition is poor and calves receive low levels of colostrum. Calves should consume 10% of their bodyweight in colostrum in the first 24 hours of life.</li> <li>■ Calving heifers on the same area every year should be avoided and cows and calves removed from contaminated areas to reduce the risk of infection of young calves in the face of an outbreak.</li> <li>■ New cattle should not be exposed to calves in case they carry new pathogens.</li> </ul>

### Infectious reproductive diseases

While some reproductive diseases have highly visible consequences, such as late-term abortions, many work silently with the result unseen for weeks or months.

If there has been a dramatic reduction in pregnancy, branding or weaning rates, or major changes in calving distribution patterns, in the absence of a drought or a seasonal feed shortage situation, the producer should consider that reproductive disease may be present and arrange for veterinary investigations to be done.

In the case of diseases like vibriosis and trichomoniasis, failure to investigate, and act, may mean that herd fertility could be lower in the following year as well.

Assess the risk of diseases based on previous local history (seek information from veterinarian, state government officers and local consultants) and if available, property history/p>



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The cattle disease guide can aid in diagnosis. It is recommended that producers consult a veterinarian to confirm diagnosis.

[Access the cattle disease guide](#)

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This table presents key management strategies that can be adopted to prevent specific diseases.

Disease	Management strategy to prevent disease
<b>Bloat</b>	<ul style="list-style-type: none"> <li>■ Avoid grazing high-risk pasture with a high proportion of actively growing legumes in vegetative growth by strategic use of grazing management and paddock selection.</li> <li>■ Use bloat capsule if grazing high risk pastures for extended period.</li> </ul>
<b>Pimelea poisoning</b>	<ul style="list-style-type: none"> <li>■ Monitor cattle and the feedbase to minimise contact with poisonous pimelea plants, particularly between August and December. Check for loose faeces around watering points.</li> <li>■ Be aware of the climatic conditions that lead to high risk years.</li> <li>■ Lightly stock paddocks containing pimelea, as competition from other species may make it difficult for the pimelea plant to spread.</li> <li>■ Graze affected paddocks when pimelea is green, as it is unpalatable to cattle at this stage in the growth cycle.</li> <li>■ Do not overgraze paddocks as this may force cattle to eat pimelea or graze pimelea that is growing closely with other palatable plant species. Cattle will still eat green pimelea if they are hungry.</li> <li>■ Graze affected paddocks with sheep where possible .</li> <li>■ Avoid disturbing soil in paddocks with pimelea as this promotes seed germination and new plant growth.</li> </ul>
<b>Ketosis (pregnancy toxemia)</b>	<ul style="list-style-type: none"> <li>■ Avoid grazing cows on pasture where rapid weight loss is likely in late pregnancy, or supplement to avoid rapid weight loss.</li> <li>■ Avoid grazing conditions that allow cows to become too fat (&gt;FS3.5–4) or too thin (&lt;FS2–2.5) in late pregnancy.</li> </ul>

### Reproductive diseases

Disease	Management strategy to prevent disease
<b>Vibriosis</b>	<ul style="list-style-type: none"> <li>■ If security of paddocks is maintained, annual vaccination of bulls can give adequate herd protection (this approach is preferable for extensive herds).</li> <li>■ If cattle security cannot be maintained, all breeding cattle in the herd should be vaccinated initially. Thereafter, the most cost effective approach is to vaccinate all replacement heifers and bulls annually.</li> <li>■ Culling all empty breeders at a pregnancy testing will greatly reduce the prevalence of the disease, but pregnant animals may still be carriers of the disease.</li> <li>■ Vaccinate all introduced bulls.</li> <li>■ Reducing the age of bulls (to less than seven years), bull control and seasonal mating also facilitates disease control.</li> </ul>
<b>Trichonomiasis</b>	<ul style="list-style-type: none"> <li>■ Heifer segregation and mating with young bulls can be used as a control strategy.</li> <li>■ Controlled mating (3–6 month joining period) provides sexual rest of cows.</li> <li>■ Cull infected bulls.</li> <li>■ Reducing the age of bulls, bull control and seasonal mating also facilitates disease control.</li> <li>■ No commercial vaccine is available.</li> </ul>
<b>Mucosal disease (bovine pestivirus or bovine viral diarrhoea virus - BVDV)</b>	<ul style="list-style-type: none"> <li>■ Ensure replacement heifers develop a strong immunity before joining.</li> <li>■ A vaccine is now available to control the disease.</li> </ul>

Seek advice on appropriate short-term treatments and long-term prevention strategies for all diseases.



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The diagnosis of most diseases listed is likely to require advice and assistance from your veterinarian.

Disease	Diagnostic tool
<p><b>Clostridial diseases</b></p> <p>Clostridia are anaerobic, spore-forming bacteria widely distributed in nature, particularly in soil. They form resistant spores under stress. These spores and the powerful toxins produced are central to the medical importance of these bacteria.</p>	<p>Clinical signs of clostridial diseases:</p> <ul style="list-style-type: none"> <li>■ Tetanus - convulsions initially stimulated by sound or touch that gradually progress in severity.</li> <li>■ Black leg - severe lameness, swelling on affected leg, depression, fever, dry and cracked skin, sudden death.</li> <li>■ Black disease - profound depression, abdominal pain, sudden death.</li> <li>■ Malignant oedema - contaminated wound often associated with calving, local swelling, fever, severe toxæmia and death.</li> <li>■ Pulp kidney - convulsions, sudden death.</li> </ul>
<p><b>Botulism</b></p>	<p>Clinical signs include:</p> <ul style="list-style-type: none"> <li>■ progressive paralysis</li> <li>■ stiff gait</li> <li>■ muscular weakness</li> <li>■ uncoordination</li> <li>■ saliva drooling from mouth</li> <li>■ unable to rise and breathing becoming progressively more laboured</li> <li>■ extended hind legs extended</li> <li>■ tongues that hang out and do not retract when pulled.</li> </ul> <p>Animals affected early in the outbreak will likely die within 12-24 hours, but later in the outbreak animals can live longer and sometimes survive.</p> <p>Post-mortem may reveal the omasum to be compacted and dry. Bones or other carrier substances may be found in the stomach.</p> <p>There are several tests available to show if toxic bacterium are present or to show animals have antibodies but they do not prove that a beast has botulism, or has died from it.</p>
<p><b>Vibriosis</b></p>	<p>Clinical signs include:</p> <ul style="list-style-type: none"> <li>■ early embryonic death that shows up as early return to service</li> <li>■ spread out calving</li> <li>■ very poor pregnancy rates (often less than 50% pregnancy).</li> </ul> <p>Vibriosis will affect all age groups if recently introduced, heifers are the most affected in herds where the disease is endemic.</p> <p>Testing can be done with preputial scrapings, for bacterial culture, taken from the prepuce of a bull under instruction from a veterinarian. A vaginal mucous ELISA test through your veterinarian can detect antigen presence using a vaginal swab, this is a mob test.</p>
<p><b>Leptospirosis</b></p>	<p>Clinical signs include:</p> <ul style="list-style-type: none"> <li>■ late-term abortion and stillborn calves</li> <li>■ weak, stunted or deformed calves</li> <li>■ decline in quantity and quality of milk</li> <li>■ occasionally mastitis</li> <li>■ bloody, port-wine coloured urine</li> <li>■ rough, dry coat.</li> </ul> <p>Cows can be tested with paired bloods for serological testing on both affected and unaffected</p>

	<p>cows.</p> <p>Calves and aborted foetuses can be tested for bacteriological isolation of the organism.</p>
<p><b>Mucosal disease (bovine pestivirus or BVDV - bovine viral diarrhoea virus)</b></p>	<p>Clinical signs can vary from mild diarrhoea to chronic ill-thrift and wastage in cattle up to 18 months to sudden death of cattle and the signs exhibited will depend on the strain of virus and time of infection.</p> <p>If foetuses of naive pregnant females are infected in-utero, immune incompetent calves can become persistently infected (PI) and will usually succumb to infection between six months and two years of age.</p> <p>PI cattle spread the viral infection within and between herds.</p> <p>The diagnosis of mucosal disease will require veterinary input to assist in diagnosis with autopsy, serological testing and histopathology.</p>
<p><b>Pinkeye</b></p>	<p>Clinical signs include:</p> <ul style="list-style-type: none"> <li>■ increased tear production and weeping eye/s</li> <li>■ cloudy cornea (surface of the eye) becoming pink or yellow if more severe</li> </ul> <p>Some eyes recover but others are left with a permanent scar and the animal will have no vision from affected eyes. Infected animals lose weight and may be completely blind if both eyes are affected.</p> <p>Bacteriological testing can confirm the cause of pinkeye. <i>Moraxella bovis</i> the most common cause.</p>

## Setting directions

**Note:** The information contained in these pages is intended as a general guide only. Always obtain professional advice about your specific situation.

Vaccines include:

- Clostridial vaccines prevent mortality against black leg, black disease, tetanus, pulpy kidney and malignant oedema.
- Vibriovax<sup>®</sup> protects against campylobacter infection in breeding cows that can cause infertility and abortion.
- Leptospirosis vaccine protects against abortion, calf deaths and reduces shedding of leptospira bacterium and consequently the risk of human infection.
- Pestigard<sup>®</sup> vaccine prevents reproductive wastage and mortalities caused by mucosal disease or pestivirus.
- Piliguard<sup>®</sup> vaccine prevents pinkeye caused by *Moraxella bovis*.
- Botulism vaccines protect against mortality caused by *Clostridium botulinum* Types C and D

This table is used to help identify conditions and vaccines used to prevent the development of common diseases that can lead to significant economic loss when left untreated.

Clostridial disease	Conditions when likely to occur	Vaccine
Tetanus	Penetrating wound including marking wounds	<ul style="list-style-type: none"> <li>■ Ultravac<sup>®</sup>5in1</li> <li>■ Websters<sup>®</sup>5in1vaccine for cattle and sheep</li> <li>■ Websters<sup>®</sup>5in1vaccine with vitamin B12 for cattle and sheep</li> <li>■ Websters<sup>®</sup>low volume 5in1vaccine for cattle and sheep</li> <li>■ Tasvax<sup>®</sup>5in1</li> <li>■ Tasvax<sup>®</sup>8in1 which include additional strains of <i>C. perfringens</i> and <i>C. haemolyticum</i></li> </ul>
Black leg	Muscle bruising, growing animals	
Black disease	Liver fluke infestation	
Malignant oedema	Wounds	
Pulpy kidney	Lush pasture, heavy grain feeding, change feed	
Botulism	Phosphorus and protein deficiency which causes carcass and bone chewing. This can be habit forming behaviour and animals can continue to chew bones even when protein and phosphorus are adequate.	<ul style="list-style-type: none"> <li>■ Websters<sup>®</sup>low volume bivalent botulinum vaccine for sheep and cattle</li> <li>■ Ultravac<sup>®</sup>botulinum vaccine</li> <li>■ Longrange<sup>®</sup> botulinum vaccine</li> <li>■ Singvac<sup>®</sup>2 year single shot botulinum vaccine for cattle</li> <li>■ Singvac<sup>®</sup> 3 year single shot botulinum vaccine for cattle</li> </ul>

With all clostridial disease, consider the local risk based on previous local district history and if available property history. Intensification is likely to increase risk of clostridial diseases such as blackleg or pulpy kidney.

Disease	Conditions when likely to occur	Vaccine
Vibriosis	Venereal infection, likely to occur when cattle (bulls, mated heifers, cows) introduced to breeding herd, particularly from unknown origin.	<ul style="list-style-type: none"> <li>■ Vibriovax<sup>®</sup></li> </ul>
Leptospirosis	<p>Imported cattle or neighbouring cattle likely to introduce disease.</p> <p>Properties trading cattle in conjunction with a breeding herd are at higher risk.</p>	<ul style="list-style-type: none"> <li>■ Cattlevax<sup>®</sup>LC 7in1</li> <li>■ Leptoshoield<sup>®</sup></li> <li>■ LeptoVax<sup>®</sup></li> <li>■ Ultravac<sup>®</sup>7in1</li> </ul>

	<p>Cattle have contact with wildlife reservoirs such as feral pigs.</p> <p>Previous history of leptospirosis in herd.</p> <p>Cattle have access to wet areas where leptospirosis bacteria survive.</p> <p>Workers and veterinarians will be at risk if handling cattle shedding bacterium.</p>	<p>■ Websters®Clepto-7</p>
<p>Mucosal disease (bovine pestivirus or BVDV - bovine viral diarrhoea virus)</p>	<p>Close contact between cattle.</p> <p>Cattle shedding virus introduced to herd, or persistently infected cattle already present in herd infect susceptible cattle in early pregnancy.</p> <p>Breeding herds are most at risk if other cattle are brought onto property or they have access to other cattle.</p>	<p>■ Pestigard® vaccine</p>
<p>Pinkeye</p>	<p>Young cattle especially in close contact such as around watering points and dusty yards or supplementary feeding. Flies and dust are likely to spread the conditions and cattle in poor condition are more susceptible.</p> <p>Introduced cattle or herds that trade a lot of cattle are likely to be at more risk, especially if they have no previous exposure.</p>	<p>■ Coopers® Piliguard®</p>

**Important considerations when vaccinating cattle:**

- Follow the manufacturer's instructions closely.
- Store and handle vaccines correctly to ensure the effectiveness of the vaccine is not reduced.
- Carefully adhere to safety precautions for workers handling vaccines and associated equipment.
- Dispose of used equipment safely, avoiding environmental contamination.
- To optimise the immunity gained ensure animals are in good health.
- Full protection does not occur until up to four weeks after the initial doses of the vaccine.



## Setting directions

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This table outlines zoonotic diseases, which are those that can infect both cattle and people.

**Seek medical advice immediately if there is a disease, or suspected disease, outbreak.**



## Setting directions

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View an image of the Livestock Production Assurance National Vendor Declaration and Waybill

### Further information

- More information on LPA and the LPA NVD Waybill is available on the MLA website

## Setting directions

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- State departments of primary industries and agriculture, as well as other government bodies.
- Private veterinarians and consultants.
  
- MLA has a range of publications on diseases and beef cattle health including:
  - Tips & Tools: Preventing calf scours in suckler beef enterprises
  - Tips & Tools: Treating calf scours
  - Phosphorus management of beef cattle in northern Australia

### Further information

Reference books available from libraries or online suppliers such as:

- *Diseases of Livestock* by TG Hungerford, 1990, McGraw-Hill, Sydney.
- *Livestock Diseases in Australia* by T Brightling, 2006, CH Jerram & Associates, Mt Waverley, Victoria.
- *Stock Diseases* by A Brightling, 1994, Inkata Press, Sydney.
- *Diseases of Cattle in Australasia* by TJ Parkinson, JJ Vermunt and J Malmo, 2010, VetLearn, Wellington, New Zealand.

## Setting directions

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Information on toxic plants and noxious weeds present in your area is available through your local private veterinarian or consultant or relevant state government authority.

### Further information

Reference books, such as those listed below, are available from libraries or online suppliers.

- *Poisonous Plants of Australia* by S Everist, 1981, Angus & Robertson, Sydney.
- *Poisonous Plants: A handbook for farmers and graziers* by EJ McBarron, 1983, Inkata press, Melbourne.
- *Medical and veterinary aspects of plant poisoning in New South Wales* by EJ McBarron, 1976, NSW Department of Agriculture, Sydney.
- *Australia's poisonous plants, fungi and cyanobacteria – A guide to species of medical and veterinary importance* by Ross McKenzie, 2012, CSIRO Publishing, Collingwood, Victoria.
- *Understanding Pimelea Poisoning of Cattle* edited by Anne Collins



## Setting directions

The table below is designed to help minimise risk of introducing the infectious diseases bovine Johne's disease (BJD) and mucosal disease (bovine pestivirus) into a beef herd.

Disease	Risk assessment
<b>Bovine Johne's disease (BJD)</b>	<ul style="list-style-type: none"> <li>■ Purchase cattle from low-risk (Free and Protected) zones, maps for these areas are available from state departments of agriculture and Animal Health Australia. In Control and Residual zones, BJD is common in dairy herds but uncommon in beef herds that have had little or no contact with dairy cattle.</li> <li>■ Observe regulations with regards to the movement of cattle between BJD zones and states.</li> <li>■ Source replacement animals from Market Assurance Program (MAP) assessed herds.</li> <li>■ Do a Check Test.               <ul style="list-style-type: none"> <li>■ A Check Test requires 50 adults to be tested, or all adults over two years if there are less than 50 in the herd, and is valid for 12 months.</li> <li>■ They can only be used to support a Vendor Declaration of animals bred in that herd or for animals introduced with a vendor declaration as originating from Check Tested or higher status herd.</li> <li>■ In non-MAP herds with no suspicion of infection, it is possible to undertake a low level assurance test on selected adult animals in the herd aimed at increasing the probability of detecting infection.</li> <li>■ Additional testing procedures including Testing to MAP Standard (TMS) and Tested 4 year olds (T4YO) are sometimes used for cattle to gain entry to MAP MN1 herds.</li> </ul> </li> <li>■ Bring in Beef Only animals. Beef Only is a herd category to help assure cattle buyers about the very low risk of BJD in beef herds that have had no contact with dairy cattle. Find out more about the <b>requirements and declarations needed for buying and selling Beef Only animals</b>.</li> <li>■ Only introduce cattle to property if they are at a similar or higher status. On-property quarantine is not practical for controlling BJD given the long time delay for development of disease and low sensitivity of tests in individual cattle.</li> </ul>
<b>Mucosal disease (bovine pestivirus or BVDV - bovine viral diarrhoea virus)</b>	<ul style="list-style-type: none"> <li>■ For property that is sero-negative, only buy from sero-negative herds or cattle that have been tested negative PI (persistently infected).</li> <li>■ If buying only sero-negative or negative PI animals is not practical consider vaccination (check the cost benefit) or exposure of breeding animals well before joining to a known virus shedding PI animal.</li> <li>■ Purchase cattle from property with no history of trading, agistment or cattle turnover.</li> <li>■ Purchase of cattle from closed herds presents a lower risk but this is not a guarantee of freedom from pestivirus. It is important to remember that 90% of herds in Australia have some evidence of infection.</li> <li>■ Introducing any cattle to a closed breeding herd is high risk where the breeding herd may be naïve (haven't been exposed to virus).</li> <li>■ Do not introduce new cattle to a breeding herd in the early stages of pregnancy - this is a high risk action.</li> <li>■ If purchasing new cattle, keep them in isolation, and away from direct contact with breeding cows if they are pregnant (especially before 150–180 days gestation).</li> </ul>

When conducting a risk assessment, it is important to consider the individual property circumstances. For example, if trading cattle is an important component of an enterprise and there is no risk to a breeding herd, then disease introduction issues will not be the same as for a closed breeding herd or stud.

An initial quarantine area is appropriate for disease control for introduced stock. The length and type of quarantine necessary varies with different diseases and should be discussed with your veterinarian (quarantine may be necessary from a weed perspective too). Attention to secure boundary and internal fencing is an integral part of the strategy.

### Further information

- State departments of primary industries and agriculture

- Your local veterinarian
- Animal Health Australia

## Setting directions

The diagnosis of the diseases listed in Table 1 is likely to require advice and assistance from your veterinarian.

Table 1: Diagnostic tools to assess the bovine Johne's disease (BJD) and mucosal disease (bovine pestivirus) status of introduced cattle

Disease	Diagnostic
<b>Bovine Johne's disease (BJD)</b>	<ul style="list-style-type: none"> <li>■ An enzyme-linked immunosorbent assay (ELISA) serological (blood) test takes about three days and has a sensitivity of about 25–50% and about 1% false positives. It is suited to herd screening rather than individual testing.</li> <li>■ Faecal culture tests to detect bacteria is more accurate than ELISA tests (sensitivity 30–50% and 0% false negatives) and take 2-5 months depending on the culture method used.</li> <li>■ Post mortem examination followed by histopathology and culture of gut tissues may be undertaken on serological positive animals.</li> <li>■ No diagnostic tests are available for individual animals, or on a mob basis, that give a high level of assurance of freedom from BJD.</li> </ul>
<b>Mucosal disease (bovine pestivirus or bovine viral diarrhoea virus (BVDV))</b>	<ul style="list-style-type: none"> <li>■ There is a wide range of clinical signs depending on the strain of virus and time of infection. Signs can vary from mild diarrhoea to chronic ill-thrift and wastage in cattle up to 18 months to sudden death of cattle between six months and two years of age, and poor reproductive performance in breeding herd.</li> <li>■ Serological testing for presence of antibody and testing of serologically negative cattle for presence of virus (antigen) is available. In addition, ear notch or hairs samples can be used.</li> <li>■ The diagnosis of mucosal disease will require veterinary input to assist in diagnosis with autopsy, serological testing and histopathology.</li> </ul>

## Setting directions

Procedure	Comment	✓ or X
Read and adopt code of practice for welfare of cattle.*	Have all guidelines been followed for your property?	
Read and adopt code of practice for transport.*	Have all guidelines been followed for your property. including not exceeding the time cattle are off water for transport?	
Read and adopt code of practice for animals at saleyards.*	Have all guidelines been followed for your property including not exceeding the time cattle are without access to water?	
Read and adopt the guidelines in the publication <i>Is it fit to load?</i> .	Have all guidelines been followed and do you ensure cattle unsatisfactory for transport are not loaded?	
Ensure cattle meet condition score targets.	Have condition score targets been met?	
Ensure adequate water (quality and quantity) been provided to cattle.	Do you need to contact the relevant state departments for information on water quality?	
Adopt selection to move to a polled herd.	Are cattle selected for polledness, to eliminate welfare issues and carcass damage?	
Monitor cattle, including nutrition, deaths and other signs, and have trigger points to investigate disease before they cause significant problems.**	Is the mortality rate <2% for all classes of stock?	
Adopt efficient husbandry procedures. Combine management events to minimise handling, follow codes of practice.*	Have management systems that prevent impact of diseases been adopted?	
Manage calving cows to optimise productivity.*	Are heifers managed to minimise dystocia and provided adequate nutrition?	
Plan for managing severe climatic events.*	Have you developed contingency plans for fire, floods and droughts?	
Incorporate features of animal behaviour into handling systems to minimise stress.*	Do you and staff continue to develop expertise in animal handling and management?	

\*Refer to Procedure 5 for a list of relevant codes, guidelines and publications.

\*\*Refer to Procedure 1, Procedure 2 and Procedure 3.



## Setting directions

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Access a list of information resources.



## Setting directions

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Although NLIS is a national system, State and Territory regulations may differ slightly. Contact your local authority about NLIS regulations, property identification code (PIC) registration and ordering devices.