

Final report

Guide to developing an animal health management plan for pre-export premises

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Introduction

Healthy animals have better welfare outcomes and are more productive and profitable than unhealthy animals.

Development of an animal health management plan is essential for any animal-based business. The plan should be developed in consultation with a veterinarian and reviewed at least annually. The document will provide a framework for prompt disease identification and prevention as well as control and response strategies. A unique plan should be specifically developed for each business.

For a pre-export premises, there are many animal health risk factors that are largely beyond the control of the premises due to the nature of the business – for example, the aggregation of stock from many sources by agents and exporters. Planning, however, will help to mitigate these risks, and allow for the development of appropriate procedures to respond to disease events if they occur. Appropriately skilled staff and good facilities are also critical factors for good animal health outcomes.

Note that this guide is concerned primarily with herd- or flock-level animal health problems:

- Infectious diseases, caused by bacteria, viruses and other microorganisms
- Parasitic diseases, caused by multicellular organisms such as worms, flies and ticks
- Metabolic diseases, such as nutrient deficiencies or poisonings
- Injuries, where a risk factor in the environment may predispose to multiple animals being affected (such as lameness due to slippery pen floors)

Many of the diseases that commonly affect livestock are caused by infectious agents that are present within normal animals showing no sign of disease, or are generally present in the environment. Disease occurs when there is a change of situation that allows these infectious agents to multiply and then cause disease. The change of circumstance can include a sudden change in diet, severe weather conditions and stress.

Signposts

- An excellent reference is the [Veterinary Handbook for Cattle, Sheep and Goats](#) developed by LiveCorp and MLA. It is recommended that this reference be utilised in the development of your Animal Health Management Plan and to provide specific information about each disease and condition.

1. Identification of the animal health and welfare risks

Consultation with a veterinarian will help the premises to identify conditions that are more likely to occur in the local area. The main diseases to be expected in animals at pre-export premises may be divided into eight groups:

- a. Diet-related conditions
- b. Bovine respiratory disease
- c. Gastrointestinal disease
- d. Parasite infestations
- e. Eye conditions
- f. Skin conditions
- g. Lameness
- h. Sudden death
- i. One-off problems

a. Diet-related conditions

Failure to adapt to diet change

Some diseases are related to diet, in particular the diet adaptation process of pre-export premises. Many animals will arrive at the facility from a purely pasture-fed background and will need to be moved onto a total hard-feed diet ready for shipping. This adaptation process is vital in maintaining good animal health. Animals that fail to adapt quickly may develop inanition, acidosis, bloat or founder. These conditions vary in severity, with some animals recovering without treatment, recovering after veterinary intervention, or dying. Animals that do survive such conditions are unlikely to be fit for export. Poor adaptation procedures can result in large numbers of animals affected.

Pre-export facilities should develop a protocol for introducing new stock to the export feeding regime. This should include the following principles:

- The procedures should be followed strictly by staff to ensure there is no inadvertent increase in concentrate ration before the animals have had time to adapt.
- Periods of time 'off feed' should be minimised, and care taken to ensure animals do not have the ability to gorge.
- Livestock in this transition phase should always have access to good quality water and hay and roughage.
- Livestock that are in this adaptation phase should be subject to increased surveillance so that any failure to adapt is recognised and treated early. Signs that an animal is not adapting well may include scouring, inappetence, lameness, colic and depression.
- Animals that are unwell should be moved to the hospital pen so they can be treated appropriately.

Signposts

- [Veterinary Handbook for Cattle, Sheep and Goats – Inanition](#)

Contaminated feed

Feed may be contaminated prior to feeding out or through feeding into a contaminated environment such as directly onto the ground or into dirty feed troughs. Feed should always be provided to animals off the ground and away from moisture, dust and high contamination risk areas such as under trees (bird droppings), truck-cleaning facilities or waste piles. Feeding troughs should be kept clean, free from faecal and urinary contamination and from moisture or dirt. Old accumulated feed should be removed before new feed is supplied. Care not to spill feed will help to stop grazing from the dirt.

On occasions feed may become contaminated with carcasses of other animals such as rodents, birds and reptiles. This feed should not be provided to livestock. Moisture-affected feed is also potentially very dangerous to livestock and should be disposed of and not fed out.

Other diet-related conditions

There are a number of poisonings and nutritional deficiencies that can occur from poorly formulated and prepared diet. Poisoning can occur when there has been accidental contamination of feed with a poison or when normal feed constituents have been added in excessive amounts or there has been inadequate mixing.

There are also many nutritional deficiencies that can affect livestock. These occur because of improper feed formulation calculations or poor storage of feed allowing deterioration.

b. Respiratory diseases

Unstressed, pasture-raised cattle rarely suffer from bovine respiratory disease. It is however the most common disease affecting cattle that are lot fed in Australia and is an important disease that must be managed during long haul livestock export. BRD can be a significant issue for pre-export premises. Animals are most commonly affected in the first few weeks after introduction onto the premises.

BRD is caused by various infectious agents in combination with stress. Mixing of cattle from different sources both increases stress (which reduces the animal's immune system) and exposes animals to infectious agents to which they have not previously been exposed.

Viral infectious agents tend to affect the lungs first, causing damage to the respiratory tissues and impairing natural defences. Bacterial proliferation and further lung damage and pneumonia then develop.

Some key measures to reduce respiratory disease are to decrease stress, improve animals' adaptation to the new environment and to consider vaccination. In many cases where there is long haul livestock export, cattle will be vaccinated for BRD.

Pneumonia can also cause significant mortalities in sheep and goats. Young stressed sheep have an increased susceptibility to pneumonia. Conditions which are hot, dry and dusty increase the likelihood of pneumonia in sheep and more cases are generally seen in the autumn and summer. Prolonged yarding or overcrowding will also increase the incidence of pneumonia. Affected sheep may have a nasal discharge and difficulty breathing with some coughing. Pneumonia in sheep is often caused by a combination of infectious agents and exacerbated by stress and environmental conditions.

Clinical pneumonia in goats is usually seen as a sequel to stress, such as long duration of transport, weaning, sudden changes in weather, or overcrowding. Animals become unwell with a reduced appetite and possibly with a nasal and ocular discharge. They may have difficulty breathing with occasional coughing.

Signposts

- [Veterinary Handbook for Cattle, Sheep and Goats – Pneumonia – Cattle](#)
- [Respiratory disease of export cattle – B.LIV.0248 final report](#)
- [Identifying the causes of mortality in cattle exported to the Middle East – W.LIV.0252 final report](#) (section 12.5 *Mitigating BRD risk in export livestock*, p177)

c. Gastrointestinal diseases

Intensively-fed animals may develop diarrhoea from a sudden change in diet or from an incorrect ration formulation. These may then go on to develop secondary viral or bacterial gastrointestinal disease.

Animals that have diarrhoea but are otherwise normal may not require treatment. If the animal is depressed, has sunken eyes, is not eating or has blood in its faeces, it requires further assessment and treatment.

Salmonellosis

Salmonellosis is a relatively common disease to affect animals during export. *Salmonella* are zoonotic bacteria and extreme care should be taken when working with animals infected with them. Animals that are stressed are particularly susceptible to *Salmonella* infections. These

bacteria live in the gut of some healthy animals, but under stress they can multiply and cause disease.

The *Salmonella* bacterium can also be found in the environment especially in areas that are subject to faecal contamination. Infected animals excrete large amounts of infectious agent in faeces, which can infect other animals directly or via contamination of feed, water, milk or objects such as water troughs. Salmonellosis is typically taken into the body through the mouth but on occasion infection can occur through the conjunctiva (eyes) or upper respiratory tract.

Animals that are most likely to be clinically affected by *Salmonella* are those that are stressed or immunocompromised such as very young, very old or pregnant animals.

The stress triggers that may precipitate clinical disease include:

- Transport, especially over long distances
- Sudden deprivation of food and or water
- Mixing of unfamiliar stock
- Crowding; high stocking rate
- Concurrent illness or injury
- Severe weather events or sudden changes in weather

Typically, clinically-affected animals have a high temperature, diarrhoea (possibly with blood and mucus) and, in some cases, sick female animals might abort. The transmission rate can be high especially for animals in a high stocking intensity situation where there is ongoing stress and high exposure to infected animals.

Another condition in sheep, persistent inappetence-salmonellosis-inanition (PSI) complex, may also occur but affects sheep more during shipping.

Sick animals need to be treated without delay. Early recognition of clinical signs will allow sick animals to be isolated to reduce the spread of infection and environmental contamination while allowing them to receive appropriate treatment and supportive care.

It is difficult to completely mitigate the risk of *Salmonella*, especially in pre-export facilities holding livestock that have been transported over long distances and where there is mixing of animal groups in a high stocking density environment.

Measures to reduce the risk of infection are based on reducing stress and managing exposure to infected animals and contamination of the environment.

Maintaining good disease records will assist in identifying sources of livestock that have had an historically higher than average number of *Salmonella* cases. Livestock from these sources may be considered not suitable for long distance haulage and export. Where possible, new arrivals at a premises (especially those that have travelled long distances) should be isolated and watched closely to ensure there is no evidence of disease, before they are moved into the main stock-holding areas.

Food and water sources should be inspected regularly to ensure freedom from faecal contamination. Contaminated feed should not be fed to livestock and troughs should be cleaned thoroughly if contamination is identified.

Every pre-export facility should develop a management plan in consultation with their veterinarian to install measures to minimise the risk of Salmonellosis in their livestock. The main points in the plan would include:

- Sourcing low risk animals
- Identifying and isolating high risk groups (long-distance travellers, those with extended time off food and water)
- Early detection, prompt isolation and treatment of clinical cases.

Signposts

- [Veterinary Handbook for Cattle, Sheep and Goats – Salmonellosis](#)
- [Salmonellosis control and best-practice in live sheep export feedlots – LIVE.112 final report](#)

Coccidiosis

Coccidiosis is caused by microscopic parasites known as protozoa. Infection does not always cause clinical disease, but it is more likely to do so in younger animals. It can also affect older animals when they are intensively housed, stressed and exposed to a highly contaminated environment. Animal may be affected severely and die if they have a high exposure to the parasite. The condition may be worse if the animals have concurrent problems such as worms, stress or poor feed adaptation.

Clinical signs of coccidiosis include acute scouring, sometimes with blood in the faeces, and straining. Coccidiosis can be treated with sulpha drugs and can be prevented with the inclusion of a coccidiostat such as monensin or lasalocid in the feed.

Signposts

- [Veterinary handbook for Cattle, Sheep and Goats – Coccidiosis](#)

Johne's disease

Johne's disease is a chronic infection that mostly affects the intestine and causes weight loss and death. The infection is caused the bacterium *Mycobacterium paratuberculosis*, which lives mainly in animal intestines, but can survive in the outside environment for months or years in the right conditions.

Animals infected with *M. paratuberculosis* may shed infectious material for months to years before they appear clinically unwell. An increase in stress can hasten the progression of the disease, with affected animals developing marked clinical signs with progression to weight loss and death.

Exporters can manage this risk by sourcing animals:

- Accompanied by a National Animal Health Declaration, which provides information about the health status of the animals (including Johne's disease status).
- That are healthy with no evidence of scouring.
- That are young (less than two years old).
- That are vaccinated against Johne's disease (depending on importing country protocols).
- From properties in drier areas (which are less likely to have significant Johne's disease infection rates)
- From flocks or herds that are part of a JD Market Assurance Program.

Signposts

- [Veterinary handbook for cattle, sheep and goats – Johne's Disease](#)

d. Parasite infestations

Livestock in pre-export premises may be affected by gastrointestinal worms, which can result in scouring, weight loss and even death. Worms usually affect younger sheep and cattle more than older ones as immunity develops with age. Goats do not develop immunity and are susceptible at any age.

Worms can potentially be a significant problem for a pre-export premises, especially in sheep and goats, so it is essential to develop a worm management plan in conjunction with the premises veterinarian. Stress and high stocking rates can precipitate widespread disease and losses in animals brought onto the premises with existing worm burdens. Incoming animals may also be carrying drench-resistant worms whose eggs will be excreted onto the pasture where they will remain indefinitely, making future control more difficult.

For these reasons, it may be good practice to drench all animals on arrival with a quarantine drench. Monitoring of worm egg counts may also be needed depending how long animals remain on the premises before export.

External parasites including lice, flies and ticks may also need to be managed. Lice are unlikely to be a problem in sheep that have been shorn, or in cattle, but they may proliferate on goats under stress. Buffalo fly is a particular problem for cattle in areas of northern Australia as it can cause unsightly lesions that will result in export rejection. In sheep, flystrike can be widespread within a flock and deadly, although it is not usually a problem where sheep are recently shorn.

Cattle tick carries tick fever and is therefore a major problem in a defined zone of northern Australia. The risk is highest where cattle from outside the tick zone are moved into the tick zone for pre-export preparation. Dipping and/or other measures may be required to provide protection.

It will be very important to observe withholding periods and export slaughter intervals where any drenches or external parasiticides are administered.

Under the ASEL rejection criteria, any visible external parasites or pinkeye will result in rejection from a proposed export consignment.

Signposts

- [Veterinary Handbook for Cattle, Sheep and Goats](#)

e. Eye conditions

Pinkeye

Pinkeye is a contagious eye infection affecting livestock. It can spread rapidly especially in dusty conditions and when animals are kept in high-density situations. The bacteria that cause pinkeye in cattle are different to the bacterium that causes the condition in sheep and goats. The infection is generally seen when there is bacterium present and environmental factors that result in some irritation or damage to the eye. Flies may also be involved in the spread of the bacterium between animals.

The infection causes damage to the affected eye/s and can result in blindness that is temporary or permanent and may result in rupture of the eye and/or long-term scarring. The blindness and obvious ocular scarring may make animals unsaleable and not suitable for export.

A pre-export facility should plan to reduce the risk factors associated with pinkeye. This include:

- Identifying cases in incoming consignments and either refusing to accept or isolating them
- Reducing stress
- Minimising dust
- Avoiding excessive crowding
- Choosing feeds that do not readily become an aerosol, such as finely cut hay, pellets that lose their form, or hay with thick fibrous stalks or grass seeds
- Management of fly populations
- Rapid identification of clinical cases allowing for isolation and appropriate treatment. Pinkeye can be a significant welfare issue for livestock.

Signposts

- [Veterinary Handbook for Cattle, Sheep and Goats – Pinkeye](#)
- [Antibiotic medication for the treatment of Infectious Ovine Keratoconjunctivitis \(IOK\) in pre-export feedlots: the pharmacology and clinical efficacy of in-water and in-feed oxytetracycline – W.LIV.0163 final report](#)
- [Detection, identification and treatment of infectious ovine keratoconjunctivitis \(pink eye\) in sheep from a Western Australian pre-export feedlot – W.LIV.0361 final report](#)

f. Skin diseases

Skin conditions such as scabby mouth of sheep or ringworm of cattle in a pre-export premises can be significant and will result in export rejection under ASEL. Although the lesions may not be particularly bothersome to the animal itself, they are very easily spread because of the close proximity of the animals.

Ringworm

Ringworm is a fungal infection. It is easily spread between animals that are in contact. It can also cause infection in humans, especially farm workers and ship hands. Ringworm is typically an infection of cattle but can be seen in sheep and goats on occasion. Young cattle are more susceptible to infection than older cattle.

Infection is more likely to occur in hot and humid conditions and spread is facilitated by animals in high-density situations. Although the infection has almost no impact on the health of the animal, lesions are unsightly and this can reduce the saleability of animals and result in rejection under the ASEL rejection criteria for cattle.

There is a carrier state for ringworm, so although there may be no clinical cases evident initially, with the change in environment, stress and high-density stocking associated with export, clinical cases can occur and spread quickly. The fungal spores can survive for extended periods in the environment.

Prevention is the best management tool and may include:

- Being careful not to allow animals with active lesions into the pre-export facility.
- Keeping cattle that develop ringworm during quarantine isolated from other cattle that are not affected, and when cattle handling is required, putting ringworm-affected cattle through the yards last.
- Minimising the number of times cattle are handled through the yards, and the time they spend in the yards.

- Treating ringworm-affected cattle each time they go through the yards, using an imidazole spray to minimise disease progression and the number of ringworm spores produced.
- Disinfecting the forcing yards, race and cattle crush with a sporicidal disinfectant prior to quarantine receipt, and again each time before cattle are handled through the yards.

Signposts

- [Veterinary Handbook for Cattle, Sheep and Goats – Ringworm](#)
- [Ringworm in Live Export Dairy Cattle – LIVE.0113 final report](#)

Warts

Warts can occur in all species and are caused by a species-specific papillomavirus. They are more common in younger animals and are spread by close contact. The virus enters the body through small abrasions in the skin.

Generally, warts have little to no health impact on livestock, but their appearance can devalue the animal and result in rejections by importing countries. Warts will reduce the value of cattle hides and they can bleed if knocked which may attract flies and may result in secondary infection.

If a mob arrives at a pre-export facility with warts on a number of animals the whole consignment may be rejected and not allowed to enter the facility.

It would be beneficial for a pre-export facility to develop a clear policy on rejection of cattle for warts or ringworm. Exporters and agents can then be made aware of this policy.

Signposts

- [Veterinary Handbook for Cattle, Sheep and Goats – Warts](#)

Scabby mouth

Scabby mouth (orf) is a viral infection affecting sheep, goats and sometimes humans. It is highly contagious and animals become infected when the virus enters the body via a break in the skin. Animals fed on hay or rough feed such as pellets are more likely to sustain minor mouth injuries that allow infection to become established. Infection rates can be high in young animals or in mobs that have not previously been exposed.

When animals are in close contact the infection can spread very rapidly. The severity of the clinical signs varies but severe lesions around the mouth can affect the animal's ability to eat and severe lesions on the feet can result in significant lameness.

Once an animal has been infected it develops lifelong immunity. There is also a vaccine available for scabby mouth. Consultation between the exporter and the facility veterinarian should occur before scabby mouth vaccine is applied as there are some importing country protocols for scabby mouth vaccine. As it is a zoonotic disease, care should be taken in handling animal with scabby mouth lesions.

Signposts

- [Veterinary Handbook for Cattle, Sheep and Goats – Scabby Mouth](#)

g. Lameness

If there are multiple cases of lameness occurring at once or lameness associated with drooling or sores around the top of the claws, immediate veterinary attention should be sought. However, the majority of lameness problems are not caused by a contagious condition and therefore require an individual case approach rather than a whole-herd or -flock response. A large number of lameness cases may indicate disease, an inappropriate pen surface, a diet that has been poorly introduced or an excessively high energy diet.

Cases of lameness may require treatment after investigation of the severity and nature of the problem. Prompt treatment is essential to ensure the welfare of the animal is not compromised.

Signposts

- [Veterinary Handbook for Cattle, Sheep and Goats – Lameness](#)

h. One-off problems

Disorders in individual animals, such as bruising, abscesses, cuts and abrasions will be observed from time to time. These will require assessment and treatment as necessary.

Signposts

- [Veterinary Handbook for Cattle, Sheep and Goats](#)

For the plan: Identify the important diseases

In conjunction with an experienced vet, identify the diseases or other animal health and welfare issues (such as heat stress) that are most likely to affect stock held on the premises. Considerations will include the types of shipments handled (e.g. species, age, sex, length of stay and so on), the environment (e.g. tropical, temperate) and the animal health history of the premises. Appendix 1 provides a template animal health plan, including examples of how the important animal health issues may be identified and described.

2. Management of animal risk factors

General

The process of placing animals into pre-export quarantine premises creates a number of risk factors for animal health, including:

- The need to transport animals (sometimes over considerable distance) to the premises
- The mixing of animals from various sources
- High stocking rates
- Changes in diet

Management of these risks should be carefully planned and carried out so the animal health and welfare impacts on the animals are minimised. These include:

- Handle stock carefully to minimise muscle damage, bruising, cuts, abrasions
- Avoid any management procedures that result in a break in the skin
- Ensure feed is not contaminated with carcasses or rodents, birds or reptiles

- Avoid mixing stock from various different consignments.
- Avoid stress:
 - Ensure there is an adequate clean water supply with sufficient access for all stock
 - Provide shelter or adopt other strategies to avoid heat or cold stress
 - Keep livestock handling to a minimum, and use low-stress handling techniques
 - Use stock facilities that enable ease of stock movement to avoid stress and lengthy slow mustering
 - Provide protection from extreme weather events
 - Avoid excessive or unnecessary loud, alarming noises
 - Minimise the use of dogs for stock movements and ensure dogs are not housed close to the livestock
 - Ensure transport time to the facility is kept to a minimum
- Have a quarantine area for animals that appear unwell on arrival or have had an extended transport time, or for some other reason are considered at increased risk of disease.
- Implement manure management systems.
- Develop procedures to ensure that there is adequate cleaning of stock handling facilities, water and feed troughs, and any other common washable surface within the facility.
- Employ experienced stock people who are familiar with the indicators of stock ill health.
- Have policies and procedures in place for rapid disease investigation and implementation of control strategies.

For the plan: Identify management practices to reduce health risks associated with the animals held at the premises

List the animal-specific factors that may increase the risk of animal health and welfare problems for the livestock. Then, identify those factors that can be readily modified to reduce the risk and those procedures that can be implemented to reduce the impact of those risk factors. Appendix 1 provides a template animal health plan, including an example of how the important animal-specific health issues may be identified and described.

Signposts

- [Animal handling \(to reduce stress\) – MLA](#)

Vaccination

Vaccination is a specific animal risk management strategy.

Numerous vaccines are used to protect livestock from disease. Vaccinations are commonly required to be given as one or more initial doses followed up with boosters in the future. Vaccines are not immediately effective at protecting animals and will never protect 100% of animals in a mob/herd, but in most cases they provide a highly cost-effective and low-risk means of disease prevention.

The exporter will specify what vaccinations are required to meet importing country protocols. The pre-export premises might also, on the advice of their vet, decide to vaccinate animals against certain diseases that present a particular risk to the animals whilst they are in quarantine. For most vaccines, though, 10-14 days is required to generate effective immunity. Vaccines will therefore be of limited value to animals held on a premises for a short period.

If any vaccines additional to those required by export protocols are to be administered, it is critical that any relevant withholding periods are observed.

Signposts

- [Vaccines – MLA](#)

3. Management of the facility risk factors

Aspects of the facilities influence the animal health risk. These include:

- Location
- Quality of stock-handling facilities, including floors
- Stock-handling procedures
- Skill of stock persons
- Standard of hygiene
- Pen selection (based on risk)
- Extent and quality of surveillance, reporting and recording, staff training and procedures for disease investigation and control.

In setting up a pre-export premises from the beginning, these factors can be considered and best principles of design and construction of the facility applied. Time taken to consider and develop optimum biosecurity and animal health management measures for the facility will provide a good basis for animal health management.

Facilities require constant maintenance and upgrading to keep them in good order and ensure they do not negatively impact on the animal health of the livestock.

Signposts

- Further details on ways to minimise the facility risks to animal health can be found in the Pre-Export Premises Reference Manual

For the plan: Develop a plan to manage the animal health risks associated with the facilities
List the facility-specific factors that may increase the risk of animal health and welfare issues for the livestock. Then, develop a management plan to minimise the number of risk factors as well as developing procedures to reduce the impact of those risk factors at the facility. A standard operating procedure (SOP) that outlines the precise procedure for cleaning the facility between consignments should be developed in consultation with the facility veterinarian, the exporter and facility management. Appendix 1 provides a template animal health plan, including an example of how the important facility-specific health issues may be identified and described.

4. Conducting surveillance for disease

The Australian Standards of Export of Livestock (Version 3.0) 2020 sets minimum standards in respect to monitoring of animal health.

*3.1.15 Livestock must be individually inspected at unloading, and inspected at least daily, to determine whether they are suitable for preparation for export. Any livestock identified as being distressed, injured or otherwise unsuitable for export (including the rejection criteria outlined in Standard 1 **Error! Reference source not found.**) must be rejected from the consignment, marked by a semi-permanent or permanent method and isolated from the rest of the consignment. Any other condition that could be defined as an infectious or contagious disease, or would mean that the animal's health or welfare could decline or that the animal would suffer distress during transport, also requires the animal's rejection from export preparation. For any animals found unsuitable, arrangements must be made for their prompt and humane handling, treatment and care, including:*

- a) provision of treatment to all sick or injured livestock; and*
- b) provision of veterinary advice if the cause of a sickness or injury is not obvious, or if action taken to prevent or treat the problem is ineffective; and*
- c) where required euthanasia and/or disposal, in compliance with all relevant and applicable legislation.*

3.1.20 Daily monitoring of livestock health, welfare and mortality must include:

- d) inspection of all livestock by a competent stock handler; and*
- e) rejection of any livestock and their management as per Standard 0; and*
- f) investigation by a registered veterinarian if mortalities in any 1 paddock or shed exceed 0.1% or 3 deaths, whichever is the greater, on any 1 day for cattle and buffalo, or 0.25% or 3 deaths, whichever is greater, on any 1 day for any other species of livestock; and*
- g) removal of dead livestock on a daily basis. Carcasses must be disposed of in compliance with all relevant and applicable legislation.*

Surveillance as part of animal health management at a pre-export premises will include surveillance of both animals and the environment. The environment includes all those things in the animal's surrounds that could impact on its health and welfare.

Animals

Regular, routine observation of livestock by an experienced stock person is vital to allow early identification of disease. Employing suitably-experienced staff and/or training them in the appropriate skills to identify unusual behaviours, signs of stress and clinical signs of the common diseases are essential. Early detection is a key component to disease management, especially in an intensive stocking environment, where ease of disease spread is a critical risk.

Training of stock handlers is essential to achieving good animal health and welfare outcomes for stock. Handlers need to understand what is normal behaviour for livestock before unusual behaviours can be easily identified. There are also significant differences between the different livestock species in what constitutes 'normal' and 'abnormal' behaviours.

There are numerous online training resources available on the various species but practical experience is by far the most valuable teacher.

The frequency of inspection (which should be at least daily) might vary depending on:

- Veterinary advice
- How recently the stock arrived at the premises
- Length of travel by stock to the premises
- Age of the stock
- Duration of stay at the premises
- Recent disease event history at the premises
- Any recent stress events including:
 - Decrease in water quality
 - Water supply interruption
 - Feed disruption
 - Sudden feed change
 - Inadvertent over-feeding
 - Severe weather event
 - Sudden change in weather
 - Recent introductions
 - Recent handling.

The method of surveillance will be determined to maximise efficiency but minimise the negative impacts on the animals. This will also be influenced by:

- Stocking intensity
- Size of the pens
- Type of livestock
- Human health and safety considerations.

For the plan: Develop a standard operating procedure for animal surveillance

The premises should develop a standard operating procedure (SOP) for animal surveillance. This procedure should consider the method(s) of surveillance (over the fence, on horseback etc) and the frequency of surveillance – at least daily, as this is an ASEL requirement. It should also specify what records are to be made following each inspection. Appendix 2 provides a template for a standard operating procedure.

Environment

Surveillance of the environment will take into account:

- Weather forecasts
- The condition of the facilities, especially fencing and yards
- Ground and pen floor conditions (muddy/dusty)
- Recent introduction of new animals
- Feral or wild animal activity
- Water quality
- Feed quality.

For the plan: Develop a standard operating procedure for environmental surveillance

The premises should develop an SOP for environmental surveillance. This procedure will include the frequency of surveillance for the environmental factors that the premises has identified as relevant. Action triggers for response and reporting should also be determined and recording expectations outlined. The action response will be based on the severity of the problem, the significance of the possible impact on the animals' health and welfare and the ease or difficulty of rectifying the problem. Appendix 2 provides a template for a standard operating procedure.

A pre-export premises should have procedures in place to respond to the major and most likely extreme weather conditions to which the facility is exposed. It might be that weather is monitored twice daily. A forecast of 'extreme heat' or a 'severe weather alert' may be identified as the trigger for the senior stock manager to decide whether to implement contingency measures.

A specific environmental event for which all premises in Australia should be prepared is extreme heat. The susceptibility of the animals to heat will depend on:

- The suddenness of the change of temperature (any rapid increase or decrease in temperature can have a significant impact on the health and welfare of livestock).
- The breed of animals (for example, *Bos indicus* cattle are more heat tolerant).
- The health of the animals, those that are unwell being less able to cope with the heat.
- The colour of the animals, dark-coloured animals absorbing more heat and therefore tending to be more impacted by heat.
- Body condition, animals that are fat tending to be more affected by the heat.

Signposts

- [Heat stress – MLA](#)

For the plan: Develop a standard operating procedure for extreme weather events

The premises should develop a standard operating procedure (SOP) to deal with extreme weather events such as extreme heat or cold snaps. The plan should identify trigger points for the activation of the plan. Appendix 2 provides a template for a standard operating procedure.

5. Investigation of health or welfare problems

The Australian Standards of Export of Livestock (Version 3.0) 2020 provides minimum standards in respect to monitoring animal health and triggers for further investigation of disease.

3.1.20 Daily monitoring of livestock health, welfare and mortality must include:

- h) inspection of all livestock by a competent stock handler; and*
- i) rejection of any livestock and their management as per Standard 0; and*

- j) investigation by a registered veterinarian if mortalities in any 1 paddock or shed exceed 0.1% or 3 deaths, whichever is the greater, on any 1 day for cattle and buffalo, or 0.25% or 3 deaths, whichever is greater, on any 1 day for any other species of livestock; and*
- k) removal of dead livestock on a daily basis. Carcasses must be disposed of in compliance with all relevant and applicable legislation.*

Indicators of disease

Indicators that livestock may be affected by disease include:

- a. Deaths
- b. Animal/s showing signs that they may be unwell
- c. Poorer than expected productivity (although this may not be measurable within the short stay of animals at a pre-export premises).

a. Deaths

Animals may die as a single isolated incident due to (for example) an accident, gastrointestinal catastrophe or inherited disorder (such as a heart condition). Premises must observe the ASEL requirements for veterinary investigation in cases where a number of deaths occur, exceeding the specified thresholds.

'Sudden death' is generally defined as death that occurs without any premonitory signs (that is, no clinical signs of disease were evident at the last inspection).

Sudden death can be caused by:

- Accident, injury or trauma
- Infections (e.g. bacteria, viruses)
- Parasites
- Feed-related / metabolic disorders (e.g. acidosis, bloat)
- Toxicity.

In the investigation of sudden death collecting a history is essential and will often provide the best lead as to cause of death. Important elements of the history will include:

- Number of animals dead
- Time since arrival at the facility
- Length of travel time to the facility
- Mixing of lots
- Change of diet procedure
- Weather conditions
- Husbandry procedures
- Additional stressful events (e.g. stray dog / fox)
- Changes in feed supply
- Change of water supply
- Vaccination history.

An uncommon cause of sudden death in livestock is anthrax. It is caused by a bacterium that can also affect humans (i.e., it is zoonotic). If there is any suspicion that an animal has died from anthrax the carcass should not be opened or moved. The local state or territory government animal health staff should be contacted to perform testing on the carcass to rule out anthrax as a cause of death. There are simple diagnostic tests that can be

performed to diagnose anthrax and these must be performed to rule out anthrax before a post-mortem is performed.

In cases where anthrax is the cause of death, the carcass typically 'blows up' rapidly after death and begins to break down quickly. Sometimes there is a dark red-black discharge from orifices. There may be more than one animal die initially, and generally the number of animals that die daily increases in the following period.

In cases where trauma is the cause of death, there will usually be just one animal affected and injuries may be seen externally. The history may also increase suspicion of death by trauma (e.g. storms / lightning strikes).

Clostridial diseases can be an important cause of sudden death, despite the availability of vaccines. A full course of vaccine may not have been administered. In some cases, for example with pulpy kidney, the clostridial challenge may be so acute that vaccination does not prevent death. A post-mortem performed (after the exclusion of anthrax) may show lesions that are suggestive of a clostridial disease and this may be confirmed by laboratory testing. Other infectious causes of death can also be diagnosed by post-mortem and further laboratory testing.

A history of change of paddock or diet can be suggestive of a diet related death or poisoning. Collecting a proper history is essential in determining the cause of sudden death.

Signposts

- [Veterinary Handbook for Cattle, Sheep and Goats – Sudden Death](#)

b. Animal/s showing signs that they may be unwell

These signs include:

- Altered eating or drinking patterns
- Changes in faecal consistency
- Isolation from the main group
- Increased time spent lying down
- Hanging of the head
- Reduced responsiveness
- Increased breathing rate or effort
- Reluctance to move
- Drooling
- Coughing
- Mucus from the nose
- Swellings
- Restlessness
- Kicking at the belly
- Bloating
- Lethargy.

These signs can be seen with non-invasive observation.

c. Poorer than expected productivity

Reduced productivity would normally refer to reduced growth rate, poor milk production or low conception or birth rates. Animals that have been recently introduced to a pre-export premises might be expected to exhibit slowed weight gain anyway due to stress and change

in diet, so any such reduction in productivity at a pre-export premises should be interpreted cautiously.

Triggers for investigation

At some point, one or more of these indicators of disease should trigger a more detailed investigation. These trigger points should be determined by considering:

- Best animal health and welfare outcomes for the animals
- Advice from a veterinarian
- ASEL standards
- Facility operations (animal turnaround time, premises vacancy times)
- Importing country requirements
- The season
- The facility's disease history.

These triggers (for example, a certain number of animals scouring) should be captured as part of the animal health plan and be linked to the disease investigation SOPs (see below).

Investigation of disease

Several approaches are used to investigate a disease event. A disease investigation should be conducted by, or in consultation with, a suitably qualified veterinarian. One or more SOP(s) should be developed to guide those investigations in which staff will play a role (see below).

The process of investigation may include:

Collecting a history

Important aspects of the history will include:

- When the affected animal(s) arrived at the premises
- From where, and how far, the animal(s) were transported to the premises
- The animal health history of the source farm
- Whether the animal(s) has been provided with any treatments/medications since arriving
- What feed and water the animal(s) has been provided
- What the weather conditions have been
- How many other animals in the cohort are affected, and if so, where these animals are located in the premises (for example, in the same pen only)
- The findings from previous investigation of affected animals.

Clinical examination

A thorough clinical examination will provide more detailed information about the disease process. Affected animal(s) will need to be removed from the pen for a more detailed examination in an appropriate restraining facility. Clinical examination of livestock should only be conducted by someone suitably trained to do so and all appropriate measures must be taken to minimise the risk of physical injury from livestock.

A veterinarian will be required to interpret the information obtained from a clinical examination, to recommend any further diagnostic testing and to prescribe treatment.

Post-mortem examination

Post-mortem examinations (necropsies) should not be carried out without consultation with a veterinarian, both to maximise the chances of finding important clues to the disease, and to ensure that any human health risks (from zoonotic diseases) are taken into account.

A necropsy can provide vital information in a disease investigation as long as it is performed by someone adequately trained to do so and soon after death before the tissues have broken down. Samples collected at necropsy can be further examined by a laboratory which will provide further diagnostic information and a guide to the appropriate treatment.

Reporting and recording

Certain diseases are 'notifiable'. That is, suspicion of their presence must be notified to the relevant state or territory authority. All staff working with stock should be aware of this obligation. The Emergency Animal Disease Watch Hotline can also be called at any time on 1800 675 888 if there is suspicion of an emergency disease such as foot-and-mouth disease.

Normally, however, the premises veterinarian will decide whether notification of the authorities is required.

All disease events and deaths should be accurately recorded. In the event that a significant outbreak eventuates the initial case details could prove crucial in the disease investigation.

The use of medications must also be recorded as per the relevant legislation (see the Reference Manual for Pre-Export Quarantine Premises). It is likely that any animal that has been significantly unwell and has required treatment will no longer be suitable for export. Also, most medications carry a meat Withholding Period (WHP) and an Export Slaughter Interval (ESI) which must be observed. Current details of the requirements for importing countries in respect to medications must be available to the exporting company at all times.

For the plan: Develop trigger points and standard operating procedures for disease investigation

The premises should develop agreed triggers and SOP(s) for investigating disease events. An important role of the SOP(s) will be to protect human health and safety from risks posed by animal handling, zoonotic disease and using sharp instruments such as needles and knives. Appendix 2 provides a template for a standard operating procedure.

Signposts

- [Veterinary Handbook for Cattle, Sheep and Goats – Detecting Sick Animals](#)
- [Veterinary Handbook for Cattle, Sheep and Goats – Investigating a Disease Event](#)

6. Disease response and control

For routine diseases the premises veterinarian will advise on what procedure is required to respond to the disease event as well as the strategies to control the disease spread. SOPs can be prepared in consultation with the veterinarian to specify how common diseases will be dealt with by staff. The SOP should include:

- The requirement or otherwise to isolate the animal
- Medication to be given

- Dose rate of medication
- Treatment administration technique and position
- Withholding period and export slaughter interval considerations
- Recording of treatment
- Recording of disease event
- Possible complications
- Expected recovery times
- Signs of improvement
- Triggers to escalate veterinary involvement.

The LiveCorp / MLA [Veterinary Handbook for Cattle, Sheep and Goats](#) provides a very comprehensive guide to the diseases most likely to affect livestock that are being exported. Diseases can be searched by name or according to the clinical signs. **The use of this handbook should not replace the use of a qualified veterinarian, however.**

In the event of an emergency animal disease such as anthrax or foot-and-mouth disease the response would be managed by the relevant authority. The premises would be advised of what is required in terms of culling affected animals, quarantine, disinfection and so on. See the emergency animal disease response plan in the Biosecurity Manual.

For the plan: Develop standard operating procedures for treating common diseases
 In consultation with the veterinarian the facility should develop SOPs for responding to the diseases commonly diagnosed at the premises. These procedures will not replace consultation with the veterinarian but provide a clear procedure for staff to follow. Appendix 2 provides a template for a standard operating procedure.

7. Reporting and recording

Recording is a vital part of animal health management. Every introduction of animals, change of feed, new feed supply, interruption to water, rain event, excessive heat event, disease case, death, and human intervention should be recorded. This information could be vital in the event of a significant disease event, both for its resolution and the avoidance of future outbreaks.

All livestock disease cases and deaths must be recorded. Records should include the pen number, ear tag number, clinical signs, and number of stock affected. In addition, any medication, vaccine or chemical given to an animal must be recorded and those records maintained for a minimum of five years. This is a legal requirement in all states and territories. The information to be recorded includes:

- Date of administration
- Product trade name
- The batch number
- The expiry date
- Withholding period / export slaughter interval
- Location of administration
- Dose rate
- Stock treated (this would include the pen number in a pre-export premises)
- The number of stock treated
- Who administered the vaccine.

Signposts

- [Livestock Production Assurance livestock treatment record template – MLA](#)

For the plan: Develop a standard operating procedure and templates for reporting and recording

The reporting and recording requirements for the premises in relation to animal health should be defined in an SOP and must meet ASEL recording requirements. This SOP should specify what information should be recorded, where the information should be recorded and how soon after the event information must be recorded. Appendix 2 provides a template for a standard operating procedure.

Appendix 1: Animal health plan template

1. Key animal health issues

- The key animal health issues should be identified in discussion with the premises veterinarian, and possibly also a local state/territory government vet or animal health officer
- If there is significant seasonal variation in disease incidence, consider completing a 'Key animal health issues table' for the different seasons
- Some of the commonly occurring diseases are described below, but these are not comprehensive lists – replace or supplement these with the most important local health issues

Cattle

Disease	Priority (H,M,L)	Key clinical signs	Predisposing factors (season, stock age, weather)	Triggers for veterinary intervention	Key documents
Diet-related conditions					
Acidosis	To be agreed with vet	<ul style="list-style-type: none"> • Diarrhoea • Inappetence • Depression • Dehydration • Low temperature • Colic 	<ul style="list-style-type: none"> • Reduced roughage access • Sudden introduction of pellets • Large, strong animals 	To be agreed with vet	Handbook – Acidosis SOP: Diet introduction
Shy feeders		<ul style="list-style-type: none"> • Lack of appetite • Weight loss 	<ul style="list-style-type: none"> • Rapid change in diet • Other stresses 		Handbook – Shy feeders
Contaminated feed		<ul style="list-style-type: none"> • Varies with contamination 	<ul style="list-style-type: none"> • Feeding on the ground • Urine and faecal contamination of feeding troughs 		SOP: Feeding out to avoid contamination
Nutritional deficiencies		<ul style="list-style-type: none"> • Varies with deficiency 	<ul style="list-style-type: none"> • Poor diet preparation 		
Poisonings		<ul style="list-style-type: none"> • Varies with type of poisoning 	<ul style="list-style-type: none"> • Poor feed preparation / contamination • Excessive nutritional supplementation 		
Respiratory diseases					
Bovine respiratory disease		<ul style="list-style-type: none"> • Nasal, ocular, oral discharge • Depression • Lethargy • Shallow laboured breathing • Coughing • Extended head and neck 	<ul style="list-style-type: none"> • Cattle in feed lots • In first few weeks after entrance to feedlot • Mixing cattle from various sources 		Handbook – BRD SOP: BRD

Disease	Priority (H,M,L)	Key clinical signs	Predisposing factors (season, stock age, weather)	Triggers for veterinary intervention	Key documents
Gastrointestinal diseases					
Salmonellosis ZOONOTIC		<ul style="list-style-type: none"> • High temperature • Diarrhoea with or without blood and mucus • Pregnant females may abort • Dullness • Sunken eyes • Kick at belly grind teeth • death 	<ul style="list-style-type: none"> • Stress • Immunocompromised (very young or very old, pregnant animals) • Long haul transport • Sudden deprivation of food or water • Crowding • Mixing of unfamiliar stock • Concurrent illness/ injury • Severe weather events or sudden change of weather. 		Handbook - Salmonellosis SOP: Salmonella response
Coccidiosis		<ul style="list-style-type: none"> • Diarrhoea (yellow-brown to black, possible fresh blood) • Loss of appetite • Dehydration • Weight loss • Straining 	<ul style="list-style-type: none"> • Mostly very young or very old animals • Stressed animals • Intensively housed animals • Conjunction with other conditions • Feed or water on the ground • Wet pastures • Concurrent diseases 		Handbook – Coccidiosis
Parasite infestations					
Worms		<ul style="list-style-type: none"> • Scouring • Weight loss • Death 	<ul style="list-style-type: none"> • Younger animals 		Handbook – Gastrointestinal Parasitism SOP: Worm management
Ticks (tick fever)		<ul style="list-style-type: none"> • Rapid condition loss • Dark urine • fever 	<ul style="list-style-type: none"> • Cattle from non-tick areas introduced to tick areas for preparation for export 		Handbook – Tick Fever
Eye conditions					
Pinkeye		<ul style="list-style-type: none"> • Bloodshot eye • Watery eye • White scar on eye • Blindness 	<ul style="list-style-type: none"> • Dusty conditions • High fly numbers • High density housing • Feeds that create an aerosol. 		Handbook – Pinkeye SOP: Pinkeye
Skin conditions					

Disease	Priority (H,M,L)	Key clinical signs	Predisposing factors (season, stock age, weather)	Triggers for veterinary intervention	Key documents
Ringworm ZONOTIC	<ul style="list-style-type: none"> Reduced saleability Possible rejection 	<ul style="list-style-type: none"> Circular hairless skin lesions 	<ul style="list-style-type: none"> Mostly affecting younger animals Hot and humid weather High density housing 		Handbook – Ringworm SOP: Ringworm
Warts	<ul style="list-style-type: none"> May cause exclusion from export Reduced hide value 	<ul style="list-style-type: none"> Hairless growths on skin or mucosa Mostly on head, neck and shoulder 	<ul style="list-style-type: none"> Young animals less than two years 		Handbook – Warts
Lameness					
		<ul style="list-style-type: none"> Reluctance to move Prolonged recumbency 	<ul style="list-style-type: none"> Rough handling Unmatched pen mates on size and sex Rough abrasive floor surfaces 		Handbook – Lameness
One-off problems					
Heat stress		<ul style="list-style-type: none"> Increased water consumption Sweating Increased respiratory rate 	<ul style="list-style-type: none"> Limited shade Sudden climate change Insufficient time to adapt 		Handbook – Heat stress
		<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 		
Other					

Sheep

Disease	Priority (high {H}, medium {M}, low {L})	Key clinical signs	Predisposing factors (season, stock age, weather)	Triggers for veterinary intervention	Key documents
Diet-related conditions					
Acidosis	To be agreed with vet	<ul style="list-style-type: none"> • Diarrhoea • Inappetence • Depression • Dehydration • Low temperature • Colic 	<ul style="list-style-type: none"> • Reduced roughage access • Sudden introduction of pellets • Large, strong animals 	To be agreed with vet	Handbook – Acidosis
Inanition		<ul style="list-style-type: none"> • Lack of appetite • Weight loss 	<ul style="list-style-type: none"> • Adult fat sheep, coming from high plane of nutrition • Stress 		Handbook – Inappetence / Inanition
Contaminated feed		<ul style="list-style-type: none"> • Varies with contamination 	<ul style="list-style-type: none"> • Feeding on the ground • Urine and faecal contamination of feeding troughs 		
Nutritional deficiencies		<ul style="list-style-type: none"> • Varies with deficiency 	<ul style="list-style-type: none"> • Poor diet preparation 		
Poisonings		<ul style="list-style-type: none"> • Varies with type of poisoning 	<ul style="list-style-type: none"> • Poor feed preparation / contamination • Excessive nutritional supplementation 		
Respiratory diseases					
Pneumonia/respiratory distress		<ul style="list-style-type: none"> • Difficulty breathing • Coughing • Extended head and neck • Saw horse posture 	<ul style="list-style-type: none"> • Stress • Heat stress 		Handbook – Pneumonia Handbook – Respiratory Distress

Disease	Priority (high {H}, medium {M}, low {L})	Key clinical signs	Predisposing factors (season, stock age, weather)	Triggers for veterinary intervention	Key documents
Gastrointestinal diseases					
Salmonellosis ZOONOTIC		<ul style="list-style-type: none"> • High temperature • Diarrhoea with or without blood and mucus • Pregnant females may abort • Dullness • Sunken eyes • Kick at belly grind teeth • Death 	<ul style="list-style-type: none"> • Inanition • Mixing of animals • Frequent or prolonged transport • Time off feed • Concurrent disease • Inclement weather 		Handbook – Salmonellosis SOP: Salmonella response
Coccidiosis		<ul style="list-style-type: none"> • Diarrhoea (yellow-brown to black, possible fresh blood) • Loss of appetite • Dehydration • Weight loss • Straining 	<ul style="list-style-type: none"> • Mostly affecting very young animals or very old animals • Stressed animals • Intensively housed animals • Conjunction with other conditions • Feed or water on the ground • Wet pastures • Concurrent diseases 		Handbook – Coccidiosis
Parasite infestations					
Worms		<ul style="list-style-type: none"> • Loss of condition • Reduced growth rates • Lack of appetite • Diarrhoea • Weakness • Death 	<ul style="list-style-type: none"> • Young animals • Winter rainfall raised animals 		Handbook – Gastrointestinal Parasitism SOP: Worm management
Lice		<ul style="list-style-type: none"> • Scratching • Deranged wool 	<ul style="list-style-type: none"> • Long fleece 		Handbook – Lice

Disease	Priority (high {H}, medium {M}, low {L})	Key clinical signs	Predisposing factors (season, stock age, weather)	Triggers for veterinary intervention	Key documents
Eye conditions					
Pinkeye		<ul style="list-style-type: none"> Bloodshot eye Watery eye White scar on eye Blindness 	<ul style="list-style-type: none"> Dusty conditions High fly numbers High density housing Feeds that create an aerosol 		Handbook – Pinkeye SOP: Pinkeye
Skin conditions					
Ringworm ZOONOTIC	<ul style="list-style-type: none"> Reduced saleability Possible rejection 	<ul style="list-style-type: none"> Circular hairless skin lesions 	<ul style="list-style-type: none"> Younger animals Hot and humid weather High density housing 		Handbook – Ringworm
Scabby mouth ZOONOTIC	<ul style="list-style-type: none"> Can result in rejection of consignment 	<ul style="list-style-type: none"> Red areas and brown scabs around lips, nostrils and sometimes ears and feet Swelling of lips 	<ul style="list-style-type: none"> Especially in summer and Autumn Feeding on abrasive feeds (stubbles seeds and burrs) High fly numbers and activity Heavily contaminated environment Unvaccinated animals 		Handbook – Scabby Mouth
Lameness					
		<ul style="list-style-type: none"> Reluctance to move Increased recumbency 	<ul style="list-style-type: none"> Poor floor designs Grain overload (laminitis) Over crowding Mixing of groups 		Handbook – Lameness

Disease	Priority (high {H}, medium {M}, low {L})	Key clinical signs	Predisposing factors (season, stock age, weather)	Triggers for veterinary intervention	Key documents
One-off problems					
Heat stress		<ul style="list-style-type: none"> • Reduced feed intake • Depression • Rapid breathing (and heart rate) • Panting • Dehydration 	<ul style="list-style-type: none"> • Hot weather • Sudden change in weather • Little shade • Reduced ventilation • High stocking rates • Failure to adapt • Dark coat colour • High humidity 		Handbook – Heat Stress
Other					

Goats

Disease	Priority (high {H}, medium {M}, low {L})	Key clinical signs	Predisposing factors (season, stock age, weather)	Triggers for veterinary intervention	Key documents
Diet-related conditions					
Acidosis	To be agreed with vet	<ul style="list-style-type: none"> • Diarrhoea • Inappetence • Depression • Dehydration • Low temperature • Colic 	<ul style="list-style-type: none"> • Reduced roughage access • Sudden introduction of pellets • Large, strong animals 	To be agreed with vet	Handbook – Acidosis
Inanition		<ul style="list-style-type: none"> • Lack of appetite • Weight loss 	<ul style="list-style-type: none"> • Feral goats are a higher risk 		Handbook – Inappetence / Inanition
Contaminated feed		<ul style="list-style-type: none"> • Varies with contamination 	<ul style="list-style-type: none"> • Feeding on the ground • Urine and faecal contamination of feeding troughs 		
Nutritional deficiencies		<ul style="list-style-type: none"> • Varies with deficiency 	<ul style="list-style-type: none"> • Poor diet preparation 		
Poisonings		<ul style="list-style-type: none"> • Varies with type of poisoning 	<ul style="list-style-type: none"> • Poor feed preparation contamination • Excessive nutritional supplementation 		
Respiratory diseases					
Pneumonia/respiratory distress		<ul style="list-style-type: none"> • Difficulty breathing • Coughing • Extended head and neck • Saw horse posture 	<ul style="list-style-type: none"> • Stress • Heat stress 		Handbook – Pneumonia Handbook – Respiratory Distress

Disease	Priority (high {H}, medium {M}, low {L})	Key clinical signs	Predisposing factors (season, stock age, weather)	Triggers for veterinary intervention	Key documents
Gastrointestinal diseases					
Salmonellosis ZOONOTIC		<ul style="list-style-type: none"> • High temperature • Diarrhoea with or without blood and mucus • Pregnant females may abort • Dullness • Sunken eyes • Kick at belly grind teeth • Death 	<ul style="list-style-type: none"> • Inanition • Mixing of animals • Frequent or prolonged transport • Time off feed • Concurrent disease • Inclement weather • Other stress 		Handbook – Salmonellosis SOP: Salmonella response
Coccidiosis		<ul style="list-style-type: none"> • Diarrhoea (yellow-brown to black, possible fresh blood) • Loss of appetite • Dehydration • Weight loss • Straining 	<ul style="list-style-type: none"> • Very young or very old animals • Stressed animals • Intensively housed animals • Conjunction with other conditions • Feed or water on the ground • Wet pastures • Concurrent diseases 		Handbook – Coccidiosis
Parasite infestations					
Worms		<ul style="list-style-type: none"> • Loss of condition • Reduced growth rates • Lack of appetite • Diarrhoea • Weakness • Death 	<ul style="list-style-type: none"> • Goats particularly susceptible 		Handbook – Gastrointestinal Parasitism SOP: Worm management
Lice		<ul style="list-style-type: none"> • Scratching and biting 	<ul style="list-style-type: none"> • Explosive increase in numbers in stressed animals 		Handbook – Lice

Disease	Priority (high {H}, medium {M}, low {L})	Key clinical signs	Predisposing factors (season, stock age, weather)	Triggers for veterinary intervention	Key documents
Eye conditions					
Pinkeye		<ul style="list-style-type: none"> Bloodshot eye Watery eye White scar on eye Blindness 	<ul style="list-style-type: none"> Dusty conditions High fly numbers High density housing Feeds that create an aerosol 		Handbook – Pinkeye SOP: Pinkeye
Skin conditions					
Ringworm ZOONOTIC	<ul style="list-style-type: none"> Reduced saleability Possible rejection 	<ul style="list-style-type: none"> Circular hairless skin lesions 	<ul style="list-style-type: none"> Rarer in goats Mostly affecting younger animals Hot and humid weather High density housing 		Handbook – Ringworm
Scabby mouth ZOONOTIC	<ul style="list-style-type: none"> Can result in rejection of consignment 	<ul style="list-style-type: none"> Red areas and brown scabs around lips, nostrils and sometimes ears and feet Swelling of lips 	<ul style="list-style-type: none"> Especially in summer and autumn Feeding on abrasive feeds (stubbles seeds and burrs) High fly numbers and activity Heavily contaminated environment Unvaccinated animals 		Handbook – Scabby Mouth
Lameness					
		<ul style="list-style-type: none"> Reluctance to move Increased recumbency 	<ul style="list-style-type: none"> Poor floor designs Grain overload (laminitis) Over crowding Mixing of groups 		Handbook – Lameness

Disease	Priority (high {H}, medium {M}, low {L})	Key clinical signs	Predisposing factors (season, stock age, weather)	Triggers for veterinary intervention	Key documents
One-off problems					
Heat stress		<ul style="list-style-type: none"> • Reduced feed intake • Depression • Rapid breathing (and heart rate) • Panting • Dehydration 	<ul style="list-style-type: none"> • Hot weather • Sudden change in weather • Little shade • Reduced ventilation • High stocking rates • Failure to adapt • Dark coat colour • High humidity 		Handbook – Heat Stress
Other					

2. Animal risk factor management

- In discussion with the premises veterinarian, and possibly also a local state/territory government vet or animal health officer, list the animal-specific factors that may increase the risk of animal health and welfare problems for the livestock
- Some examples are given below, but they are just thought-starters
- Identify the steps that can be taken to reduce those risks

Risk [EXAMPLES ONLY]	Risk mitigation procedures [EXAMPLES ONLY]
Long haul transport to facility	<ul style="list-style-type: none"> • Quarantine animals on arrival • Introduce feed gradually to minimise gorging • Etc
Stock from xxx location(s) susceptible to xxx [condition]	<ul style="list-style-type: none"> • Vaccinate on arrival • Etc
Etc	

3. Facility risk factor management

- In discussion with the premises veterinarian, and possibly also a local state/territory government vet or animal health officer, list the facility-specific factors that may increase the risk of animal health and welfare problems for the livestock
- Some examples are given below, but they are just thought-starters
- Identify the steps that can be taken to reduce those risks

Risk [EXAMPLES ONLY]	Risk mitigation procedures [EXAMPLES ONLY]
Deaths due to cold snaps	<ul style="list-style-type: none"> • Review 7-day weather forecast every morning • Activate Cold Weather SOP when temperature is forecast to drop to xxx or wind chill to xxx
Infection or toxicosis due to contamination of feed and water troughs	<ul style="list-style-type: none"> • Inspect troughs twice per day and clean if required • Etc
Injury due to damaged handling facilities, yards and other structures	<ul style="list-style-type: none"> • Inspect handling facilities, yards and all other fittings weekly • Report all faults immediately and rectify before any animals come into contact • Etc
Pinkeye due to dust	<ul style="list-style-type: none"> • Etc
Etc	

Risk [EXAMPLES ONLY]	Risk mitigation procedures [EXAMPLES ONLY]

Appendix 2: Standard operating procedure template

Document details

- Name of the procedure/ process
- Name of author of procedure
- Name of reviewing author
- Date of completion of SOP
- Date for SOP renewal
- Purpose
- SOP number

Content

- Table of contents (for long SOPs)
- Workplace health and safety (WHS) considerations
- Animal health and welfare considerations
- Links to other relevant SOPs
- Detailed description of the process / procedure in simple, easy to understand steps
- Timeliness of completion of procedure
- Staff responsibilities
- Reporting and recording requirements
- References