

AUSTRALIAN VETERINARY EMERGENCY PLAN

AUSVETPLAN

Disease Strategy

Scrapie

Version 3.0, 2009

AUSVETPLAN is a series of technical response plans that describe the proposed Australian approach to an emergency animal disease incident. The documents provide guidance based on sound analysis, linking policy, strategies, implementation, coordination and emergency-management plans.

Primary Industries Ministerial Council

This disease strategy forms part of:

AUSVETPLAN Edition 3

This strategy will be reviewed regularly. Suggestions and recommendations for amendments should be forwarded to:

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DISEASE WATCH HOTLINE

1800 675 888

The Disease Watch Hotline is a toll-free telephone number that connects callers to the relevant state or territory officer to report concerns about any potential emergency disease situation. Anyone suspecting an emergency disease outbreak should use this number to get immediate advice and assistance.

Preface

This disease strategy for the control and eradication of scrapie is an integral part of the **Australian Veterinary Emergency Plan**, or **AUSVETPLAN (Edition 3)**. AUSVETPLAN structures and functions are described in the **AUSVETPLAN Summary Document**. The disease strategy provides information about the disease (chapter 1), the relevant risk factors and their treatment, and the options for the management of a disease outbreak depending on the circumstances (chapter 2) and the policy that will be adopted in the case of an outbreak (chapters 3 and 4).

This manual has been produced in accordance with the procedures described in the AUSVETPLAN Summary Document and in consultation with Australian national, state and territory governments and the sheep and goat industries.

Scrapie is included on the OIE (World Organisation for Animal Health) list of notifiable disease of sheep and goats. This obliges OIE member countries that had been free from the disease to notify the OIE within 24 hours of confirming the presence of scrapie. OIE-listed diseases are diseases with the potential for international spread, significant mortality or morbidity within the susceptible species and/or potential for zoonotic spread to humans.¹

The strategies in this document for the diagnosis and management of an outbreak of scrapie are based on the recommendations in the *OIE Terrestrial Animal Health Code*² and the *OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals*³.

In Australia, scrapie is included as a Category 3 emergency animal disease in the *Government and Livestock Industry Cost Sharing Deed In Respect of Emergency Animal Disease Responses (EAD Response Agreement)*.⁴

Text placed in square brackets [xxx] indicates that that aspect of the manual remains contentious or is under development; such text is not part of the official manual. The issues will be worked on by experts and relevant text included at a future date.

Detailed instructions for the field implementation of AUSVETPLAN are contained in the disease strategies, operational procedures manuals, management manuals and wild animal manual. Industry-specific information is given in the relevant enterprise manuals. The full list of AUSVETPLAN manuals that may need to be accessed in an emergency are shown below.

In addition, *Exotic Diseases of Animals: A Field Guide for Australian Veterinarians* by WA Geering, AJ Forman and MJ Nunn, Australian Government Publishing

¹ These criteria are described in more detail in Chapter 1.2 of the *OIE Terrestrial Animal Health Code* (http://www.oie.int/eng/normes/mcode/en_chapitre_1.1.2.htm).

² http://www.oie.int/eng/normes/mcode/en_chapitre_1.14.9.htm

³ http://www.oie.int/eng/normes/mmanual/2008/pdf/2.07.13_SCRAPIE.pdf

⁴ Information about the EAD Response Agreement can be found at <https://www.animalhealthaustralia.com.au/programs/eadp/eadra.cfm>

Service, Canberra, 1995 (to be updated) is a source for some of the information about the aetiology, diagnosis and epidemiology of the disease.

AUSVETPLAN manuals⁵

Disease strategies

- Individual strategies for each of 30 diseases
- Bee diseases and pests
- Response policy briefs (for diseases not covered by individual manuals)

Operational procedures manuals

- Decontamination
- Destruction of animals
- Disposal
- Public relations
- Valuation and compensation
- Livestock management and welfare

Wild animal manual

- Wild animal response strategy

Summary document

Enterprise manuals

- Artificial breeding centres
- Dairy processing
- Feedlots
- Meat processing
- Poultry industry
- Saleyards and transport
- Zoos

Management manuals

- Control centres management (Parts 1 and 2)
- Animal Emergency Management Information System
- Laboratory preparedness

⁵ The complete series of AUSVETPLAN documents is available on the internet at: http://www.animalhealthaustralia.com.au/programs/eadp/ausvetplan_home.cfm

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1 Nature of the disease

Scrapie is a progressive neurodegenerative disease of adult sheep and goats. The disease, which has been recognised for over 200 years, is one of the transmissible spongiform encephalopathies (TSEs) or 'prion' diseases. These diseases are characterised by long incubation periods during which time an abnormal, protease-resistant isoform of a prion protein accumulates in the central nervous system (CNS). Scrapie can be sporadic (a random occurrence with no known genetic or environmental cause), inherited (genetic) or transmissible (the abnormal prion is transmitted from one animal to another) (Prusiner 1998).

1.1 Aetiology and pathogenicity

A protease-resistant isoform (PrP^{Sc}) of a normal cellular prion protein (PrP) has a pivotal role in the pathogenesis of scrapie and, according to the prion hypothesis, is the sole scrapie transmissible agent. Different strains of scrapie (ie associated with different molecular forms of the prion protein) have been identified by studies in laboratory animals.

A particular feature of prions that accumulate in the bodies of animals with prion diseases is their resistance to inactivation by physical or chemical procedures. These include freezing, desiccation, ultraviolet (UV) radiation, burial, the usual methods for chemical and heat disinfection, and degradation by certain proteolytic enzymes (Taylor DM 1996ab, Taylor K 1996).

No agent can be detected in any tissues from lambs up to eight months of age although there is a report of the agent being detected in two-month-old lambs five weeks after experimental inoculation with the scrapie agent (Heggebo et al 2003). At 10-14 months of age, low infectivity can be detected in the large masses of lymphoreticular tissue in the intestines (Peyer's patches), lymph nodes associated with the gastrointestinal tract and elsewhere, spleen and tonsil. The titres in these tissues increase subsequently and, before clinical signs appear, infectivity can be detected in the spinal cord, medulla and some other areas of the brain. By the time animals show clinical disease, levels of infectivity in the CNS, including the spinal cord, have risen above those in the lymphoreticular system (OIE 1991).

1.2 Susceptible species

Sheep and goats are susceptible to scrapie, as well as mouflon (a species of wild sheep originating in Southeast Asia but introduced into many other countries). However, while breeds of sheep vary significantly in their susceptibility to the disease, goat breeds appear to be universally susceptible. Scrapie-free Merino and Poll Dorset sheep from Australia and New Zealand have normal frequencies of the scrapie-susceptible PrP genotypes. As well, Cheviot and Suffolk sheep of scrapie-susceptible genotypes have been found in Australia and New Zealand (Hunter and Cairns 1998).

While spongiform encephalopathies occur naturally in humans, there has been no recorded evidence of transmission of scrapie to humans despite scrapie being

recognised for over 200 years (see Detwiler and Baylis [2003] for a discussion of this issue).

1.3 World distribution and occurrence in Australia

Scrapie is present in several European Union Member States, especially the United Kingdom, Canada, the United States, Iceland, India, Japan and Brazil. Israel has also reported outbreaks of scrapie, with the most recent being in early 2007. There have been isolated reports of scrapie from a number of countries including Australia (1952), New Zealand (1954) and the Republic of South Africa (1972). In these instances, the disease was confined to imported sheep and was eradicated by destruction of the affected group.

For the latest information on the distribution of scrapie, refer to the OIE World Animal Health Information Database.⁶

1.4 Diagnostic criteria

Laboratory examination of tissues collected at a postmortem examination is essential to confirm a diagnosis.

1.4.1 Clinical signs

The earliest signs of disease are reduced exercise tolerance, followed by the development of an unsteady gait. Animals go to water frequently but drink little and begin to rub, especially the poll, the buttocks and the rump. After about two months, animals start to lose condition, lose their balance and become rapidly fatigued. They are excitable and signs of localised rubbing are obvious from loss of wool or hair. A nibbling response can be elicited by rubbing alongside the spine over the rump. Often a papular rash appears on haired parts of the skin. By three or four months after the first signs, animals are severely affected showing marked muscle wastage, and are confused and agitated. Finally, during the next two to four weeks they become unable to stand and die.

1.4.2 Pathology

Gross lesions

There are no characteristic gross pathological changes.

Microscopic lesions (histopathology)

The characteristic histological TSE changes in the CNS are vacuolation of grey matter neuropil (spongiform change) and/or vacuolation of neurons, the spread of astrocytes (cells that support neurones) and neuronal degeneration. In sheep with scrapie, these changes have a predilection for certain neuroanatomical nuclei, particularly within the brainstem, and are bilateral and usually symmetrical. The

⁶<http://www.oie.int/wahid-prod/public.php?page=home>

characteristic lesion profile in sheep is the basis for routine histological screening for scrapie. Accumulation of PrPSc can be demonstrated within these lesions.

1.4.3 Laboratory tests

Currently, laboratory diagnosis is based on histological changes in the brain. These tests can only be undertaken on tissues taken after death.

Specimens required

Any animal with progressive neurological disease should be killed in a way that avoids CNS damage. The brain, with the brainstem intact, is removed from the skull as soon as possible after death. An unfixed sample (3–10 g) of cervical spinal cord and/or medulla, caudal to the obex, is frozen for possible detection of PrPSc by western blotting, or as scrapie-associated fibrils by transmission electron microscopy. The rest of the brain, after appropriate microbiological sampling, is fixed without distortion in neutral buffered 10% formol saline for histological examination.

TSE agents (prions) are not inactivated by UV or gamma irradiation, normal autoclaving (120°C at 15 psi/101 kPa), aldehydes (glutaraldehyde, formaldehyde), boiling, dry heat sterilisation, ethylene oxide, acetone or alcohols. Recommended decontamination procedures include incineration, gravity displacement or porous load (prevacuum) autoclaving (134–138°C at 30 psi/203 kPa; holding time at temperature of 18 minutes for a single cycle, or 3 minutes for six separate cycles (some authorities advise holding times at temperature of at least one hour), and exposure of instruments and working surfaces to sodium hydroxide (1–2 M), or sodium hypochlorite (2–3% available chlorine) for at least one hour. Immersion of formalin-fixed tissue in 96% formic acid for one hour has been shown to reduce scrapie and Creutzfeldt-Jakob disease (CJD) infectivity substantially. For further information see the **Laboratory Preparedness Manual** and the National TSE Surveillance Guidelines (NTSESP), *National Guidelines for Field Operations*.⁷

Transport of specimens

Specimens should initially be sent to the state or territory diagnostic laboratory from where they will be forwarded to the CSIRO Australian Animal Health Laboratory (CSIRO-AAHL), Geelong for emergency disease testing. This should be done after obtaining the necessary clearance from the chief veterinary officer (CVO) of the state or territory of the disease outbreak, and after informing the CVO of Victoria about the transport of the specimens to Geelong.

Laboratory diagnosis

AAHL tests

Table 1 shows the tests for scrapie that are currently available at AAHL.

⁷ http://www.animalhealthaustralia.com.au/aahc/programs/adsp/tsefap/tse_ntsesp.cfm

Table 1 Laboratory tests currently available at CSIRO-AAHL for the diagnosis of scrapie

Test	Specimen required	Condition detected	Time taken to obtain result
Histopathology	Formalin-fixed brain tissue	Vacuolation of grey matter neuropil (spongiform change) and /or vacuolation of neurons, astrocytosis, neuronal degeneration	2 days
Immunohistochemistry	Formalin-fixed brain tissue or cervical spinal cord	Excessive accumulation of prion protein	1 day
Immunochemistry – Prionics® Immunoblot	Unfixed brain tissue containing obex or cervical spinal cord	Accumulation of abnormal prion protein	1 day
Electron microscopy	Unfixed brain tissue or cervical spinal cord	Scrapie-associated fibrils	2 days
Isolation of agent by intracerebral inoculation into mice ^a	Unfixed brain tissue or cervical spinal cord	Scrapie agent	Up to and beyond 1 year

^a This test is used to confirm transmissibility of a spongiform encephalopathy and to strain-type the causative agent

Source: Information provided by CSIRO-AAHL, 2006 (refer to CSIRO-AAHL for most up-to-date information).

Other tests

Tests to detect scrapie in the live animal have been developed, but while work is continuing, no test has yet been validated for scrapie diagnosis on an individual animal basis. The third-eyelid test involves the biopsy of the lymphoid tissue of the third eyelid and detection of abnormal prion material using immunohistochemistry techniques. Prions have been detected in this lymphoid tissue well in advance of development of clinical disease in the animal.

1.4.4 Differential diagnosis

Scrapie is a progressive disease of the nervous system and should be considered in the differential diagnosis of locomotor and neurological disorders of adult Australian sheep.

The following conditions should be considered in a differential diagnosis of scrapie:

- trauma to brain or spinal cord;
- brain or spinal abscess;
- external parasites such as lice, mites, mange and sheep scab;
- chronic enterotoxaemia (focal symmetrical encephalomalacia);
- maedi-visna;
- polioencephalomalacia;
- Aujeszky's disease;
- louping ill;
- listeriosis;

- hepatic encephalitis due to plant toxicity; and
- rabies.

An occurrence of scrapie in Australia would probably be associated with imported livestock (see Section 1.7). However, contaminated veterinary therapeutics are also a potential source of infection, as well as contaminated surgical instruments. If a contaminated therapeutic agent is the source of an outbreak, the disease may initially appear much more widespread than if the source is imported livestock.

1.4.5 Treatment of infected animals

There is no treatment for animals affected by scrapie and the disease is invariably fatal.

1.5 Resistance and immunity

1.5.1 Innate and passive immunity

There is well-documented evidence that susceptibility to scrapie is controlled by the PrP gene (Detwiler and Baylis 2003). The mechanisms of innate immunity are not completely understood in terms of resistance to infection and susceptibility to the development of disease. The long incubation period requires some caution in interpreting relative susceptibilities. However, more susceptible genotypes tend to have shorter incubation periods (Detwiler and Baylis 2003).

Despite breed variation and the identification of several naturally occurring scrapie strains with different attack rates, selection can lead to resistant flocks (Detwiler and Baylis 2003).

While the basis of PrP genetics in goats is similar to sheep, there are considerable genotype differences and more work is required in this species to understand the relative resistance to scrapie (Detwiler and Baylis 2003).

Passive immunity does not play any part in resistance to scrapie.

1.5.2 Active immunity

There is no acquired immunity to the scrapie agent.

1.5.3 Vaccination

Vaccination is not applicable to this disease.

1.6 Epidemiology

The epidemiology of scrapie is determined principally by the long incubation period, host resistance factors and the mode of transmission. It is important to recognise that, until the nature of scrapie resistance is well understood, exposed animals, irrespective of their genetic susceptibility (see Section 1.5.1, above) may be infected.

1.6.1 Incubation period

The incubation period is long. Following natural perinatal exposure, scrapie occurs most frequently between 2 and 5 years later, with a peak incidence at 3.5 years in sheep and somewhat less for goats.

The *OIE Terrestrial Animal Health Code* does not give a maximum incubation period.

1.6.2 Persistence of agent

General properties

As an aberrant protein, the scrapie agent is very resistant to physicochemical conditions that inactivate conventional viruses and bacteria; for example, the agent is resistant to most common disinfectants including ethanol, formaldehyde, iodophors and phenolics (see Section 2.3.8). The only completely effective disinfection methods are strong (20 000 ppm) sodium hypochlorite solutions applied for one hour, boiling in 1 M sodium hydroxide for at least one minute or gravity displacement autoclaving in the presence of sodium hydroxide (eg 121°C for 30–60 minutes plus 1 M or 2 M sodium hydroxide) (Williams 2003).

For items that will withstand steam sterilisation, and whose value justifies it, autoclaving at 134–136°C for at least 18 minutes is recommended. Steam sterilising at 121°C in the presence of 1 M sodium hydroxide, sodium hypochlorite treatment (1.4%) for 30 minutes or 1 M sodium hydroxide for at least one hour are also quite effective methods (although they do not guarantee absolute inactivation).

For specific requirements for the decontamination of a prion disease, see the **Laboratory Preparedness Manual** (Appendix 6).

Environment, equipment and personnel

The scrapie agent has been known to survive in a desiccated state for at least 30 months. Some infectivity remains after exposure to dry heat for 24 hours at 160°C; see Detwiler (1992) for further details.

Live animals

Sheep infected with scrapie have infective material principally in the CNS tissues, lymphoreticular system and placenta. There is no immune response to eliminate the agent and, because the disease has a long incubation period, transport of live, clinically normal animals during the incubation period have been the principal source of introduction of disease into countries. Goats may have a more limited distribution of the agent in tissues.

Animal products and byproducts

The scrapie agent is capable of surviving many procedures involved in the processing of animal products and byproducts.

1.6.3 Modes of transmission

Live animals

The transmission of scrapie primarily occurs from an infected ewe (or doe) to her progeny and other lambs or kids that are in close association around the time of parturition. Other forms of horizontal spread (such as indirect transmission through a contaminated environment including pastures, feed and water) are less likely (Detwiler and Baylis 2003).

There is no evidence that cattle are infected by sheep at pasture (Detwiler and Baylis 2003).

Animal products and byproducts

As the scrapie agent is capable of surviving many procedures involved in the processing of animal products and byproducts, it cannot be ruled out that some agent may be present in the final products. For this reason, Australia has prohibited the feeding of meat, bonemeal and other compounded feeds containing mammalian materials, to ruminants. Auditing procedures are in place nationally to ensure compliance with this legislation.

Equipment and personnel

Transmission by fomites should not be a real concern. However, consideration should be given, in particular, to avoiding transmission on instruments used for veterinary applications and surgery.

Vectors

There is no documented evidence for transmission of the scrapie agent by insect or arthropod vectors.

Semen and embryos

The scrapie agent has not been found in semen.

The International Embryo Transfer Society (IETS) lists scrapie as a Category 2 disease for in vivo derived embryo transfer in sheep. Category 2 diseases are those for which there is substantial evidence to show that the risk of transmission is negligible, provided that the embryos are properly handled between collection and transfer (as set out in the IETS Manual 1998, updated in 2004⁸) but for which additional transfers are required to verify existing data. For goats, the IETS states that either no conclusions are yet possible with regard to the level of transmission risk, or the risk of transmission via embryo transfer might not be negligible, even if the embryos are properly handled (as set out in the IETS Manual), between collection and transfer.

Additional information on the transmissibility of scrapie by embryo transfer may be found in Foote et al (1993) and Wang et al (2001).

⁸ <http://www.iets.org/manual.htm>

Biological products

Spongiform encephalopathy agents can be spread by inoculation of biologically derived therapeutic products (iatrogenic spread). There are two main situations when this may occur:

- Biological products derived from CNS extracts (in the same way as human pituitary gland extracts were contaminated with the agent for CJD). It is unlikely such a product would be legally imported and used.
- A therapeutic agent that has incorporated a contaminated ingredient in manufacture (for example contaminated brain-heart infusion broth used as a substrate for a bacterial vaccine). While this poses a theoretical threat, no cases of scrapie have been attributed to this mode of transmission. However, it is technically difficult to confirm the contamination of a particular batch of the therapeutic agent, especially because of the long incubation period of the disease.

1.6.4 Factors influencing transmission

The following factors could influence the transmission of scrapie:

- stocking densities;
- housing of sheep during lambing;
- breed; and
- feeding meatmeal.

Natural spread of scrapie under Australian conditions is likely to be inefficient because transmission from ewe or doe to progeny and other lambs or kids would be less common at lower stocking densities. However, spread of the agent by inoculation of a contaminated veterinary product would be much more efficient and an outbreak originating from such a source would affect many more animals in the flock at the one time.

1.7 Manner and risk of introduction to Australia

Any occurrence of scrapie in Australia can be reasonably expected to be an isolated event associated with imported livestock. With the stringent quarantine requirements placed on sheep and goats imported into Australia and the previous use of the Scrapie Freedom Assurance Program, it is very unlikely that this disease will be introduced with legally imported livestock.

Transmission from contaminated biological products would require the source of the product to be outside Australia (which is unlikely to be approved), or for some contaminated material to be inadvertently included in a formulation (possible if the ingredient has passed through several suppliers).

1.8 Social and economic effects

A major implication of an occurrence of scrapie in Australia would be the costs associated with restrictions on Australia's international trade in livestock and livestock products. The selected strategy must address the concerns of major

trading partners. It may be necessary to take actions and impose restrictions that are not technically justifiable in order to satisfy the requirements of trading partners.

Domestic consumer markets could also have concerns about product safety because of the link to bovine spongiform encephalopathy. This could affect local sales of sheep and goat meat and dairy products, and programs to counter these concerns will need to be in place. There could also be collateral impact on beef sales resulting from an incorrect association with BSE.

Processing establishments could be affected in the short term while consumer confidence in sheep and goat products is being re-established.

1.9 Criteria for proof of freedom

It is necessary to take rapid and decisive action in disposing of affected animals (and possibly high-risk animals), immediately implementing a thorough investigation to determine the source of infection, other suspect animals, and imposing strict quarantine and movement controls.

Programs must be in place to ensure producers and other agricultural workers are aware of the signs of the disease, are reporting suspicious cases, and that these are fully investigated.

Articles 14.9.2 to 14.9.4 of the OIE Terrestrial Code describe the procedures that need to be carried out in order for a country, zone or establishment to be recognised as free from scrapie. Proof of freedom after an outbreak can be achieved by the absence of clinical disease for seven years, as indicated by an appropriate level of surveillance, or by all establishments being accredited free.

2 Principles of control and eradication

2.1 Critical factors assessed in formulating response policy

Features of the disease:

- Scrapie is a progressive neurodegenerative disease of adult sheep and goats, characterised by a long incubation period.
- Transmission of scrapie primarily occurs from an infected ewe or doe to her progeny, and other lambs or kids that are in close association around the time of parturition.
- An incursion could be associated with imported animals or could have been introduced with biological products (iatrogenic transmission).
- The initial diagnosis may be delayed due to the often mild early clinical signs and the absence of a reliable test in the live animal.
- The agent would be persistent under Australian environmental conditions and is very resistant to inactivation by physical or chemical procedures.
- A vaccine is not available.
- There are no public health implications but a perceived association with BSE may complicate communications with the public.

Features of susceptible populations:

- Factors influencing the transmission of scrapie include stocking densities, housing of sheep during lambing, breed and feeding meatmeal.
- Susceptible to scrapie varies among breeds due to host resistance factors.
- Initial infections may be in small non-commercial flocks.
- Feral goat and small holder goat populations are not easily identified.
- Small holders have little knowledge of disease control issues and the need to report illness in their animals.
- Fear of repercussions may deter small holders from reporting disease.
- The first IP identified may not be the index case.
- Market fluctuations due to public health perceptions would reduce the value of the industry.

2.2 Options for control or eradication based on the assessed critical factors

Managing the risk of scrapie would be based on the identified critical factors:

- Registration of all commercial and small sheep and goat holdings;
- Application of mandatory biosecurity plans on identified premises;
- Management of eradication activities on the basis of a risk assessment, using the following risk categories:
 - *affected animals* – those showing clinical signs consistent with scrapie;
 - *equivalent risk animals* – any imported sheep or goat originating from the same property as affected animals, and the dams, litter mates and progeny of affected animals;
 - *exposed animals* – sheep or goats that have been in close physical contact with affected animals, especially around parturition; animals imported in the same group as affected animals; and animals exposed to invasive surgical equipment used on affected animals; and
 - *low-risk animals* – sheep or goats on the same property as affected animals that are not derived from those animals and have not been in direct or indirect physical contact with them;
- Implementation of premises-based movement controls;
- Destruction of all clinically affected, and equivalent risk and exposed animals, and testing them;
- Maintaining surveillance based on the recognition of clinical signs and the testing of dead animals;
- Development of grazing management plans;
- Implementation of appropriate zones and compartments.

The policy to be implemented in described in Section 3.

3 Policy and rationale

3.1 Introduction

Scrapie is an OIE-listed disease that is invariably fatal in clinically affected sheep and goats, and is significant in the international trade in sheep and goats, and their products. The disease does not spread quickly among animals and it is not necessary to decide on strategies in haste.

Scrapie is an Animal Health Australia Category 3 disease under the government-industry EAD Response Agreement for cost-sharing arrangements. Category 3 diseases are those for which costs will be shared 50% by government and 50% by industry.

The policy is to control and eradicate the disease as quickly as possible using a combination of strategies including:

- ☞ *a total management plan to focus the action on risk animals and to maximise the efficiency of the eradication program;*
- ☞ *quarantine and movement controls of animals, products and other potentially infected items to minimise the spread of infection;*
- ☞ *tracing and surveillance to determine the source and extent of infection and provide proof of freedom;*
- ☞ *risk assessment to identify the risk categories of livestock and to define further strategies;*
- ☞ *slaughter and sanitary disposal of all clinically affected, exposed and equivalent-risk stock (as defined in Section 2.1); and*
- ☞ *an awareness campaign to facilitate cooperation from the industry and the community.*

As any infected or suspect premises will be placed in individual quarantine, it is not necessary to establish a restricted or control area.

The chief veterinary officer (CVO) in the state or territory in which the outbreak occurs is responsible for developing an emergency animal disease (EAD) response plan for the particular outbreak.

The Consultative Committee on Emergency Animal Diseases (CCEAD), convened for the incident, assesses the EAD Response Plan drawn up by the CVO for technical soundness and consistency with AUSVETPLAN, and endorses or seeks modifications to it. Overall operational management of the incident rests with the CVO of the affected jurisdiction, with oversight by the CCEAD.

The National EAD Management Group (NMG), also convened for the specific incident, decides on whether cost-sharing will be invoked (following advice from the CCEAD) and manages the national policy and resourcing needs.

For further details, refer to the **Summary Document**.

CVOs will implement disease control measures as agreed in the EAD Response Plan and in accordance with relevant legislation. They will make ongoing decisions on follow-up disease control measures in consultation with the CCEAD and the NMG. The detailed control measures adopted will be determined using the principles of control and eradication (see Section 2) and epidemiological information about the outbreak.

For information on the responsibilities of the state or territory disease control headquarters and local disease control centres, see the **Control Centres Management Manual, Part 1**.

3.2 Control and eradication policy

The general strategy will be to destroy and dispose of affected animals immediately, quarantine the infected premises (IP), and undertake tracing and surveillance, and a risk assessment of the information obtained so that more detailed eradication planning decisions can be implemented. As scrapie is spread slowly between animals, it is not essential for plans to be made in haste and strategies should be carefully planned. Suspect premises (SPs) will need to be quarantined and an appropriate level of movement controls placed on animals and products.

The strategy of quarantine and movement controls, slaughter of risk animals, tracing and risk assessment, laboratory evaluation and decontamination, will be used regardless of the source of infection. When the source of the introduction has been determined, the extent of the actions required will be decided. Good farm biosecurity and progressive destocking will be employed where the disease may be present in specific groups on particular farms.

As the presence of the disease will lead to national and international disruption to trade, regular and ongoing liaison with industry, the media, public health officials and the public is an integral part of the strategy for eradication. This will be particularly important as a control or eradication program may be prolonged due to the long incubation period of the disease.

3.2.1 Stamping out

The occurrence of disease in one flock or herd or a few flocks or herds will be addressed by the prompt destruction of all clinically affected sheep and goats. Risk assessment will then define further actions and strategies. This may include the destruction and laboratory assessment of high-risk groups (that is: equivalent risk animals and exposed animals; see Section 2.2). Further actions would be defined by findings from these animals.

Affected animals should be promptly destroyed and tested. This will remove real or perceived disease risks and allow a definitive diagnosis. Animals in other risk categories may be destroyed or placed under quarantine.

As brain material is required for diagnosis, animals should not be shot through the head. In addition, shooting will increase the risk of dissemination of the agent in the environment. It is recommended that animals be killed by the administration of

an intravenous euthanasia agent. Postmortem examinations should be carried out as close to the site of disposal as possible. Wherever possible, carcasses should be incinerated.

In the event of an outbreak of scrapie not traceable to imported animals, the source of the infection will need to be determined and investigations conducted (including the destruction and testing of sufficient animals) with a view to establishing the distribution and prevalence of infection.

Management options for disposal should be left as flexible as possible in order that disease control authorities, industry bodies and owners can reach the most cost-effective option for the industry and the community as a whole. The best option will, to some extent, be determined by the source and extent of the outbreak.

Stamping out may be adopted for some groups to overcome long and costly ongoing surveillance and quarantine, or due to international and/or domestic trade issues, or when property biosecurity cannot be maintained at a level that can ensure eradication.

Sentinel animals and restocking

If all animals and potentially infected materials have been removed, there is no risk to newly introduced animals. Placing sentinel animals is inappropriate because of the disease's long incubation period.

3.2.2 Quarantine and movement controls

Infected premises (IPs, containing affected animals) and suspect premises (SPs, containing equivalent risk, exposed and low-risk animals) will be placed into immediate quarantine while the tracing and epidemiological investigations are being completed and movement controls introduced. The ongoing level of quarantine and controls on movement will be determined by epidemiological investigations and the risk classification of the animals involved on the various premises. Declaration of restricted and control areas is not required for scrapie.

Where property biosecurity is unsatisfactory, controlled herd depopulation over a period of 6–12 months will be considered. Long-term quarantine of some groups of animals may be necessary.

Some premises may have animals in more than one risk category and these will be subject to different management practices and controls.

See Section 4 for further details on declared areas and movement controls.

3.2.3 Tracing and surveillance

Tracing and surveillance will be used to attempt to establish the source of the disease and define the extent of spread. The priority given to tracing and surveillance will depend to a large extent on the risk classification of the affected animals. Even in the event of the infection being introduced through importation of an animal or genetic material, it is possible that, because of its long incubation period, the disease could be widespread by the time it is detected.

Suspect animals will be carefully examined at regular intervals to determine the presence of any characteristic clinical signs. Animals that develop clinical signs suggestive of scrapie will be destroyed for laboratory examination of the central nervous system; animals over two-years old will be subject to a statistically valid sample for evidence of scrapie. Surveillance will need to be maintained for a prolonged period and may need to be lifelong.

A major problem could arise in the event of the implication of a contaminated therapeutic agent as the source of the disease. It is likely that if a single contaminated therapeutic administration has been the source of the disease, most infected animals will have similar degenerative neurological changes. Information about the attack rate will assist in risk assessment of the index flock and surveillance of other flocks exposed to the same product.

Failure to identify a source would preclude immediate risk assessment of the index flock and necessitate more widespread investigation and surveillance before developing a control/eradication strategy.

See Section 1.9 for information on proof of freedom.

3.2.4 Zoning and compartmentalisation

It would be expected that, when first detected, scrapie would be confined to one property or a few foci that could be readily isolated. Therefore, zoning is unlikely to be appropriate for scrapie, but compartmentalisation (for example through an industry accreditation program) may be used.

Zoning might be considered if the disease occurs in a geographically well-defined area.

Grazing management

Apart from via the placenta of infected ewes, environmental excretion of the scrapie agent is minimal, and there is minimal risk of horizontal spread of scrapie other than under intensive husbandry systems. Confined areas associated with lambing ewes and slaughter sites will be considered significantly contaminated.

Grazing management plans will be developed to keep breeding and young stock away from high-risk areas. These plans will identify grazing and management practices to minimise the risk of further transmission of the agent, for example grazing adult wethers or cattle on the area or using crop rotations for a period of time. Where property security and management are unsatisfactory, controlled flock depopulation will be considered.

3.2.5 Vaccination

Vaccination will not be carried out for this disease.

3.2.6 Treatment of infected animals

Infected animals will not be treated.

3.2.7 Treatment of animal products

There is no treatment for animal products that is guaranteed to be effective in inactivating the scrapie agent under normal commercial operations. Meat or animal products from confirmed cases of scrapie will not be rendered for meat-and-bonemeal or for other products, but will be disposed of by incineration.

Meat and meat products from affected animals must not enter the animal or human food chain. Offal from suspect animals must not be used for the production of meatmeal and bonemeal. The Agricultural and Resource Management Council of Australia and New Zealand (ARMCANZ) agreed in 1997 that mammalian-derived proteins should not be fed to ruminants.

3.2.8 Disposal of animals and animal products

Wherever possible, carcasses will be incinerated in such a way as to ensure that all contaminated material is completely burned. In selecting a site for burning carcasses on a pyre, consideration will be given to the future use of the area.

Where incineration is not practical, carcasses and other materials that cannot be adequately decontaminated will be buried in a site after appropriate consideration to the future use of the burial site, as the agent will remain in the soil for many months.

For further information, see the **Disposal Manual**.

3.2.9 Decontamination

Decontamination of the scrapie agent is difficult, but is required for items of valuable equipment that may have become contaminated through close contact with infected animals or carcasses, or exposed stock at parturition. Effective surface disinfectants are available but should be used with caution. Good property biosecurity should be implemented for contaminated areas.

It will be necessary to carry out intensive clean-up of areas identified as potentially heavily contaminated (eg postmortem sites, intensive lambing areas and laboratories) because of the persistence of the agent in the environment. Efforts will be focused on these areas.

For further information see Section 1.6.2 and the **Decontamination Manual**.

3.2.10 Wild animal and vector control

To prevent scavenging by wild carnivores, omnivores and by ruminants that eat bone as a source of phosphorus (osteophagia), carcasses should be incinerated.

If scrapie occurs in goats or sheep that have contact with feral goats, it would be important to establish some form of surveillance of feral goat populations to determine whether these animals have become a reservoir of the agent.

Vector control is not applicable.

3.2.11 Public awareness and media

Advice to the media must be carefully considered. It is necessary to inform the public, especially those in the livestock industries, of the circumstances of the outbreak and any trade implications. Although any risk of transmission of scrapie to humans is considered to be negligible (see Section 1.2), it is highly likely that the disease will be linked to bovine spongiform encephalopathy and be widely publicised by the media as a potential human health risk. This could lead to unnecessary public alarm, with significant effect on domestic and international trade. There is likely to be further public concern if major trading partners decline to accept Australian exports.

Media liaison officers need to be prepared for this issue and able to provide a clear, easily understood explanation and information on the disease. Early discussions with human health authorities are essential, in order to ensure that a consistent public health position is developed. In addition, advice should be given that products regarded as a significant risk of containing the agent would not be allowed to enter the food chain. However, it will be difficult to give these assurances if the source of the disease is a therapeutic agent that has been widely used for some time. There may be some additional concern if the ingredient implicated as the source of the disease has been used to prepare human therapeutics. For further information see the **Public Relations Manual**.

3.2.12 Public health implications

There has been no evidence of transmission of scrapie to humans. However, persons involved in handling potentially infected material must take precautions to avoid exposure to the agent or other pathogens. Veterinarians, laboratory workers and slaughterhouse workers should wear gloves and eye protection. Care should be taken to minimise environmental contamination during postmortem procedures.

At present, it is not considered that there are any public health issues.

3.3 Other policies

If scrapie becomes established in Australia, the policy chosen for controlling it will depend on the distribution (geographic, species, breed and even breeding line) and the perceived mode of transmission. Establishment of scrapie within a breed or breeding line of sheep could be addressed by gradual elimination of that line from the national flock, or by breeding for resistant offspring. Due to the nature of scrapie, there will be adequate time to plan the strategies in the event that scrapie becomes endemic.

In the event of scrapie becoming established, eradication would require drastic action in relation to specific risk categories of animals with possible wider stamping out and restrictive controls on animal and product movements.

A widespread dissemination of scrapie by inoculation of a contaminated therapeutic agent would require a protracted program of monitoring and a high level of industry cooperation to eliminate the disease. The nature of sheep farming in Australia would minimise the likelihood of transmission of the disease in the field. Eradication of the disease would require extensive record keeping by

commercial farmers, and a program of accreditation for studs might assist the process.

3.4 Funding and compensation

Scrapie is classified as a Category 3 emergency animal disease under the EAD Response Agreement between the governments of Australia and the livestock industries.

Category 3 diseases are emergency animal diseases that have the potential to cause significant (but generally moderate) national socioeconomic consequences through international trade losses, market disruptions involving two or more states and severe production losses to affected industries, but have minimal or no effect on human health or the environment. For this category, the costs will be shared 50% by governments and 50% by the relevant industries (refer to the EAD Response Agreement for details).⁹

Information on the cost-sharing arrangements can be found in the **Summary Document** and in the **Valuation and Compensation Manual**.

⁹ <http://www.animalhealthaustralia.com.au/programs/ealp/eadra.cfm>

4 Recommended quarantine and movement controls

4.1 Guidelines for classifying declared areas

A declared area is a part of a country with defined boundaries that is subject to mandatory disease control measures (such as animal movement controls, animal destruction, decontamination) under emergency animal disease legislation. Types of declared areas include restricted area, control area, infected premises, dangerous contact premises and suspect premises, but not all classifications are relevant to all diseases.

4.1.1 Declared premises

Infected premises

A premises classified as an infected premises (IP) will be a defined area (which may be all or part of a property) in which scrapie or the scrapie disease agent exists, or is believed to exist. An IP will be subject to quarantine served by notice and to eradication and control procedures.

Dangerous contact premises

Not applicable.

Suspect premises

Note: This may be a difficult classification to use owing to the length of the incubation period; it would be a temporary classification, as stated below, but could be in place for years.

Premises classified as suspect premises (SPs) will be those that contain animals that have possibly been exposed to the scrapie disease agent, such that quarantine and surveillance, but not pre-emptive slaughter, are warranted; OR animals not known to have been exposed to the scrapie disease agent but showing clinical signs requiring differential diagnosis.

For scrapie, premises classified as SPs will be those containing (see Section 2.2):

- *equivalent risk animals* – any imported sheep or goats originating from the same property as affected animals, and the dams, litter mates and progeny of affected animals.
- *exposed animals* – sheep or goats that have been in close physical contact with affected animals, especially around parturition; animals imported in the same group as affected animals; and animals exposed to invasive surgical equipment used on affected animals.
- *low-risk animals* – sheep or goats on the same property as affected animals that are not derived from those animals and that have not been in close physical contact with them.

‘Suspect premises’ is a temporary classification because the premises contain animals that are suspected of having the disease. High priority should be given to clarifying the status of the suspect animals so that the SP can be reclassified either as an IP and appropriate quarantine and movement controls implemented, or as free from disease, in which case no further disease control measures are required.

4.1.2 Declared areas

Restricted area (RA)

Not applicable.

Control area (CA)

Not applicable.

4.2 Movement controls for scrapie

4.2.1 Declared premises

Table 2 shows the movement controls that will apply to IPs and SPs in the event of a scrapie incident. As noted in Section 4.1, the classification dangerous contact species will not be used in the case of a scrapie outbreak.

Table 2 Movement controls for declared premises

Quarantine/movement controls	Infected premises	Suspect premises
<i>Movement out of:</i>		
- susceptible animals	Subject to permit and dependent on risk assessment.	Subject to permit and dependent on risk assessment.
- other animals	Subject to permit and dependent upon risk assessment.	Subject to permit and dependent upon risk assessment.
- specified products (including game meat from feral goats)	Subject to permit.	Subject to permit.
- grain and crops	No restriction.	No restriction.
<i>Movement in and out of:</i>		
- people and vehicles	No restriction.	No restriction.

Quarantine/movement controls	Infected premises	Suspect premises
- equipment	No restriction, except for equipment that has been in contact with risk animals. Such equipment (especially surgical equipment) will require decontamination before movement out of infected premises and follow-up decontamination as necessary (or incineration).	No restriction, except for equipment that has been in contact with risk animals. Such equipment (especially surgical equipment) will require decontamination before movement out of suspect premises and follow-up decontamination as necessary (or incineration).
<i>Movement in of:</i>		
- susceptible animals	No restriction but advise owner of implications.	No restriction but advise owner of implications.

4.2.2 Declared areas

Restricted and control area declarations are not applicable for scrapie.

4.3 Criteria for issuing permits

When conducting a risk assessment regarding the issue of a permit, the officer should take into account the following:

- status of the originating and destination premises;
- species of animal;
- confidence in animal tracing and surveillance;
- destination and use of the animals or products;
- likelihood of contamination of the equipment/product/material (ability to decontaminate); and
- security of transport.

Appendix 1 Features of scrapie

Disease and cause

Scrapie is a progressive neurodegenerative disease of adult sheep and goats. The disease is one of the transmissible spongiform encephalopathies (TSEs) or 'prion' diseases. These diseases have long incubation periods during which time an abnormal form of the prion protein (PrP) builds up in the central nervous system. Scrapie can be sporadic (a random occurrence with no known genetic or environmental cause), inherited (genetic) or transmissible (where the abnormal prion is transmitted from one animal to another).

Species affected

Sheep and goats are affected, as well as mouflon (a species of wild sheep). The development of clinical signs varies between sheep breeds, but all goat breeds appear to be universally susceptible.

Spongiform encephalopathies occur naturally in humans (eg Creutzfeldt-Jakob disease, or CJD), but there is no evidence that the scrapie agent is transmissible to humans.

Distribution

Scrapie has been a recognised disease of sheep and goats for over 200 years. It is present in many sheep-raising countries including several European Union Member States, Canada, the United States, Israel, Iceland, India, Japan and Brazil. The disease occurred in imported animals in Australia in 1952 and in New Zealand in 1954, but the outbreaks were eradicated and the disease has not recurred.

Key signs

Because of the slow, progressive nature of the disease, signs only appear in animals 2-5 years old. Affected animals show reduced tolerance of exercise, followed by an unsteady gait and rubbing of the head, buttocks and rump. The animals start to lose condition, have difficulty standing and become rapidly fatigued. A skin rash appears and wool is lost at the site of rubbing. Further muscle wastage occurs as the condition worsens; the animal becomes confused, agitated and unable to stand, and dies.

Spread

The disease is mainly spread from an infected ewe (or doe) to her lamb (or kid), and to other lambs or kids that are in close association around the time of the birth. Spread by close contact between other susceptible animals can occasionally occur. Other forms of spread, such as by contact with a contaminated environment (including pastures, feed and water), are less likely.

Persistence of the agent

The scrapie agent (prion) is very resistant and can survive for several years in the environment and in animal products. High-temperature and high-pressure rendering is required to inactivate the agent. Most common disinfectants are ineffective, but it is extremely unlikely that enough of the agent to cause disease would be ingested from environmental contamination.

Control strategy

If an outbreak of scrapie occurs in Australia, the strategy is to develop a total management plan focusing on risk animals, with destruction and disposal of all clinically affected stock, quarantine of infected and suspect premises, and tracing and surveillance to provide proof of freedom from the disease. This would be combined with a detailed risk assessment to identify stock that have a high probability of infection because of lineage or contact with confirmed cases.

Glossary

Allele	One of the alternative forms of a specified gene. Different alleles usually have different effects on the phenotype.
Animal byproducts	Products of animal origin that are not for consumption but are destined for industrial use (eg hides and skins, fur, wool, hair, feathers, hooves, bones, fertiliser).
Animal Health Committee	A committee comprising the CVOs of Australia and New Zealand, Australian state and territory CVOs, Animal Health Australia, and a CSIRO representative. The committee provides advice to PIMC on animal health matters, focusing on technical issues and regulatory policy (formerly called the Veterinary Committee). <i>See also</i> Primary Industries Ministerial Council (PIMC)
Animal products	Meat, meat products and other products of animal origin (eg eggs, milk) for human consumption or for use in animal feedstuff.
Australian Chief Veterinary Officer	The nominated senior veterinarian in the Australian Government Department of Agriculture, Fisheries and Forestry who manages international animal health commitments and the Australian Government's response to an animal disease outbreak. <i>See also</i> Chief veterinary officer
AUSVETPLAN	<i>Australian Veterinary Emergency Plan</i> . A series of technical response plans that describe the proposed Australian approach to an emergency animal disease incident. The documents provide guidance based on sound analysis, linking policy, strategies, implementation, coordination and emergency-management plans.
Biological products	Agents of biological origin (eg sera, hormones) for therapeutic use in the diagnosis or treatment of certain diseases.
Chief veterinary officer (CVO)	The senior veterinarian of the animal health authority in each jurisdiction (national, state or territory) who has responsibility for animal disease control in that jurisdiction. <i>See also</i> Australian Chief Veterinary Officer
Compartmentalisation	The process of defining, implementing and maintaining one or more disease-free establishments under a common biosecurity management system in accordance with OIE guidelines, based on applied biosecurity measures and surveillance, in order to facilitate disease control and/or trade.

	One or more premises where animals are kept under a common biosecurity management system and containing an animal subpopulation with a distinct health status with respect to a specific disease for which required surveillance, control and biosecurity measures have been applied for the purpose of disease control and/or trade.
Compensation	The sum of money paid by government to an owner for stock that are destroyed and property that is compulsorily destroyed because of an emergency animal disease. <i>See also</i> Cost-sharing arrangements, Emergency Animal Disease Response Agreement
Consultative Committee on Emergency Animal Diseases (CCEAD)	A committee of state and territory CVOs, representatives of CSIRO Livestock Industries and the relevant industries, and chaired by the Australian CVO. CCEAD convenes and consults when there is an animal disease emergency due to the introduction of an emergency animal disease of livestock, or other serious epizootic of Australian origin.
Control area	A declared area in which the conditions applying are of lesser intensity than those in a restricted area (the limits of a control area and the conditions applying to it can be varied during an outbreak according to need). <i>See</i> Section 4.1) for further details
Cost-sharing arrangements	Arrangements agreed between governments (national and states/territories) and livestock industries for sharing the costs of emergency animal disease responses. <i>See also</i> Compensation, Emergency Animal Disease Response Agreement
Dangerous contact animal	A susceptible animal that has been designated as being exposed to other infected animals or potentially infectious products following tracing and epidemiological investigation.
Dangerous contact premises	Premises that contain dangerous contact animals or other serious contacts. <i>See</i> Section 4.1 for further details
Declared area	A defined tract of land that is subjected to disease control restrictions under emergency animal disease legislation. Types of declared areas include <i>restricted area, control area, infected premises, dangerous contact premises and suspect premises</i> . <i>See</i> Section 4.1 for further details
Decontamination	Includes all stages of cleaning and disinfection.
Depopulation	The removal of a host population from a particular area to control or prevent the spread of disease.
Destroy (animals)	To slaughter animals humanely.
Disinfectant	A chemical used to destroy disease agents outside a living animal.

Disease agent	A general term for a transmissible organism or other factor that causes an infectious disease.
Disease Watch Hotline	24-hour freecall service for reporting suspected incidences of exotic diseases – 1800 675 888 .
Disinfectant	A chemical used to destroy disease agents outside a living animal.
Disinfection	The application, after thorough cleansing, of procedures intended to destroy the infectious or parasitic agents of animal diseases, including zoonoses; applies to premises, vehicles and different objects that may have been directly or indirectly contaminated.
Disposal	Sanitary removal of animal carcasses, animal products, materials and wastes by burial, burning or some other process so as to prevent the spread of disease.
Emergency animal disease	A disease that is (a) exotic to Australia or (b) a variant of an endemic disease or (c) a serious infectious disease of unknown or uncertain cause or (d) a severe outbreak of a known endemic disease, and that is considered to be of national significance with serious social or trade implications. <i>See also</i> Endemic animal disease, Exotic animal disease
Emergency Animal Disease Response Agreement	Agreement between the Australian and state/territory governments and livestock industries on the management of emergency animal disease responses. Provisions include funding mechanisms, the use of appropriately trained personnel and existing standards such as AUSVETPLAN. <i>See also</i> Compensation, Cost-sharing arrangements
Endemic animal disease	A disease affecting animals (which may include humans) that is known to occur in Australia. <i>See also</i> Emergency animal disease, Exotic animal disease
Enterprise	<i>See</i> Risk enterprise
Epidemiological investigation	An investigation to identify and qualify the risk factors associated with the disease. <i>See also</i> Veterinary investigation
Exotic animal disease	A disease affecting animals (which may include humans) that does not normally occur in Australia. <i>See also</i> Emergency animal disease, Endemic animal disease
Exotic fauna/feral animals	<i>See</i> Wild animals
Fomites	Inanimate objects (eg boots, clothing, equipment, instruments, vehicles, crates, packaging) that can carry an infectious disease agent and may spread the disease through mechanical transmission.
Genetic locus	The genetic position (on a chromosome) occupied by the alleles of a specified gene.

Iatrogenic disease	A case of disease caused by medical or veterinary procedures (eg an infection spread by surgical procedures).
In-contact animals	Animals that have had close contact with infected animals, such as noninfected animals in the same group as infected animals.
Incubation period	The period that elapses between the introduction of the pathogen into the animal and the first clinical signs of the disease.
Index case	The first or original case of the disease to be diagnosed in a disease outbreak on the index property.
Index flock	The first or original flock in which a case of the disease has been diagnosed. <i>See also</i> Index case, Index property
Index property	The property on which the first or original case (index case) in a disease outbreak is found to have occurred.
Infected premises	A defined area (which may be all or part of a property) in which an emergency disease exists, is believed to exist, or in which the infective agent of that emergency disease exists or is believed to exist. An infected premises is subject to quarantine served by notice and to eradication or control procedures. <i>See</i> Section 4.1 for further details
Local disease control centre (LDCC)	An emergency operations centre responsible for the command and control of field operations in a defined area.
Monitoring	Routine collection of data for assessing the health status of a population. <i>See also</i> Surveillance
Mouflon	A species of wild sheep of the Caprinae family (goat antelopes). Thought to be one of the two ancestors for all modern domestic sheep breeds.
Movement control	Restrictions placed on the movement of animals, people and other things to prevent the spread of disease.
National management group (NMG)	A group established to direct and coordinate an animal disease emergency. NMGs may include the chief executive officers of the Australian Government and state or territory governments where the emergency occurs, industry representatives, the Australian CVO (and chief medical officer, if applicable) and the chairman of Animal Health Australia.
Native wildlife	<i>See</i> Wild animals
OIE Terrestrial Code	<i>OIE Terrestrial Animal Health Code</i> . Reviewed annually at the OIE meeting in May and published on the internet at: http://www.oie.int/eng/normes/mcode/a_summry.htm

OIE Terrestrial Manual	<i>OIE Manual of Standards for Diagnostic Tests and Vaccines for Terrestrial Animals</i> . Describes standards for laboratory diagnostic tests and the production and control of biological products (principally vaccines). The current edition is published on the internet at: http://www.oie.int/eng/normes/mmanual/a_summry.htm
Operational procedures	Detailed instructions for carrying out specific disease control activities, such as disposal, destruction, decontamination and valuation.
Owner	Person responsible for a premises (includes an agent of the owner, such as a manager or other controlling officer).
Peyer's patches	Lymphoid organs in the small intestines.
Premises	A tract of land including its buildings, or a separate farm or facility that is maintained by a single set of services and personnel.
Prevalence	The proportion (or percentage) of animals in a particular population affected by a particular disease (or infection or positive antibody titre) at a given point in time.
Primary Industries Ministerial Council (PIMC)	The council of Australian national, state and territory and New Zealand ministers of agriculture that sets Australian and New Zealand agricultural policy (formerly the Agriculture and Resource Management Council of Australia and New Zealand). <i>See also</i> Animal Health Committee
Quarantine	Legal restrictions imposed on a place or a tract of land by the serving of a notice limiting access or egress of specified animals, persons or things.
Rendering	Processing by heat to inactivate infective agents. Rendered material may be used in various products according to particular disease circumstances.
Restricted area	A relatively small declared area (compared to a control area) around an infected premises that is subject to intense surveillance and movement controls. <i>See</i> Section 4.1 for further details
Risk assessment	Assessment of the relative likelihood of an event, taking into consideration all relevant available information and uncertainties.
Risk enterprise	A defined livestock or related enterprise, which is potentially a major source of infection for many other premises. Includes intensive piggeries, feedlots, abattoirs, knackeries, saleyards, calf scales, milk factories, tanneries, skin sheds, game meat establishments, cold stores, artificial insemination centres, veterinary laboratories and hospitals, road and rail freight depots, showgrounds, field days, weighbridges, garbage depots.

Sensitivity	The proportion of affected individuals in the tested population that are correctly identified as positive by a diagnostic test (true positive rate). <i>See also</i> Specificity
Sentinel animal	Animal of known health status that is monitored to detect the presence of a specific disease agent.
Serotype	A subgroup of microorganisms identified by the antigens carried (as determined by a serology test).
Specificity	The proportion of nonaffected individuals in the tested population that are correctly identified as negative by a diagnostic test (true negative rate). <i>See also</i> Sensitivity
Spongiform encephalopathies	A group of diseases affecting various animal species; all involve noninflammatory vacuolated (spongiform) degeneration of the grey matter areas of the brain and spinal cord.
Stamping out	Disease eradication strategy based on the quarantine and slaughter of all susceptible animals that are infected or may have been exposed to the disease.
State or territory disease control headquarters	The emergency operations centre that directs the disease control operations to be undertaken in that state or territory.
Surveillance	A systematic program of investigation designed to establish the presence, extent of, or absence of a disease, or of infection or contamination with the causative organism. It includes the examination of animals for clinical signs, antibodies or the causative organism.
Susceptible animals	Animals that can be infected with a particular disease.
Suspect animal	An animal that may have been exposed to an emergency disease such that its quarantine and intensive surveillance, but not pre-emptive slaughter, is warranted. <i>or</i> An animal not known to have been exposed to a disease agent but showing clinical signs requiring differential diagnosis.
Suspect premises	Temporary classification of premises containing suspect animals. After rapid resolution of the status of the suspect animal(s) contained on it, a suspect premises is reclassified either as an infected premises (and appropriate disease control measures taken) or as free from disease. <i>See</i> Section 4.1 for further details
Tracing	The process of locating animals, persons or other items that may be implicated in the spread of disease, so that appropriate action can be taken.

Vaccination	Inoculation of healthy individuals with weakened or attenuated strains of disease-causing agents to provide protection from disease.
Vaccine	Modified strains of disease-causing agents that, when inoculated, stimulate an immune response and provide protection from disease.
Vector	A living organism (frequently an arthropod) that transmits an infectious agent from one host to another. A <i>biological</i> vector is one in which the infectious agent must develop or multiply before becoming infective to a recipient host. A <i>mechanical</i> vector is one that transmits an infectious agent from one host to another but is not essential to the life cycle of the agent.
Veterinary investigation	An investigation of the diagnosis, pathology and epidemiology of the disease. <i>See also</i> Epidemiological investigation
Wild animals	
- native wildlife	Animals that are indigenous to Australia and may be susceptible to emergency animal diseases (eg bats, dingoes, marsupials).
- feral animals	Domestic animals that have become wild (eg cats, horses, pigs).
- exotic fauna	Nondomestic animal species that are not indigenous to Australia (eg foxes).
Zoning	The process of defining, implementing and maintaining a disease-free or infected area in accordance with OIE guidelines, based on geopolitical and/or physical boundaries and surveillance, in order to facilitate disease control and/or trade.
Zoonosis	A disease of animals that can be transmitted to humans.

Abbreviations

AAHL	Australian Animal Health Laboratory
AUSVETPLAN	Australian Veterinary Emergency Plan
CCEAD	Consultative Committee on Emergency Animal Diseases
CJD	Creutzfeldt-Jakob disease
CNS	central nervous system
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CVO	chief veterinary officer
IETS	International Embryo Transfer Society
IP	infected premises
NMG	national management group
OIE	World Organisation for Animal Health (Office International des Epizooties)
PrP	prion protein
PrP ^{Sc}	protease-resistant isoform
SP	suspect premises
TSE	transmissible spongiform encephalopathies
UV	ultraviolet

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Video/training resources

See the Summary document for information on video/training resources.