AUSTRALIAN VETERINARY EMERGENCY PLAN

AUSVETPLAN

Disease strategy

Aujeszky's disease

Version 4.1

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.

National Biosecurity Committee
# Contents

1 **Introduction** .................................................................................................................. 6
    1.1 Scope of this manual ................................................................................................. 6
    1.2 Structure of AUSVETPLAN ...................................................................................... 6
    1.3 Nationally agreed standard operating procedures .................................................. 8
    1.4 World Organisation for Animal Health listing ....................................................... 8
    1.5 Australian emergency animal disease listing ......................................................... 8
    1.6 Manner and risk of introduction to Australia .......................................................... 9
    1.7 Social and economic effects ..................................................................................... 9

2 **Nature of the disease** ..................................................................................................... 10
    2.1 Aetiology and pathogenicity .................................................................................... 10
    2.2 Susceptible species ................................................................................................. 10
    2.3 World distribution and occurrence in Australia ..................................................... 10
        2.3.1 World distribution ......................................................................................... 10
        2.3.2 Occurrence in Australia ................................................................................ 10
    2.4 Epidemiology .......................................................................................................... 11
        2.4.1 Incubation period ......................................................................................... 11
        2.4.2 Persistence of agent and modes of transmission ........................................ 11
        2.4.3 Factors influencing transmission .................................................................. 14
    2.5 Diagnostic criteria ................................................................................................... 14
        2.5.1 Case definition ............................................................................................. 15
        2.5.2 Clinical signs ............................................................................................... 15
        2.5.3 Pathology ..................................................................................................... 16
        2.5.4 Differential diagnosis .................................................................................. 17
        2.5.5 Laboratory tests ........................................................................................... 17
    2.6 Resistance and immunity .......................................................................................... 21
        2.6.1 Innate immunity ........................................................................................... 21
        2.6.2 Acquired immunity ....................................................................................... 21
    2.7 Vaccination and/or treatment of infected animals ................................................ 21

3 **Principles of control and eradication** .......................................................................... 23
    3.1 Critical factors for formulating response policy .................................................... 23
        3.1.1 Features of the disease ................................................................................. 23
        3.1.2 Features of susceptible populations ........................................................... 23
    3.2 Options for control and eradication based on the critical factors ......................... 24

4 **Policy and rationale** ..................................................................................................... 25
    4.1 Introduction ............................................................................................................. 25
        4.1.1 Summary of policy ....................................................................................... 25
        4.1.2 Case definition ............................................................................................. 26
        4.1.3 Cost-sharing arrangement ............................................................................ 26
        4.1.4 Criteria for proof of freedom ....................................................................... 26
        4.1.5 Governance .................................................................................................. 26
    4.2 Public health implications ......................................................................................... 27
    4.3 Control and eradication policy .................................................................................. 28
        4.3.1 Stamping out .................................................................................................. 28
        4.3.2 Quarantine and movement controls ............................................................ 29
4.3.3  Tracing and surveillance ................................................................. 29
4.3.4  Zoning and compartmentalisation for international trade ............ 31
4.3.5  Vaccination .................................................................................. 32
4.3.6  Treatment of infected animals ..................................................... 32
4.3.7  Treatment of animal products and byproducts ................................ 32
4.3.8  Disposal of animals, and animal products and byproducts ........... 33
4.3.9  Decontamination ....................................................................... 33
4.3.10 Wild animal control .................................................................... 33
4.3.11 Vector control ............................................................................. 33
4.3.12 Public awareness and media ....................................................... 33

4.4  Other strategies ............................................................................... 34

4.5  Funding and compensation .............................................................. 35

4.5.1  General considerations ................................................................. 35

5  Guidelines for classifying declared areas and premises ..................... 36

5.1  Declared areas ............................................................................... 36

5.1.1  Restricted area (RA) .................................................................... 36
5.1.2  Control area (CA) ....................................................................... 37
5.1.3  Outside area (OA) ....................................................................... 37
5.1.4  Other types of areas .................................................................... 37

5.2  Declared premises .......................................................................... 37

5.2.1  Infected premises (IP) ................................................................. 38
5.2.2  Suspect premises (SP) ................................................................. 38
5.2.3  Trace premises (TP) .................................................................... 39
5.2.4  Dangerous contact premises (DCP) ............................................. 39
5.2.5  Dangerous contact processing facility (DCPF) ............................. 40
5.2.6  Approved processing facility (APF) ............................................. 41
5.2.7  At-risk premises (ARP) ............................................................... 41
5.2.8  Premises of relevance (POR) ....................................................... 41
5.2.9  Resolved premises (RP) ............................................................... 41
5.2.10 Unknown status premises (UP) .................................................. 41
5.2.11 Zero susceptible species premises (ZP) ................................. 42
5.2.12 Qualifiers .................................................................................. 42

5.3  Guidelines for reclassifying previously declared areas .................... 43

6  Quarantine and movement controls ................................................... 45

6.1  General principles .......................................................................... 45

6.2  Guidelines for issuing permits ......................................................... 45

6.3  Types of permits ............................................................................ 46

6.3.1  General permit ........................................................................... 46
6.3.2  Special permit ............................................................................ 46

6.4  Recommended quarantine practices and movement controls ............ 47

6.4.1  Live susceptible animals ............................................................. 47
6.4.2  Semen and embryos from live susceptible animals ..................... 50
6.4.3  Meat and meat products ............................................................. 52
6.4.4  Waste products and effluent ....................................................... 53
6.4.5  Empty livestock transport vehicles and associated equipment ...... 55
6.4.6  People and nonsusceptible animals .......................................... 55
6.4.7  Crops, grains, hay, silage and mixed feeds ................................. 55
6.4.8  Sales, shows and other events ..................................................... 56

7  Procedures for surveillance and proof of freedom ............................. 57
Tables

Table 1.1  AUSVETPLAN documents........................................................................................................7
Table 2.1  Laboratory tests currently available at CSIRO-AAHL for the diagnosis of Aujeszky's disease 21
Table 4.1  Tracing and surveillance........................................................................................................30
Table 6.1  Recommended movement controls for live pigs ....................................................................48
Table 6.2  Recommended movement controls for ruminants ....................................................................50
Table 6.3  Recommended movement controls for pig semen .....................................................................51
Table 6.4  Recommended movement controls for in vivo–derived pig embryos .......................................52
Table 6.5  Recommended movement controls for fresh/frozen pig meat and offal .................................53
Table 6.6  Recommended movement controls for waste products and effluent .......................................54
Table 6.7  Recommended movement controls for empty pig transport vehicles and equipment ...........55

Figures

Figure 2.1  The current approach to diagnostic testing at CSIRO-AAHL ................................................20
1 Introduction

1.1 Scope of this manual

This disease strategy for the management of an outbreak of Aujeszky's disease in Australia is an integral part of the Australian Veterinary Emergency Plan, or AUSVETPLAN (Edition 4). AUSVETPLAN structures and functions are described in the AUSVETPLAN Overview Document (in preparation). The disease strategy provides information about the disease (Section 2); the relevant risk factors and their treatment, and the options for management of a disease outbreak, depending on the circumstances (Section 3); the starting policy and guidelines for agencies and organisations involved in a response to an outbreak (Section 4); declared areas and premises (Section 5); quarantine and movement controls (Section 6); and how to establish proof of freedom (Section 7). The key features of Aujeszky’s disease are described in the Aujeszky's disease [Fact Sheet — under development].

This manual has been produced in accordance with the procedures described in the AUSVETPLAN Overview Document (in preparation), and in consultation with Australian national, state and territory governments; the relevant livestock industries; nongovernment agencies; and public health authorities, where relevant.

In this manual, 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.

1.2 Structure of AUSVETPLAN

Guidelines for the field implementation of AUSVETPLAN are contained in the disease strategies, response policy briefs, operational manuals and management manuals. 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 is shown below. The complete series of manuals is available on the Animal Health Australia website.¹

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<tr>
<th>Document type</th>
<th>Manuals</th>
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<tbody>
<tr>
<td>Overview document</td>
<td>Background information about AUSVETPLAN rationale, development and maintenance</td>
</tr>
<tr>
<td>Disease strategies</td>
<td>Individual disease and policy information for most of the diseases listed in the EADRA</td>
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<tr>
<td>Response policy briefs</td>
<td>Summary disease and policy information for each EADRA disease not covered by individual disease strategies (see above)</td>
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<td>Operational manuals</td>
<td>Decontamination</td>
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<td>Destruction of animals</td>
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<td>Disposal</td>
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<td>Livestock welfare and management</td>
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<td>Valuation and compensation</td>
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<td>Wild animal response</td>
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<td>Artificial breeding centres</td>
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<td>Zoos</td>
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<td>Management manuals</td>
<td>Control centres management (Parts 1 and 2)</td>
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<td>Laboratory preparedness</td>
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<tr>
<td>Outbreak manuals</td>
<td>Collations of individual disease, operational and enterprise information for use in an emergency disease outbreak</td>
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1.3 Nationally agreed standard operating procedures

Nationally agreed standard operating procedures (NASOPs)\(^2\) have been developed for use by jurisdictions during responses to emergency animal disease (EAD) incidents and emergencies. These procedures underpin elements of AUSVETPLAN and describe in detail specific actions undertaken during a response to an incident.

1.4 World Organisation for Animal Health listing

The World Organisation for Animal Health (OIE) includes Aujeszky’s disease on its list of notifiable diseases as a multispecies disease. OIE-listed diseases are diseases with the potential for international spread, significant mortality or morbidity within the susceptible species, and/or zoonotic spread to humans.\(^3\) OIE member countries that have been free from a notifiable disease are obliged to notify the OIE within 24 hours of confirming the presence of the disease.

The strategies in this document for the diagnosis and management of an outbreak of Aujeszky’s disease are based on the recommendations in the OIE Terrestrial Animal Health Code (Chapter 8.2) and the OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals (Chapter 2.1.2). The strategies and policy guidelines are for emergency situations, and are not applicable to quarantine policies for imported livestock or livestock products.

1.5 Australian emergency animal disease listing

In Australia, Aujeszky’s disease is included as a Category 4 emergency animal disease in the Government and Livestock Industry Cost Sharing Deed in Respect of Emergency Animal Disease Responses (EADRA).\(^4\) Category 4 diseases are those for which costs will be shared 20\% by government and 80\% by industry.

1.6 Manner and risk of introduction to Australia

Aujeszky’s disease occurs worldwide, with a prevalence of 5–26\% in infected countries.

The most likely source of infection with Aujeszky’s disease is the head, neck and offal of infected pigs. However, introduction into free countries is generally associated with movements of live animals or infected genetic material rather than the importation of carcase meat (excluding offal and heads).

The most significant risk of entry of Aujeszky’s disease into Australia is through illegal entry — via passengers on ships or aircraft, or via post — of genetic material and infected pig products that are swill-fed to domestic pigs or accessed by feral pigs and rodents. (Swill feeding is illegal in Australia.) There is a risk from garbage discarded by fishing vessels or yachts.


\(^3\) These criteria are described in more detail in Chapter 1.2 of the OIE Terrestrial Animal Health Code (www.oie.int/index.php?id=169&L=0&htmfile=chapitre_criteria_diseases.htm).

\(^4\) Information about the EAD Response Agreement can be found at www.animalhealthaustralia.com.au/what-we-do/emergency-animal-disease/ead-response-agreement/.
Aujeszky's disease has the potential to become established in the feral pig population, especially in remote and rural regions of Australia. Amplification and regional spread could then occur via fomites, live pigs and semen. Small commercial piggeries would be most at risk.

In 2004, Australia released a final Import Risk Analysis report for pigmeat (DAFF 2004). Quarantine requirements to manage the risk of Aujeszky's disease include removing the head and neck from the carcass, deboning and processing (cooking or curing) or canning of pigmeat, and sourcing meat from pigs that have been kept since birth in a country or zone free from Aujeszky's disease. There is no policy for importation into Australia of live pigs, porcine genetic material or offal; hence they are not permitted entry.

1.7 Social and economic effects

Losses to individual producers and to the industry as a whole could be substantial if the disease is allowed to proceed uncontrolled over the long term. The costs could include lost production (piglet mortality) and costs of ongoing control (vaccination). The cost of endemic disease has justified eradication in a number of countries.

There could be spillover effects. Sheep, cattle, cats and dogs are sporadically affected, with fatal results. This could cause social disharmony in Australia where the reputation of veterinary services to eliminate spillovers and to eradicate animal diseases is high.

In terms of eradication costs, loss to individuals with infected herds, particularly if depopulation is undertaken, could be considerable in the short term. Producers of breeding stock will lose sales while premises are under quarantine. However, a well-planned eradication program and the judicious marketing of saleable stock will assist in minimising this loss while still achieving eradication.

Although Australia has a relatively small export market for pigmeat and live pigs, an outbreak of Aujeszky's disease could seriously affect that market. The OIE Terrestrial Code does not recommend that any restrictions be placed on pigmeat for Aujeszky's disease or that a prohibition be placed on the importation of live pigs from Aujeszky's disease–infected countries, but Australia would need to be able to provide sound evidence of free herds through adequate serological surveillance.
2  Nature of the disease

Aujeszky’s disease is a viral disease primarily of domestic pigs and occasionally of wild animals. It affects the nervous, respiratory and reproductive systems. It is of greatest economic importance in pigs.

2.1  Aetiology and pathogenicity

Aujeszky’s disease is caused by porcine alphaherpesvirus type 1 of the family *Herpesviridae*. There is only one serotype, but strains vary with respect to virulence (from mild to severe), minimum infective dose and tissue tropism.

2.2  Susceptible species

The pig is the only natural host for Aujeszky’s disease virus. Sporadic cases occur in horses, cattle, sheep, goats, dogs, cats, mink, foxes, deer, rabbits, mice and rats. The disease is invariably fatal in these other species.

There have been no substantiated reports of human infection.

2.3  World distribution and occurrence in Australia

2.3.1  World distribution

Aujeszky’s disease occurs in most countries of Europe and Asia, in parts of the United States (feral pigs only), and in Central and South America. The prevalence in infected countries is 5–26%.

Canada, Denmark, Norway, Finland and Luxembourg are free from the disease, and the United Kingdom eradicated it during the 1980s. New Zealand declared itself free from Aujeszky’s disease in 2000, following an eradication campaign in the 1990s.

For the latest information on the distribution of Aujeszky’s disease, refer to the World Organisation for Animal Health (OIE) World Animal Health Information Database.\(^5\)

2.3.2  Occurrence in Australia

Aujeszky’s disease has never been diagnosed in Australia.

\(^5\)  http://web.oie.int/wahis/public.php?page=home
2.4 Epidemiology

Aujeszky's disease is contagious in pigs and is mainly spread by the respiratory route. Spread from farm to farm can be expected to be slow, but within-farm spread will be relatively rapid.

2.4.1 Incubation period

The incubation period can be as short as 2–4 days in sucking pigs and 3–6 days in finishers. Excretion of virus begins 2–5 days after infection and can continue for at least 14 days. It may precede the onset of clinical signs (Pensaert and Kluge 1989).

OIE incubation period


2.4.2 Persistence of agent and modes of transmission

General properties

Aujeszky's disease virus is a large virus with a lipid envelope, which is sensitive to many disinfectants, including detergents.

Environment (including windborne spread)

Aujeszky's disease virus is relatively thermostable compared with other herpesviruses. It has a half-life of 7 hours at 37 °C and the following survival characteristics (Pensaert and Kluge 1989):

- rapidly inactivated at 37 °C in sunlight and in dry conditions
- fairly stable infectivity at pH 5–9, but extreme acidity and alkalinity have a rapid inactivating effect
- survives for extended periods under winter conditions (below 4 °C)
- survives in contaminated straw and feeding troughs for 10–30 days at 24 °C or for up to 46 days at −20 °C; and on other fomites for 2–7 days at 25 °C (Schoenbaum et al 1991)
- survives in effluent for up to 3 days
- survives in well water and green pasture for up to 7 days (Kluge et al 1999).

Under certain favourable conditions in densely populated pig-farming areas, windborne spread of the virus from farm to farm can occur over distances of more than 2 km (Gloster et al 1984). The disease spread from northern Germany to Denmark in the air over a distance of 15–40 km and, in one case, 80 km (Christensen et al 1990). Windborne spread over substantial distances (up to 80 km) can be modelled and the distribution predicted (Christensen et al 1990).
The specific prerequisites for windborne spread are:

- large amounts of virus (ie large herds infected)
- the correct strain of virus
- appropriate environmental conditions (ie low temperature and high humidity)
- topography suitable for windborne spread
- the close proximity of other pig herds (Pejsak and Truszczynski 2006).

It is highly unlikely that these favourable conditions would be met in Australia.

**Susceptible animals**

**Live domestic animals**

The most important method of infection is via oral and nasal secretions. Aujeszky's disease virus is spread principally by nose-to-nose contact. Other methods of spread are via:

- semen or vaginal secretions (see below)
- transplacental infection
- the colostrum or in milk.

In general, pigs excrete virus oronasally during the 2–4-week period following the primary infection. Longer persistence with continuous excretion has been reported (6 months in one United States study) but is probably rare (Pensaert and Kluge 1989). However, a very high percentage of pigs become latent carriers for one year or longer, with intermittent virus excretion at times when the animal is stressed, such as at parturition. There is circumstantial evidence that some latently infected pigs may be undetected by conventional serological tests (Pejsak and Truszczynski 2006).

Most outbreaks originate from the introduction of infected pigs to susceptible herds.

**Live wild (including feral) animals**

Feral pigs can be infected by Aujeszky’s disease virus, and it is therefore necessary to minimise contact between feral pigs and infected domestic pigs. Feral pigs in the area should be controlled and destroyed if possible, and should be included in surveillance programs to help define the extent of any infection in the feral pig population. In the southeast of the United States, 19% of feral pigs are seropositive (van der Leek and Gibbs 1992).

Aujeszky's disease virus is less resistant in the environment than other porcine viruses, and there is no evidence of vector involvement in its maintenance. Both these factors may decrease the likelihood of Aujeszky’s disease spread in feral pigs when the feral pigs occur at low density.

Transmission to other susceptible species, including cats, rats and mice, occurs via consumption of head or offal tissue. Very rarely has Aujeszky’s disease virus been detected in muscle tissue. Animals other than pigs are generally regarded as ‘dead-end’ hosts, as infection in these animals is usually short and self-limiting. Most die after an illness of short duration, usually 2–3 days after the appearance of clinical signs.

Rats and wildlife may have some role as reservoirs, but this requires further study.

The virus has been spread from animals (eg cats and rodents) that have died from the disease and contaminated grain bins (Kluge et al 1999).
Animal products

Meat and meat products

Aujeszky's disease virus can survive in offal (head and neck tissues, and thoracic and abdominal viscera); the survival time depends on the temperature at which the material is held (Pensaert and Kluge 1989). For example, offal would need to be treated to at least 62 °C to inactivate the virus (Turner et al 2000).

Pigs are viraemic for only a short time, and the viability of the virus in meat is reduced by the pH changes after death. Virus was recovered from the carcass muscle of clinically affected pigs after storage at 1–2 °C for 72 hours (MacDiarmid 1991), but was inactivated in muscle, lymph node and bone marrow from an artificially infected hindquarter after 35 days at -18 °C (Durham et al 1980).

Although it can be isolated from the tissues of infected pigs after death (Heard 1980, Pensaert and Kluge 1989), Aujeszky's disease virus is not considered a high-risk contaminant of pigmeat products. It does not appear in the OIE review by Farez and Morley (1997) of 'potential animal health hazards of pork and pork products'. DAFF (2004) has reviewed the literature on infectivity of Aujeszky's disease virus in pigmeat, citing papers that report detection of very low virus titres in the muscle of experimentally infected pigs and the transmission of infection through the consumption of carcasses of infected animals. Offal (head and neck tissues, and thoracic and abdominal viscera) presents a higher risk of disease transmission than meat.

The dose of virus necessary to infect pigs orally is much greater than the dose required for infection via the respiratory route (Wittmann and Rziha 1989).

Semen and embryos from live susceptible animals

Acutely infected boars can transmit virus through semen, and it would be expected that carriers would also intermittently excrete the virus in semen. Acutely and chronically infected sows can be expected to excrete the virus into the reproductive tract and have been shown to infect naive boars.

Although Aujeszky's disease virus has been reported to be capable of infecting embryos (Bolin et al 1982), embryo transfer has been successfully used to derive Aujeszky's disease virus-negative embryos from infected sows (James et al 1983).

For embryos derived in vivo, the International Embryo Transfer Society (IETS) lists Aujeszky's disease in Category 1. This means that sufficient evidence has accrued to show that the risk of transmission is negligible provided that the embryos are properly handled between collection and transfer (according to the IETS Manual). The IETS notes that trypsin treatment is required during embryo processing to ensure the removal of any residual Aujeszky's disease virus.

See also the Artificial Breeding Centres Enterprise Manual.

People and nonsusceptible animals

Humans are not carriers of Aujeszky's disease and have not been implicated in the spread of the disease other than by the use of contaminated equipment, such as hypodermic needles and syringes contaminated with blood from infected animals.

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6 Manual of the International Embryo Transfer Society, IETS, Savoy, IL, USA [www.iets.org/pubs_educational.asp]
Vehicles, including empty livestock transport vehicles

Vehicular spread of the virus has not been documented.

Equipment, including personal items

The virus may survive on veterinary instruments, and spread via veterinary instruments within and between herds has been reported (Kluge et al 1999).

Vectors

Aujeszky’s disease virus has no insect vectors. There are no reliable reports that the virus survives in or on birds, in biting insects or on flies beyond 24 hours, or that it is mechanically transmitted by them.

2.4.3 Factors influencing transmission

The emergence of Aujeszky’s disease as a significant disease in many countries coincided with intensification of pig farming practices. The increased density of both animals and farms probably contributed to the spread of the disease over substantial distances as the result of the movement of breeding stock. A high percentage of pigs become latent carriers for a year or longer (see Section 2.4.2). Movement or importation of live animals can therefore be an important means of introduction of the disease to a new area.

Aujeszky’s disease has been eliminated from herds in Denmark, England, New Zealand and the United States by a combination of measures, including movement controls, vaccination, testing and slaughter. For example, Aujeszky’s disease has been successfully eliminated from infected farms by either:

- immediate depopulation (with salvage through an abattoir) where acute cases of disease are present and/or when more than 25% of the breeding herd is serologically positive; or
- progressive depopulation over a 7-month period to minimise the slaughter of pigs of unsaleable weight; or
- removal of serological reactors when these comprise less than 20–25% of the breeding herd.

In Denmark, infected herds with fewer than 25% reactors were tested every 28 days. Seropositive sows were removed after each test until there were two clear tests followed by a clear test 6 months later. The United Kingdom eradicated Aujeszky’s disease by slaughtering either infected herds, or only seropositive pigs in herds with low prevalence and no evidence of spread of infection.

In New Zealand, most infected herds (50%) were depopulated or a test-and-removal program was used (30% of herds). Vaccination, test and removal were used in 15% of herds.

2.5 Diagnostic criteria

Since the clinical signs of Aujeszky's disease are not pathognomonic, presumptive diagnosis may be based initially on histopathology (ie nonsuppurative encephalomyelitis) and confirmed by positive serology, or virus or antigen detection in tissue or serum.

Aujeszky’s disease may be diagnosed first in other species that are in close contact with pigs (eg cats, dogs or rodents), when sudden deaths with or without itching (pruritus) occur.
2.5.1 Case definition

For the purposes of this manual, the case definition for Aujeszky's disease is clinical signs in susceptible species, accompanied by a confirmed laboratory diagnosis (for the first case), or clinical signs in susceptible species after an outbreak has been confirmed.

2.5.2 Clinical signs

Animals

Pigs

Clinical signs in pigs are dependent on the strain and dose of virus, and the age of pigs infected. The most severe disease occurs in young animals, and infection of adult pigs is often mild or inapparent. The first signs of infection in a herd may be reproductive failure (abortions, mummified fetuses and stillbirths), followed shortly after by disease in neonates.

In newly infected herds, the virus usually spreads rapidly through the whole herd. Clinical signs are most likely to be seen in newborn pigs and breeding sows. The disease mainly affects the respiratory and nervous systems, but respiratory signs were never a feature of Aujeszky's disease in the North Island of New Zealand, where the disease was manifest as a fatal neurological disorder of piglets, or as a reproductive disease in pregnant sows (Pannett et al 1999). Manifestation of clinical signs can vary considerably according to the age of the pig; nervous signs are more commonly seen in younger pigs, whereas respiratory signs are usually observed in older animals. Itching is rarely seen as a clinical sign in pigs.

Clinical signs in pigs of different ages are as follows:

- Newborn. For piglets less than 2 weeks old, the case mortality rate may approach 100%, and death occurs within hours of the onset of clinical signs. Prostration is often the only clinical sign. Slightly older piglets show fever and variable signs of loss of appetite, vomiting and depression, with central nervous system (CNS) and respiratory involvement. The CNS signs consist of incoordination, abnormal 'goose-stepping' gait, drowsiness, muscular twitching, convulsions, involuntary eye movements and paralysis. The case mortality rate ranges from 20% to 100%. Deaths occur up to 1 week after the onset of signs but may be seen as early as 24 hours after the onset of clinical disease.

- Weaner pigs. The case mortality rate for weaner pigs is generally of the order of 5–10%. The clinical signs already described may be present, but respiratory signs are usually more prominent. These include coughing, sneezing, laboured breathing and conjunctivitis.

- Grower and finisher pigs. Respiratory disease is the most common clinical sign and may be mild but rapidly spreading. Morbidity rates may be very high and approach 100%, but if the infection is uncomplicated, case mortality rates are low (1–2%).

- Adults. Although infection of adult pigs is often mild or inapparent, severe outbreaks have been reported. The virus can cross the placenta. If sows are infected earlier than the 13th day of pregnancy, there is likely to be embryonic resorption. At later stages of pregnancy, there may be abortion, mummified fetuses, stillbirths or the birth of weak, trembling pigs. Retrospective analysis of herd records to detect changes in farrowing rates, or numbers weaned per litter and numbers sold per sow per year, may give an indication of the time of infection. In New Zealand (MacDiarmid 1992), Singapore and the United Kingdom, the clinical signs were, for many years, unremarkable, as pigs may seroconvert without any clinical signs if infected by very low doses of the virus. A retrospective serological survey in New Zealand after the first Aujeszky's disease
diagnosis indicated that the virus had been present for at least 3 years without causing recognisable clinical disease (Oliver 1989).

Cattle and sheep

The disease is almost invariably fatal in these species. The most striking clinical feature is intense itching of a localised area or areas of skin, innervated by one or more spinal nerves. This leads to licking, rubbing or gnawing so severe as to lead to self-mutilation. After a day or so, the animal is prostrate but is still capable of rising and walking unsteadily. The animal becomes progressively weaker over the next 12–24 hours and develops rhythmic convulsions, bellowing, grinding of the teeth, pharyngeal paralysis, rapid shallow breathing and cardiac irregularities. Consciousness is maintained until near death, which usually occurs about 2 days after the onset of signs.

Dogs and cats

The clinical signs are similar to those in ruminants. There is intense itching and self-mutilation. The animal may emit plaintive whimperings and howls. Paralysis of the pharynx and profuse salivation may simulate rabies; hence the alternative name, pseudorabies. There may be rhythmic convulsions. Death occurs within 24–48 hours in dogs and often more rapidly in cats. In Singapore, diagnosis of Aujeszky’s disease was often preceded by deaths of cats in piggeries. (Note that Singapore no longer has pig farms.) Several fatal cases of nervous disease in dogs were reported in New Zealand.

Rodents

Rats and mice are dead-end hosts because these species do not transmit the virus. On farms where the disease is present, increased numbers of dead rodents are frequently evident.

2.5.3 Pathology

Gross lesions

At postmortem examination in pigs, gross lesions are often minimal or absent. There may be purulent inflammation of the nasal lining, pharyngitis, tonsillitis and areas of fluid retention, congestion or consolidation in the lungs. In the CNS, the meninges may be congested. Lymph nodes may be mildly congested and contain some tiny, flat, red or purple haemorrhages. Occasionally, there are small white–yellow necrotic foci in the liver and spleen of affected animals or aborted fetuses.

In all species other than pigs, the predominant and sometimes the only nervous system lesions are found in the spinal cord. Lesions consist of oedema, congestion and haemorrhage. These lesions are most severe in the section of the dorsal horn and dorsal root ganglia that innervate the area of skin affected by itching. CNS lesions are similar to those in pigs, but are much milder.

Microscopic lesions (histopathology)

In affected animals, there is a diffuse, nonsuppurative (not involving neutrophils) inflammation of the brain, spinal cord and spinal nerves. Brain lesions are most common in the cerebral and cerebellar cortices, but they also occur in the pons, thalamus and medulla. Grey and white matter are both affected. There is marked perivascular cuffing (white cell accumulation), glial cell proliferation, and varying degrees of nerve cell necrosis. Cowdry type A intranuclear inclusion bodies occur in glial cells, but are by no means plentiful. There are areas of meningitis, particularly adjacent to lesions. In the lungs, there may be oedema and interstitial pneumonia. Necrotic foci may be present in the tonsils,
liver, kidneys, spleen and associated lymph nodes. There is nerve cell degeneration and moderate cellular infiltration.

2.5.4 **Differential diagnosis**

The following diseases and conditions should be considered in a differential diagnosis of Aujeszky’s disease:

- classical and African swine fever
- porcine reproductive and respiratory syndrome
- enterovirus encephalomyelitis (highly virulent strain)
- swine influenza
- Nipah virus disease
- streptococcal meningoencephalitis
- hypoglycaemia
- haemagglutinating encephalomyelitis virus
- encephalomyocarditis
- organic arsenic and mercury poisoning
- salt poisoning
- other respiratory diseases (actinobacillosis, enzootic pneumonia and pasteurellosis, streptococcosis)
- enterovirus encephalomyelitis (milder strains)
- other diseases causing stillbirths and/or abortions (eg parvovirus disease, leptospirosis)
- porcine myocarditis syndrome
- congenital tremors
- rabies (cats and dogs)
- scrapie (sheep and goats)
- bovine spongiform encephalopathy (cattle)
- any other conditions causing signs of persistent itching.

2.5.5 **Laboratory tests**

**Samples required**

**Fresh specimens**

Specimens required for detection and characterisation of the agent, serological testing and histopathology are as follows:

- identification of agent
  - fresh tissues (2 g of each tissue) collected aseptically postmortem and forwarded unpreserved: spleen, tonsils, lymph nodes and distal ileum; lung, kidney and liver may be included principally for differential diagnostic workup
- serological testing
  - sera from animals suspected of having chronic disease (30 samples)
  - sera from sows suspected to have had piglets with chronic disease
• histopathology
  - a full range of tissues (including the brain and spinal cord) in neutral-buffered formalin.

From all species, one half of the brain should be collected aseptically after longitudinal section. From all species except pigs, the skin and subcutaneous tissue at the site of itching should also be collected. From pigs, samples of lung, spleen, pharyngeal mucosa and tonsil should also be collected aseptically. From live pigs, nasal swabs should be collected and submitted in virus transport medium.

Heparinised blood and blood samples for serum (about 10 mL) should be collected from convalescent and recovered animals. Serum antibodies are detected 7–10 days after infection.

**Preserved specimens**

The other half of the brain, together with cervical, thoracic and lumbar segments of the spinal cord, should be fixed in neutral-buffered formalin. Specimens of tonsil, mesenteric lymph nodes, spleen, liver and kidney should also be collected in neutral-buffered formalin. If circumstances permit, a whole pig should be submitted to the laboratory.

**Transport of specimens**

Specimens should be forwarded to the CSIRO Australian Animal Health Laboratory (CSIRO-AAHL), Geelong, for emergency disease testing, after the necessary clearance has been obtained from the chief veterinary officer (CVO) of the state or territory of the suspect case, and after the CVOs of Victoria and Australia have been informed about the case and the transport of the specimens to Geelong. Sample packaging and consignment for delivery to CSIRO-AAHL should be coordinated by the relevant state or territory laboratory.

For some diseases (bluetongue, Hendra virus infection, influenza (any species), Newcastle disease), the state or territory diagnostic laboratory may conduct initial screening under the Laboratories for Emergency Animal Disease Diagnosis and Response (LEADDR) program. LEADDR is a coordinated laboratory network that provides a collaborative program of test harmonisation and quality assurance. Specimens will be forwarded to CSIRO-AAHL for confirmation of non-negative results, and for further testing and characterisation.

For further information, see the Laboratory Preparedness Manual.

**Packing specimens for transport**

Unpreserved tissue specimens should be chilled and forwarded on ice or frozen gel packs. However, if transit is likely to take more than 24 hours, glycerol buffer (pH 7.4) should be added to the specimens. Alternatively, the specimens may be frozen and forwarded on dry ice. If they are sent on dry ice, the containers used should be gas tight because carbon dioxide will acidify the samples.

**Laboratory diagnosis**

Diagnosis is based on the direct detection of antigen or viral DNA in tissues, virus isolation in tissue culture and/or the measurement of antibodies in serum. Immunoperoxidase tests on formalin-fixed tissue are also available and very effective in detecting Aujeszky’s disease virus; they are particularly useful as a retrospective diagnostic test.

Virus neutralisation and enzyme-linked immunosorbent assay (ELISA) tests are used to detect antibody in serum. Commercially available ELISA tests are highly sensitive and useful in the initial
screening of sera (Pejsak and Truszczyński 2006), although they are not as specific as virus neutralisation, which would be used to confirm positive ELISA results. ELISA tests, using blood samples collected on paper discs, were successfully used by New Zealand in its eradication program. This technique was as sensitive as testing serum samples and led to significant cost savings.

Detection of viral DNA by quantitative real-time polymerase chain reaction (PCR) is the preferred screening method for agent detection. This assay is highly sensitive, gives rapid results and can be scaled up to high-volume testing. Testing is on fresh tissues; tonsil, pharyngeal mucosa, brain stem and cerebrum are preferred. Viral antigen can also be detected in tissues from affected pigs — this might be more sensitive than virus isolation for tissues collected some time previously. Virus can also be isolated from the trigeminal ganglia of latently infected pigs by tissue culture co-cultivation, following detection of viral genome using PCR techniques.

If vaccination is used in an eradication program, antibody caused by natural infection can be discriminated from antibody caused by vaccination using gene deletion vaccines and their companion ELISA kits. The kits detect antibody to the protein encoded by the deleted gene. Such kits were used successfully in New Zealand (Motha et al 1997) in problem herds where vaccination was used.

**CSIRO-AAHL tests**

The testing method used by CSIRO-AAHL is shown in Figure 2.1. Further details of tests currently available at CSIRO-AAHL are shown in Table 2.1.
Figure 2.1  The current approach to diagnostic testing at CSIRO-AAHL
Table 2.1  Laboratory tests currently available at CSIRO-AAHL for the diagnosis of Aujeszky’s disease

<table>
<thead>
<tr>
<th>Test</th>
<th>Specimen required</th>
<th>Test detects</th>
<th>Time taken to obtain result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agent detection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>qPCR</td>
<td>Fresh tissue</td>
<td>Viral DNA</td>
<td>4–5 hours</td>
</tr>
<tr>
<td>Agent characterisation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virus isolation and identification</td>
<td>Fresh tissue</td>
<td>Virus</td>
<td>3–6 days</td>
</tr>
<tr>
<td>PCR and sequencing</td>
<td>Fresh tissue, whole EDTA blood or virus isolate</td>
<td>Viral DNA</td>
<td>2–3 days</td>
</tr>
<tr>
<td>Serology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virus neutralisation test</td>
<td>Serum</td>
<td>Antibody</td>
<td>4–5 days</td>
</tr>
</tbody>
</table>

EDTA = ethylenediaminetetraacetic acid; PCR = polymerase chain reaction; qPCR = quantitative real-time polymerase chain reaction Source: Information provided by CSIRO-AAHL, 2011 (refer to CSIRO-AAHL for the most up-to-date information)

2.6  Resistance and immunity

2.6.1  Innate immunity

Immunity is age related. Piglets sucking immune sows are protected by colostral immunity for about 6–8 weeks, depending on the level of sow immunity. Maternally derived antibody can persist for up to 4 months.

2.6.2  Acquired immunity

Pigs that have recovered from infection are immune to further exposure. During periods of stress, recovered asymptomatic pigs may excrete virus.

2.7  Vaccination and/or treatment of infected animals

Vaccines based on attenuated virus, inactivated virus and gene-deleted virus have been developed. Attenuated (‘live’) vaccines are considered to be more effective than inactivated or killed vaccines (Vannier et al 1991). Vaccines effectively protect pigs against clinical disease and significantly reduce the quantity and duration of viral shedding, but do not prevent latent infections. Transmission of Aujeszky’s disease virus may occur from latently infected, vaccinated pigs within a herd. A disadvantage with inactivated or attenuated vaccines is that the serological response following their use is indistinguishable from that following natural infection.

Gene-deleted vaccines, sometimes referred to as marker vaccines, have been genetically engineered to remove some non-essential glycoprotein genes. The absence of these surface proteins (eg gG, gE,
gC) in gene-deleted vaccines gives them an advantage over conventional whole virus vaccines in that it is possible to distinguish noninfected vaccinated animals from those with field infection. There remains a concern that the recombination of gene-deleted vaccines might lead to a virulent virus if an animal is vaccinated with two different sorts of vaccines. However, extensive field use of gene-deleted vaccines during Aujeszky’s disease outbreaks has not resulted in recombination.

A glycoprotein I (gE) deleted vaccine (Geskypur) was successfully used in the New Zealand eradication program (Motha et al 1997).

Treatment of infected animals is inappropriate and ineffective.
3 Principles of control and eradication

3.1 Critical factors for formulating response policy

3.1.1 Features of the disease

- Pigs are the only natural hosts, but the disease may also be seen in ruminants, and in dogs, cats and rodents.
- Clinical signs in pigs are dependent on the strain and dose of virus, and the age of the pig; the most severe disease occurs in young animals, and infection of adult pigs is often mild or inapparent.
- The clinical signs of Aujeszky’s disease are not pathognomonic and may be inapparent, and the disease may lie undetected for a considerable time before a diagnosis is made.
- In infected herds, the proportion of infected pigs will depend on a range of factors and may vary between 10% and 90%.
- In newly infected herds, Aujeszky’s disease virus will spread rapidly to all pigs in the herd, but the virus is likely to spread slowly between herds, because direct contact between pigs (via oral and nasal secretions) would be the principal method of transmission in Australia.
- Pigs that have recovered from infection are immune to further exposure; during periods of stress, recovered asymptomatic pigs may excrete virus.
- Good differential diagnostic tests enable early detection of infected pigs.
- Offal (head and neck tissues, and thoracic and abdominal viscera) presents a higher risk of disease transmission than meat.
- The spread of disease into feral pig herds is less likely than with other exotic pig diseases as Australian conditions are not conducive to windborne spread of the virus.
- Vaccines effectively protect pigs against clinical disease and significantly reduce the quantity and duration of viral shedding, but do not prevent latent infections.
- If gene-deleted vaccines are used, it is possible to differentiate between infected and vaccinated pigs.

3.1.2 Features of susceptible populations

- The first infected premises identified may not be the index case.
- Clinical signs in ruminants may not be readily identified as Aujeszky’s disease.
- Market fluctuations due to public health perceptions or product withdrawals would reduce the value of the industry.
- With infection in extremely large piggeries, it may be impractical to invoke immediate stamping out by destruction of all infected and exposed pigs; the response may need to be tailored to the type, size and location of affected piggeries.
- Intensive production systems are prone to rapid overcrowding if output is disrupted, with resultant animal welfare issues.
- The most likely method of entry of Aujeszky’s disease to Australia is via illegal movements of infected pigs in the remote north, or the illegal importation of genetic material or offal.
- Movement controls will prevent spread from herd to herd, especially if agreed industry biosecurity protocols are followed after the initial diagnosis.
- Feral pig and smallholder pig populations are not easily identified.
Animals owned by such smallholders are more likely than those owned by commercial livestock producers to be exposed to emergency animal diseases, due to their locations, biosecurity practices, relative lack of quality assurance programs, and so on (Perkins et al 2010).

Overall, most of the risk of emergency animal disease outbreaks is associated with commercial livestock producers, rather than smallholders, because of their far greater numbers of animals and animal movements (Perkins et al 2010).

Fear of repercussions may deter smallholders from reporting disease.

3.2 Options for control and eradication based on the critical factors

Based on the assessed critical factors, managing an outbreak of Aujeszky’s disease may require the use of some or all of the following options:

- registering all commercial and small pig holdings (or another method of assuring the location of domestic pigs, particularly those in smallholdings)
- application of mandatory biosecurity programs
- heightened prevention and assurance activities for swill feeding
- early determination of the extent of infection through the rapid identification of infected and potentially infected premises (including piggeries, saleyards, meatworks and cold stores), using quickly instituted serosurveillance and animal tracing, based on an epidemiological assessment
- swift declaration and effective policing of control areas, and rapid imposition of quarantine and movement controls on infected and potentially infected premises, to prevent the movement of pigs, pig products and waste carrying virus or potentially carrying virus
- minimising the exposure of susceptible pigs by preventing direct and indirect contact of at-risk pigs with infected pigs and potentially contaminated pig products and waste
- elimination of infection from infected premises and/or infected pig populations by the rapid destruction of pigs, and the sanitary disposal of carcasses and waste, and decontamination
- implementation of appropriate zones and compartments
- the recall of pig meat and offal originating from infected domestic pig premises, and game meat and offal sourced from possibly infected feral pig populations
- use of vaccination with movement controls — DIVA (differentiating infected from vaccinated animals) may need to be employed to distinguish infected from vaccinated pigs
- gaining of smallholder support
- management of feral pig populations.

The policy options for control or eradication of Aujeszky’s disease are:

- **stamping out** — the prompt destruction and sanitary disposal of pigs infected with or exposed to Aujeszky’s disease virus
- **modified stamping out** — allowing pigs to be slaughtered (for human consumption), perhaps using vaccination
- **long-term control** — recognition of endemic status, using compartmentalisation, vaccination and increased biosecurity in the commercial pig industry.

The policy to be implemented is described in Section 4.
4 Policy and rationale

4.1 Introduction

Aujeszky’s disease is a World Organisation for Animal Health (OIE)-listed disease that has significant production effects and is important in the trade of pigs and pig products.

4.1.1 Summary of policy

The response policy with regard to an outbreak of Aujeszky’s disease will be determined by how early the outbreak is detected, the extent of the outbreak, the location of affected premises, the prevalence and severity of clinical signs within infected premises, and whether feral pigs are involved.

The default policy is to control and eradicate the disease in the shortest possible time using stamping out, supported by a combination of strategies, including:

- early recognition and laboratory confirmation of cases
- quarantine and movement controls over pigs and pig products (including offal) in declared areas, to minimise spread of infection
- tracing and surveillance (based on epidemiological assessment) to determine the source and extent of infection (including, as necessary, in feral pigs), and subsequently to provide proof of freedom from the disease
- disposal of destroyed pigs and decontamination of premises
- treatment or destruction and disposal of pig products likely to be contaminated, to reduce the source of infection
- decontamination of fomites (facilities, equipment and other items) to eliminate the pathogen
- welfare management to handle overcrowding of affected piggeries
- use of abattoirs and rendering plants for destruction and disposal, where possible
- recall of suspect pig products
- zoning/compartmentalisation to define infected and disease-free areas and premises
- industry support to increase understanding of the issues, to facilitate cooperation and to address animal welfare issues
- a public awareness campaign.

The default policy will apply if Aujeszky’s disease is not known to be widespread, the infected/suspect population is discrete and able to be controlled, and the destruction and disposal of infected herds are manageable.

A modified stamping-out policy will apply if circumstances allow the safe slaughter (for human consumption) of pigs and processing capacity is available at approved abattoirs. Vaccination may be used in certain circumstances — for example, to reduce the level of virus in certain populations and to protect genetically valuable herds. This policy will be supported by similar strategies to those listed above.

If Aujeszky’s disease is considered to be widespread when diagnosed, or continues to spread despite the application of stamping out or modified stamping out, and is considered not to be eradicable (if, for example, it is found in feral pigs), the policy for long-term control of the...
disease will be determined following consultation between the government and the pig industry. The policy adopted may involve vaccination, increased biosecurity and long-term compartmentalisation.

4.1.2 Case definition

For the purposes of this manual, the case definition for Aujeszky’s disease is clinical signs in susceptible species, accompanied by a confirmed laboratory diagnosis (for the first case), or clinical signs in susceptible species after an outbreak has been confirmed.

4.1.3 Cost-sharing arrangement

In Australia, Aujeszky’s disease is included as a Category 4 emergency animal disease in the Government and Livestock Industry Cost Sharing Deed in Respect of Emergency Animal Disease Responses (EADRA). Category 4 diseases are those for which costs will be shared 20% by government and 80% by industry.

4.1.4 Criteria for proof of freedom

After an outbreak, it will be desirable to prove freedom to Australia’s trading partners in order to maintain or re-establish access to export markets.

Re-establishment of freedom will require a well-planned and documented serosurveillance program of piggeries within a 10-km radius of the previously infected premises. The survey should only be implemented after at least 6 months has elapsed since the pivotal property was determined free from Aujeszky’s disease.

A survey outside this area may also be necessary to substantiate claims for country-free status.

See Section 7 for further details on proof of freedom.

4.1.5 Governance

Chief veterinary officer

The chief veterinary officer (CVO) in the state or territory in which the outbreak occurs and, where relevant (for zoonotic diseases), the chief medical officer (CMO) are responsible for instituting control action within the state or territory. Where the jurisdiction plans to seek cost sharing of the response under the Emergency Animal Disease Response Agreement (EADRA), the CVO is also responsible for recommending an Emergency Animal Disease Response Plan (EADRP) for the particular outbreak to the Consultative Committee on Emergency Animal Diseases (CCEAD).

For cost-shared responses, CVOs will implement disease control measures as agreed in the EADRP and in accordance with relevant legislation. They will make ongoing decisions on follow-up disease

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7 Information about the EAD Response Agreement can be found at www.animalhealthaustralia.com.au/what-we-do/emergency-animal-disease/ead-response-agreement/.
control measures in consultation with the CCEAD and, where applicable, the National Management Group (NMG), based on epidemiological information about the outbreak.

Unaffected jurisdictions may also need to develop response plans to address jurisdictional activities that are eligible for cost sharing. Overall operational management of the incident rests with the CVO of the affected jurisdiction, with oversight by the CCEAD.

**Consultative Committee on Emergency Animal Diseases**

For diseases covered by the EADRA, the CCEAD, convened for the incident, has specific responsibilities (as per Schedule 8 of the EADRA), as follows:

- Receive formal notifications from governments on suspected emergency animal disease (EAD) incidents.
- Advise the NMG if an EADRP is required.
- Recommend to the NMG an EADRP.
- Consider regular reports on progress of an EAD response and develop a consensus on further actions required.
- Provide regular consolidated reports to the affected governments and industries, and to the NMG, on the status of an EAD response.
- In circumstances where rapid eradication of an EAD is judged no longer feasible, provide advice and recommendations to the NMG on when the EAD response should be terminated, when cost sharing should no longer apply, and options for alternative arrangements.
- Determine when a disease has been controlled or eradicated under an EADRP.
- Recommend when proof of freedom has been achieved following the successful implementation of an EADRP.

The CCEAD reports to the NMG when appropriate.

**National Management Group**

If convened for the specific incident, the NMG decides on whether cost sharing will be invoked (following advice from the CCEAD) (see Section 4.5) and approves the EADRP. It also has responsibility for authorising an order for vaccine (if relevant), on advice from the CCEAD. Also refer to Schedule 8 of the EADRA.

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

For information on the responsibilities of the state coordination centre and local control centre, see the **Control Centres Management Manual (Parts 1 and 2)**.

### 4.2 Public health implications

Aujeszky’s disease has no public health implications.

### 4.3 Control and eradication policy

Following the initial diagnosis of Aujeszky’s disease and the identification of an infected premises (IP), the priorities are firstly to implement quarantine and movement controls and then to determine the
extent of the outbreak — the size and number of infected herds and disease prevalence within herds — through tracing and surveillance.

Different control and eradication options are applicable, depending on the type and magnitude of the risks that need to be managed. These will be influenced by how early an outbreak is detected, the extent to which the disease has spread when initially diagnosed, the virulence of the virus, the location of affected premises, the prevalence of infection within IPs, and whether feral pigs are involved.

The default policy, to control and then eradicate the disease through stamping out, will apply if Aujeszky’s disease is not known to be widespread, the infected and suspect population is discrete and able to be controlled, and the destruction and disposal of infected herds is manageable.

A modified stamping-out policy (see Section 3.3) will apply if circumstances allow the safe slaughter of pigs (including seropositive animals not showing clinical signs) for human consumption, provided that processing capacity is available at approved abattoirs.

Vaccination may be used in certain circumstances — for example, to reduce the level of virus in certain populations and to protect genetically valuable herds.

Provided that quarantine and movement controls are promptly implemented on IPs, the disease will be able to be contained while the tracing and surveillance program is implemented, which may take some weeks.

4.3.1 Stamping out

Stamping out may be considered if tracing and surveillance show that the disease is limited and confined, and/or there is a high prevalence in the breeding herd, such that systematic eradication is likely to be prolonged and costly to individual producers and a major disruption to commercial operations.

Stamping out will be undertaken on all IPs and dangerous contact premises (DCPs) through the rapid destruction of pigs. On DCPs, it may involve all pigs or only selected pigs, depending on the size of the pig holding, the level of contact and the risk of spread of disease.

On IPs, all pigs will be destroyed. On DCPs, the following will be destroyed (as a minimum):

- pigs originating from an IP
- pigs having access to the faeces, urine and/or secretions of pigs moved from an IP.

All pigs on smallholdings (IPs and DCPs) will be destroyed.

All pig products (meat and offal) on IPs will be destroyed, and pig products originating from IPs will be recalled and destroyed. Product on DCPs and suspect premises (SPs) may be destroyed, or may be retained for an agreed period of time (depending on the agreed incubation period) and released for further heat processing following negative results from monitoring. Game products (meat and offal) from possibly infected feral pig populations may need to be recalled and destroyed, depending on the known extent of infection.

Efficient and humane procedures will be employed to kill pigs, without moving them from the site (see the Destruction of Animals Manual). Welfare considerations will be taken into account in setting priorities for destruction.

There is no requirement for sentinel animals. After depopulation, restocking with animals from disease-free herds may begin after decontamination is complete. The breeding herd should be monitored serologically 30 days after restocking.
4.3.2 Quarantine and movement controls

See Section 6 for details on declared premises and areas, and recommended quarantine and movement controls.

**Quarantine**

Quarantine will be immediately imposed on all premises and areas on which infection is either known or suspected.

Premises will be declared (see Section 5.2). A restricted area (RA) and control area (CA) will be declared around the infected premises (see Section 5).

**Movement controls**

Movement controls are best implemented through the declaration of declared areas and linking permitted movements to each area. As a general principle, the aim of movement controls is to reduce the spread of disease by preventing the movement of infected animals, infected animal products and infected vectors (where relevant for the disease), and by allowing movements that pose a minimal risk.

Section 6.4 provides details on movement controls for live animals, reproductive material (semen and in vivo–derived embryos), animal products and byproducts, waste products and effluent, and other items that might be contaminated.

4.3.3 Tracing and surveillance

It is important that tracing and surveillance be carried out thoroughly within the RA and CA, as the clinical signs of Aujeszky's disease may be unremarkable. Clinical inspections, an examination of herd reproduction records and serological testing will be necessary.

**Tracing**

Trace-back and trace-forward should involve tracing of movements of live pigs, and semen and embryos, over a period of several months; the period will depend on the type of herd involved. Table 4.1 shows the activities required and the priorities.
Table 4.1  Tracing and surveillance

<table>
<thead>
<tr>
<th>Tracing</th>
<th>Herd type</th>
<th>Activity</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trace-back</td>
<td>Properties that exported live pigs or semen to IPs</td>
<td>Bh, C</td>
<td>2</td>
</tr>
<tr>
<td>Trace-forward</td>
<td>DCPs/SPs in restricted area</td>
<td>Bm, C</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Herd imported breeders from IPs</td>
<td>A, Bh, C</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Herd imported nonbreeders from IPs</td>
<td>A, Bm, C</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Herd imported pigs from gatherings of pigs that included pigs from IPs</td>
<td>Bl, C</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Herd imported semen from IPs</td>
<td>Bh</td>
<td>3</td>
</tr>
</tbody>
</table>

**Activity key:**
- A = serological testing of identifiable imports
- B = serological testing of random samples with Bh (high intensity), Bm (medium intensity) or Bl (low intensity)
- C = examination of clinical and production records

**Priority key:**
- 1 = highest priority; 4 = lowest priority

DCP = dangerous contact premises; IP = infected premises; SP = suspect premises
Note: See Section 7 for further details on surveillance.

**Surveillance**

Serological testing, to determine herd and individual prevalences, will be prioritised to herds that have received animals from an IP, and to animals that originated from an IP or have had contact with such animals or pigs from DCPs and SPs.

The level of serological testing will be determined by:
- the number of introduced animals
- the time since introduction
- the degree of direct contact between introduced and other pigs in the herd
- the extent to which the flow of pigs through the herd compares with ‘all-in-all-out’
- the herd size.

Surveillance of feral pig populations may need to be considered, depending on the situation. If it is required, relevant wild animal management experts should be involved and the **Wild Animal Response Strategy Manual** consulted.

Certification of a premises (including artificial breeding centres) as free from Aujeszky’s disease would be based on serological monitoring — two negative tests at an interval of 2 months, annual retests, absence of clinical signs and appropriate biosecurity (including testing or certification of introductions). For the OIE recommendation on Aujeszky’s disease-free establishment, refer to Article 8.2.5 in the OIE Terrestrial Code.⁸

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⁸ www.oie.int/index.php?id=169&L=0&htmfile=chapitre_1.8.2.htm
4.3.4  Zoning and compartmentalisation for international trade

General considerations

The OIE sets international standards for the improvement of animal health and welfare, and veterinary public health worldwide, including standards for safe international trade in animals and their products.

According to the OIE Terrestrial Animal Health Code, establishing and maintaining a disease-free status throughout the country should be the final goal for OIE Members. However, given the difficulty of establishing and maintaining a disease-free status for an entire territory, especially for diseases whose entry is difficult to control through measures at national boundaries, there may be benefits to a Member in establishing and maintaining a subpopulation with a distinct health status within its territory. Subpopulations may be separated by natural or artificial geographical barriers ('zoning') or, in certain situations, by the application of appropriate management practices ('compartmentalisation'). In practice, spatial considerations and good management, including biosecurity plans, play important roles in the application of both concepts.

Compartmentalisation is based on biosecurity provisions of specific enterprises and is a joint industry–government undertaking. Zoning is based on geographic areas and is a government responsibility.

The OIE guidelines for Aujeszky's disease are in Chapter 8.2 of the OIE Terrestrial Code.

If desired, a zoning application would need to be prepared by the Australian Government in conjunction with the relevant jurisdiction(s). The recognition of zones must be negotiated bilaterally with trading partners and is not an overarching international agreement. Zoning will also require considerable resources that could otherwise be used to control an outbreak, and careful consideration will need to be given to prioritising these activities.

Agreements between trading partners will take time to develop, consider and finalise, as a result of the need for provision of detailed information, costing and resourcing, and national frameworks to underpin the approach that is developed. An importing country will need assurance that its animal health status is not compromised if it imports from an established Aujeszky's disease-free zone in Australia. It is not known how Australia's trading partners would react to a zoning proposal; some countries might not accept 'zoning'.

Eradication may be achieved before a decision on a free-zone application is reached.

Managing disease-free zones is a responsibility of veterinary authorities.

Specific considerations

Application of zoning, compartmentalisation or Aujeszky’s disease-free establishments may be appropriate if Aujeszky's disease is widespread (including in feral pigs) and premises or areas of different disease status need to be established on a long-term basis.

Since all pigs in a compartment would be of the same disease status, a compartment must lie entirely within a single declared area.

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9  www.oie.int/index.php?id=169&L=0&htmfile=chapitre_zoning_compartment.htm
Although there are no specific recommendations for Aujeszky’s disease–free compartments, the OIE standards do provide for Aujeszky’s disease–free establishments, which may be easier to achieve than a compartment (see Chapter 8.2, Article 8.2.7 of the OIE Terrestrial Code).

Once the extent of the outbreak has been defined, consideration will be given to declaring the rest of Australia free from the disease, based on zoning and/or compartmentalisation. Any claim for freedom will need to comply with OIE recommendations (see Chapter 8.2 of the OIE Terrestrial Code).

### 4.3.5 Vaccination

**General considerations**

Importation of Aujeszky’s disease vaccines is subject to the issuing of import permit(s) from the Australian Government Department of Agriculture and Water Resources. Supply and use of the vaccine in Australia will require an emergency permit and consent to import from the Australian Pesticides and Veterinary Medicines Authority. Importation, distribution, use and disposal of a vaccine that is a genetically modified organism must also be licensed by the Office of the Gene Technology Regulator, or permitted under an Emergency Dealing Determination by the minister responsible for gene technology, or other relevant and appropriate processes.

Vaccination will be approved by the NMG based on the recommendation of the CCEAD.

**Specific considerations**

Vaccination prevents clinical disease but not infection. Vaccinated animals shed less virus, suffer limited invasion of tissues and do not transmit virus across the placenta. Vaccination may be used to reduce the prevalence of infection in infected herds if a modified approach to eradication is adopted.

Various vaccines have been shown to be effective, but a gene-deleted vaccine is the vaccine of choice. The ELISA (enzyme-linked immunosorbent assay) serological test can differentiate between naturally infected animals and animals that have been inoculated with the gene-deleted vaccine. It is important that only one gene-deleted vaccine is approved, although recombination is unlikely to occur in the field. The use of a single vaccine will help to minimise the number of ELISA tests necessary for diagnosis.

Vaccination could be considered for breeding animals in herds with a high prevalence of infection, ensuring that all breeders and all growers that have lost their natural immunity (>10–12 weeks of age) are vaccinated.

### 4.3.6 Treatment of infected animals

The treatment of infected animals is ineffective and will not be undertaken.

### 4.3.7 Treatment of animal products and byproducts

Pigs and other susceptible species showing central nervous system signs will be killed on the property for humane reasons. Pathological samples may be collected and dispatched.
Under a modified stamping-out policy, seropositive pigs not showing clinical signs from IPs, DCPs or SPs may be salvaged through approved abattoirs, subject to condemnation and rendering of all offal. Clinically affected animals detected at antemortem or postmortem inspection will be condemned and tissues subjected to rendering at approved temperatures.

4.3.8 Disposal of animals, and animal products and byproducts

If movement of market-weight pigs to approved abattoirs is not possible, the pigs will be killed on the property. Animals killed on the property will be disposed of using a disposal option that is suitable for the disease and the site — see the Disposal Procedures Manual.

If semen or embryos (not handled according to IETS guidelines) are on the property, they will be disposed of.

4.3.9 Decontamination

Although fomites do not play a major role in the spread of Aujeszky's disease, areas where the disease has been detected will be decontaminated. Vehicles that have carried animals from infected farms will also be decontaminated. Sunlight will effectively inactivate the virus within 48 hours in open areas, although this would be expected to take longer in overcast weather or on moist green pasture.

Routine cleaning with detergents (including household detergents), followed by disinfection with any of the common disinfectants, will eliminate the virus (see Section 2.4.2). Refer to the Decontamination Manual for specific details of recommended disinfectants.

4.3.10 Wild animal control

Reduction in rodent numbers should be part of the decontamination program on infected farms.

Feral pigs present a risk to the domestic population if they are able to gather in any significant numbers close to, or are able to interact with pigs on, a commercial farm. The best way of protecting farms is to erect a pig-proof fence around the farm. Alternatively, a localised control and monitoring program can be established around the property to detect the presence of feral pigs and to control the pigs detected. Depopulation may be feasible in the case of a very localised outbreak in feral pigs.

For further details on wild animal control, refer to the Wild Animal Response Strategy, which includes a decision-making key to assist response to an EAD when wild animals may be implicated or pose a risk of disease transmission.

4.3.11 Vector control

Vector control is not applicable to Aujesky's disease.

4.3.12 Public awareness and media

The industry, the media and the public will need to be fully informed of the nature of Aujeszky's disease and the control programs that will be adopted, to allay any concerns and to attempt to maintain demand for pig products. There should be ongoing liaison with all groups to ensure the flow
of correct information and to maintain confidence in the product. Some opposition to the eradication strategies and concerns about the safety of the product are likely and may affect consumption.

Animal welfare concerns would need to be considered in any disease eradication campaign. An aggressive stamping-out strategy would cause concerns among some sectors of the public that apparently healthy animals are being slaughtered, especially given that there are effective vaccines that could be used in a control campaign. Misinformation and misunderstanding about the use of vaccine would need to be addressed.

A media campaign must emphasise the importance of farmers inspecting susceptible animals regularly and of reporting suspicious lesions and unusual deaths promptly. The ban on swill feeding should be reinforced, as well as the need to prevent contact between domestic and feral pigs.

Public awareness programs should emphasise that, although a wide range of species can be affected, close contact with pigs is necessary for infection to occur, and spread between other species is extremely rare.

4.4 Other strategies

A decision on the appropriate policy to be adopted will be made after an epidemiological investigation has determined whether Aujeszky’s disease is widespread and whether there is a high likelihood that the disease has become established. If clinical signs are unremarkable and there is evidence that the disease is widespread, the risk of the disease spreading to other farms while the investigation is being conducted is acceptable (based on the risks of severe economic loss and industry disruption from conducting immediate stamping out on all IPs).

A policy using modified stamping out with slaughter for human consumption will be adopted following the widespread detection of Aujeszky’s disease in domestic pigs (commercial and/or smallholdings). Modified stamping out aims to salvage as many animals as possible with minimal cost of control measures; it relies on the low likelihood of Aujeszky’s disease spreading between farms applying reasonable biosecurity. The policy may include:

- immediate depopulation — with salvage of some animals through abattoirs — when acute cases are present and/or when more than 25% of the breeding herd is serologically positive
- progressive depopulation over a period of months to take into consideration the presence of unsaleable pigs at the time of detection of disease; under this strategy, all sows will be culled after weaning litters and, initially, finishers will be removed as they reach the normal slaughter weight for the property
- culling seropositive reactors when they comprise less than 20–25% of the breeding herd, provided that segregation can be achieved between replaced and nonreplaced animals.

Vaccination using a gene-deleted vaccine may be used in certain circumstances — for example, to reduce the level of virus in certain populations while progressive depopulation is carried out, and to protect genetically valuable herds.

If it is likely that rapid stamping out will exhaust cost-shared resources (for example, if a very large piggery is the initial IP), the policy will be to slaughter (for human consumption) to reduce the prevalence, and increase biosecurity on the premises, until stamping out is practicable. Animal welfare issues will need to be managed.

If it is highly likely that Aujeszky’s disease has become established in domestic pigs and/or is broadly present in feral pigs, and the disease continues to spread despite the application of a stamping-out or modified stamping-out policy, the policy for long-term control (and possible eradication) of the
disease will be determined following consultation between the government and the pig industry. The policy adopted may involve increased biosecurity and long-term compartmentalisation in the commercial industry, with slaughter for human consumption. Vaccination at the discretion of owners may be an appropriate strategy, and the application of the OIE recommendations for disease-free zones may also be appropriate (Article 8.2.2 of the Terrestrial Code).

The accompanying strategies described in Section 4.3 will be applicable. IPs will still be subject to quarantine and movement controls, and vaccination will play a major role in disease control, together with testing and removal of infected animals. Tracing and surveillance will be used to help determine the extent of the disease and to help define disease-free premises and areas.

Increased industry liaison and education of producers to improve management practices will be important. All-in-all-out marketing and decreasing pig density are two strategies that should be followed.

The ongoing costs of control may need further review.

### 4.5 Funding and compensation

#### 4.5.1 General considerations

Details of the cost-sharing arrangements can be found in the Overview Document and the Valuation and Compensation Manual.
5 Guidelines for classifying declared areas and premises

5.1 Declared areas

A declared area is a defined tract of land that is subjected to disease control restrictions under emergency animal disease (EAD) legislation. There are two types of declared areas: restricted area (RA) and control area (CA).

Declared areas are risk based, with several areas or premises of higher risk nested within areas of lower risk.

All declared areas need to be clearly identified and easily understood, so that all affected parties can recognise which area they are in, and what regulations and control measures are applicable to them.

Declared areas are declared by a chief veterinary officer (CVO) or their delegate, or a ministerial declaration, according to the appropriate legislation of the states and territories involved.

5.1.1 Restricted area (RA)

An RA is a relatively small legally declared area around infected premises (IPs) and dangerous contact premises (DCPs) that is subject to disease controls, including intense surveillance and movement controls.

An RA will be a relatively small declared area\textsuperscript{10} (compared with a CA) drawn with at least 3-km radius around all IPs and DCPs, and including as many suspect premises (SPs), trace premises (TPs) and dangerous contact processing facilities (DCPFs) as practicable. Based on risk assessment, the RA is subject to intense surveillance and movement controls. The purpose of the RA is to minimise the spread of the EAD. The RA does not need to be circular but can have an irregular perimeter, provided that the boundary is initially an appropriate distance from the nearest IP, DCP, DCPF, SP or TP. Multiple RAs may exist within one CA.

The boundaries will be modified as new information becomes available, including from an official surveillance program. The actual distance in any one direction will be determined by factors such as terrain, the pattern of livestock movements, livestock concentrations, the weather (including prevailing winds), the distribution and movements of relevant wild (including feral) animals, and known characteristics of the disease agent. In practice, major geographic features and landmarks, such as rivers, mountains, highways and roads, are frequently used to demarcate the boundaries of the RA. Although it would be convenient to declare the RA on the basis of local government areas, this may not be practical, as such areas can be larger than the particular circumstances require.

\textsuperscript{10} As defined under relevant jurisdictional legislation
5.1.2 Control area (CA)

A CA is a legally declared area where the disease controls, including surveillance and movement controls, applied are of lesser intensity than those in an RA (the limits of a CA and the conditions applying to it can be varied during an incident according to need).

A CA is a disease-free buffer between the RA and the outside area (OA). Specific movement controls and surveillance strategies will be applied within the CA to maintain its disease-free status and prevent spread of the disease into the OA.

An additional purpose of the CA is to control movement of susceptible livestock for as long as is necessary to complete tracing and epidemiological studies, to identify risk factors, and forward and backward risk(s).

The CA will be a larger declared area around the RA(s) — initially, possibly as large as the state or territory in which the incident occurs — where restrictions will reduce the risk of disease spreading from the RA(s). The CA will have a minimum radius of 10 kilometres, encompassing the RA(s). It may be defined according to geography, climate and the distribution of relevant wild (including feral) animals. The boundary will be adjusted as confidence about the extent and distribution of the incident increases.

In general, surveillance and movement controls will be less intense in the CA than in the RA, and disease-susceptible animals and their products may be permitted to move under permit within and from the area.

5.1.3 Outside area (OA)

The OA is the area of Australia outside the declared (control and restricted) areas.

The OA is not a declared area but is used to describe the rest of Australia outside the declared areas. The OA will be subject to surveillance. Because it is highly desirable to maintain the OA as ‘disease free’, the movement of animals and commodities from the RA and CA into the OA will be restricted.

The OA will be of interest for ‘zoning’ and ‘compartmentalisation’ for purposes of trade access, as well as for disease control.

5.1.4 Other types of areas

It is possible that other types of areas (e.g., vaccination area or surveillance area), which are not legally declared, may be used for disease control purposes in some jurisdictions.

5.2 Declared premises

The status of individual premises will be declared after an epidemiological risk assessment has been completed.

Based on the disease risk they present, the highest priorities for investigations are IPs, DCPs, DCPFs, SPs and TPs.

In a disease outbreak, not all classifications may be needed. Premises classifications are mutually exclusive — that is, a given premises can have only one classification at any given time. After an
epidemiological investigation, clinical assessment, risk assessment or completion of control measures, a premises may be reclassified.

5.2.1 Infected premises (IP)

An IP is a defined area (which may be all or part of a property) on which animals meeting the case definition are or were present, or the causative agent of the EAD is present, or there is a reasonable suspicion that either is present, and that the relevant CVO or their delegate has declared to be an IP.

A premises with susceptible animals that have met the case definition will be declared an IP. For most diseases, the RA(s) will include all IPs.

For most diseases, the classification of a premises as an IP would be followed by the declaration of the areas around it as an RA and a CA. In the case of vector-borne diseases, a transmission area (TA) may also be identified, if required.

Depending on the situation, control measures in accordance with the agreed Emergency Animal Disease Response Plan (EADRP) or the relevant AUSVETPLAN disease strategy or response policy brief may be applied immediately, or may await the outcomes of further investigation of the IP.

When the required control measures for an IP have been completed, the premises would be classified as a resolved premises (RP). After further risk assessment, it may be reclassified as:

- a zero susceptible species premises (ZP), if destocked
- an at-risk premises (ARP) with a vaccination qualifier (ARP-VN), if not destocked, and vaccinated
- an ARP with an assessed-negative qualifier (ARP-AN), if neither destocked nor vaccinated.

If a premises has been classified as an IP on the basis of clinical signs as per the case definition, and subsequently both the EAD and the causative agent are confirmed as absent (ie a ‘false’ declaration), the premises would be reclassified as an RP. Thereafter, depending on the specific disease and its epidemiology, it would be reclassified as a ZP or an ARP (the qualifiers AN and/or VN may also be used, depending on the actions taken on the premises).

5.2.2 Suspect premises (SP)

SP is a temporary classification of a premises that contains a susceptible animal(s) not known to have been exposed to the disease agent but showing clinical signs similar to the case definition, and that therefore requires investigation(s).

For most diseases, the RA should contain as many SPs as practical. Every effort should be made to investigate and reclassify SPs as soon as possible. SPs are considered a very high priority for veterinary investigations. The investigation and risk assessment may produce the following outcomes:

- If the case definition is confirmed, the premises would be classified as an IP.
- If the case definition is not confirmed but suspicion remains, the premises would continue to be classified as an SP, until further investigation determines its reclassification.

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11 Less contagious diseases (eg Hendra virus, anthrax, Australian bat lyssavirus) do not use declared areas as part of their control measures. See the applicable AUSVETPLAN disease strategies or response policy briefs for details.

12 An EADRP will usually be prepared for consideration at the first CCEAD meeting, at the start of a disease response.

13 During the early phase of an EAD response, a comprehensive ‘initial case definition’ is used — eg individual and herd clinical signs, epidemiological investigation and risk assessment, and laboratory evaluation. Later in the response, the ‘response case definition’ may be used, which may be only clinical signs and on-site clinical assessment.
• If the case definition is ruled out, the premises would be given the qualifier AN. If it is located in the RA, it would then be reclassified as an ARP with the qualifier AN (ARP-AN). If it is located in the CA, it would be classified as a premises of relevance (POR) with the qualifier AN (POR-AN).

5.2.3 Trace premises (TP)

TP is a temporary classification of a premises that contains a susceptible animal(s) that tracing indicates may have been exposed to the disease agent, or contains contaminated animal products, wastes or things, and that requires investigation(s).

For most diseases, the RA should include as many TPs as practical. Every effort should be made to investigate and reclassify a TP as soon as possible. Exposure may occur from animal movements, contaminated material, vehicles, equipment and fomites, as well as via aerosol, especially if the premises is contiguous with an IP. The investigation and an epidemiological assessment may produce the following outcomes:

• If the case definition is met, the premises would be classified as an IP.
• If it appears highly likely that the disease is present and that the TP is highly likely to contain an infected animal(s) or contaminated animal products, wastes or things, even though there are no visible clinical signs, the premises would be classified as a DCP or a DCPF.
• If the investigation shows no evidence of the EAD, the premises would be assessed as negative. If it is located in the RA and there are susceptible animals remaining, it would then be reclassified as an ARP with the qualifier AN (ARP-AN). If it is located in the CA, it would be classified as a POR with the qualifier AN (POR-AN).
• If the tracing investigation reveals no susceptible animals or risk products, wastes or things on the destination premises, a TP may be reclassified as a ZP.

5.2.4 Dangerous contact premises (DCP)

A DCP is a premises, apart from an abattoir, knackery or milk processing plant or other such facility, that, after investigation and based on a risk assessment, is considered to contain a susceptible animal(s) not showing clinical signs, but considered highly likely to contain an infected animal(s) and/or contaminated animal products, wastes or things that present an unacceptable risk to the response if the risk is not addressed, and that therefore requires action to address the risk.

During the initial phase of a response, the RA should contain all the DCPs. As the incident develops, epidemiological investigation and tracing from IPs, SPs and TPs within the RA could identify DCPs that are sufficiently distant that they are outside the existing RAs and within the CA. This could trigger an extension of the RA to include them. However, it may prove impractical to extend an RA if the DCP is sufficiently distant from the existing RA. The trigger to declare a separate RA would be the identification of an IP. A DCP on its own does not trigger an RA. In these cases, it is possible that a DCP would be situated within a CA.

Whether an RA is drawn around a DCP depends on whether the transmission risk can be contained on the premises using premises-specific measures, or whether there is a need for RA measures to be applied as well, involving surrounding properties in heightened surveillance and tighter movement controls. The characteristics of the disease and its behaviour will be the major determinant. The risk assessment would consider these, as well as the stage of the response, the animal(s) present and the local situation.
Although susceptible animals on such premises are not showing clinical signs, they are considered to have been significantly exposed to the disease agent — this might be via an infected animal(s); a vector; contaminated animal products, wastes or things; or another transmission mechanism. If susceptible animals on a premises were exhibiting clinical signs that were similar to the case definition, the premises must be classified as an SP.

Since a DCP presents an unacceptable risk to the response if the risk is not addressed, such premises are subjected to appropriate control measures, including ongoing epidemiological monitoring, risk assessment and investigation, as required. Monitoring, risk assessment or investigation of a DCP may produce the following outcomes:

- If the presence of an infected animal or contaminated animal products, wastes or things is confirmed, the premises would be classified as an IP.
- If their presence is not confirmed but the likelihood is considered to remain high, the premises would continue to be classified as a DCP until completion of control measures enables it to be reclassified as an RP. A subsequent risk assessment would allow it to be reclassified as an ARP with an AN qualifier. If animals had been vaccinated as part of the control measures, the premises may also have the qualifier VN.
- If it is considered unlikely that an infected animal or contaminated animal products, wastes or things are present, the premises would be assessed as negative (DCP-AN). If it is located in the RA, it would then be reclassified as an ARP with the qualifier AN. If it is located in the CA, it would be classified as a POR with the qualifier AN.

Once the control measures are completed, the DCP will be reclassified as an RP.

5.2.5 Dangerous contact processing facility (DCPF)

A DCPF is an abattoir, knackery, milk processing plant or other such facility that, based on a risk assessment, appears highly likely to have received infected animals, or contaminated animal products, wastes or things, and that requires action to address the risk.

Particularly for DCPFs, classification provides authorities with a framework for the exercise of legal powers over the premises and to facilitate product tracking, and serves as a communication tool for reporting nationally and internationally on progress in the response.

Since a DCPF presents an unacceptable risk to the response if the risk is not addressed, such premises are subjected to appropriate control measures, including ongoing epidemiological monitoring, risk assessment and investigation, as required. Monitoring, risk assessment and investigation of a DCPF may produce the following outcomes:

- If the presence of an infected animal or contaminated animal products, wastes or things is confirmed, the premises would be classified as an IP.
- If their presence is not confirmed but the likelihood is considered to remain high, the premises would continue to be classified as a DCPF until completion of control measures enables it to be reclassified as an RP. A subsequent risk assessment may allow it to be reclassified as an approved processing facility (APF), if increased biosecurity measures are maintained.
- If it is considered unlikely that an infected animal or contaminated animal products, wastes or things are present, the premises would be assessed as negative (DCPF-AN). It may then be reclassified as an APF, if increased biosecurity measures are maintained.

Once the control measures are completed, the DCPF will be reclassified as an RP.
If, as part of disease control management, a DCPF is used to slaughter suspect or infected animals, it will be reclassified as an IP until it meets the definition for an APF or ZP.

### 5.2.6 Approved processing facility (APF)

An APF is an abattoir, knackery, milk processing plant or other such facility that maintains increased biosecurity standards. Such a facility could have animals or animal products introduced from lower risk premises under a permit for processing to an approved standard.

Before being classified as an APF, the premises is assessed to confirm that it has not received infected animals, or contaminated animal products, wastes or things, and is operating according to agreed biosecurity standards.

If, during the course of a response, the premises is suspected to have received infected animals, or contaminated animal products, wastes or things, it will be reclassified as a DCPF pending further investigation.

### 5.2.7 At-risk premises (ARP)

An ARP is a premises in an RA that contains a live susceptible animal(s) but is not considered at the time of classification to be an IP, DCP, DCPF, SP or TP.

The animal(s) on such premises are subject to disease control procedures, such as regular surveillance and movement restrictions, that are appropriate to the RA.

### 5.2.8 Premises of relevance (POR)

A POR is a premises in a CA that contains a live susceptible animal(s) but is not considered at the time of classification to be an IP, SP, TP, DCP or DCPF.

The animal(s) on such premises are subject to disease control procedures, such as heightened surveillance and movement restrictions, that are appropriate to the CA.

### 5.2.9 Resolved premises (RP)

An RP is an IP, DCP or DCPF that has completed the required control measures and is subject to the procedures and restrictions appropriate to the area in which it is located.

Later in a response, as control measures on IPs, DCPs and DCPFs are completed, the premises are reclassified to RP, and their risk status is progressively reviewed.

After appropriate investigation and risk assessment, an RP will become an ARP, POR, ZP or APF.

### 5.2.10 Unknown status premises (UP)

A UP is a premises within a declared area where the current presence of susceptible animals and/or risk products, wastes or things is unknown.
If an investigation and epidemiological risk assessment on a UP confirmed:

- the presence of an infected animal or contaminated animal products, wastes or things, the premises would be classified as an IP
- that it contained no susceptible animals and/or risk products, wastes or things, the UP would be reclassified as a ZP
- the presence of susceptible animals and excluded the presence of an EAD or the causative agent of the EAD, the UP would be reclassified as an ARP if in the RA, or a POR if in the CA
- clinical signs similar to the case definition, the UP would be reclassified as an SP
- an epidemiological link to a risk premises, the UP would become a TP
- a high-risk epidemiological link but without clinical signs of an EAD, the UP would be reclassified as a DCP or DCPF.

5.2.11 Zero susceptible species premises (ZP)

A ZP is a premises that does not contain any susceptible animals or risk products, wastes or things.

5.2.12 Qualifiers

The following qualifying categories may be added to a property status.

Assessed negative (AN)

AN is a qualifier that may be applied to ARPs, PORs and premises previously defined as SPs, TPs, DCPs or DCPFs that have undergone an epidemiological and/or laboratory assessment and have been cleared of suspicion at the time of classification, and can progress to another status. The animals on such premises are subject to the procedures and movement restrictions appropriate to the declared area (RA or CA) in which the premises is located.

This classification is a description to document progress in the response and in the proof-of-freedom phase. The AN qualifier is a temporary status and only valid at the time it is applied. The time that the AN qualifier remains active will depend on the circumstances and will be decided by the jurisdiction. One day is considered a reasonable guideline. The AN qualifier should also provide a trigger for future surveillance activity to regularly review, and change or confirm, a premises status.

The AN qualifier can also function as a counting tool to provide quantitative evidence of progress, to inform situation reports in control centres during a response. It provides a monitor for very high-priority premises (SPs and TPs) as they undergo investigations and risk assessment, and are reclassified, as well as a measure of surveillance activity overall for ARPs and PORs.

The AN qualifier can be applied in a number of ways, depending on the objectives and processes within control centres. The history of each premises throughout the response is held in the information system; the application of the AN qualifier is determined by the jurisdiction, the response needs and the specific processes to be followed in a local control centre.

Vaccinated (VN)

VN is a qualifier that can be applied in a number of different ways. At its most basic level, it can be used to identify premises that contain susceptible animals that have been vaccinated against Aujeszky's disease. However, depending on the legislation, objectives and processes within a
jurisdiction, the VN qualifier may be used in different ways to track a range of criteria and parameters. The details would need to be developed and tailored to meet individual needs of jurisdictions and circumstances.

Some of the issues that could be included for consideration are detailed below.

**Definition and monitoring of vaccination**

The vaccination status of a population of animals or premises might be important when considering movement controls and the proof-of-freedom phase.

For the purposes of AUSVETPLAN, the following guidance should be followed.

To be referred to as a vaccinated population, the population must have been vaccinated in accordance with:

- the Australian Pesticides and Veterinary Medicines Authority (APVMA) registered label particulars, or
- APVMA-approved permit instructions relating to an approved EADRP for off-label use or use of an unregistered immunobiological product(s), or
- instructions of the relevant CVO.

**Monitoring vaccination programs**

A mechanism for recording and monitoring primary and booster vaccinations for all vaccinated animals should be part of the disease control monitoring system, to provide information on the control of the outbreak as well as evidence for proof of freedom. For example, jurisdictions may choose to add numbers to the qualifiers to indicate primary (VN1) or booster (VN2) vaccinations.

**Incomplete vaccination programs**

Vaccination programs during emergency responses are not always completed by the time a response is terminated. Therefore, there may be populations of animals present in the proof-of-freedom phase that are only partially vaccinated and will need to be accounted for, particularly if serology is used for proof of freedom.

**Vaccination records and identification of vaccinated animals**

The key requirement in an EAD response in which vaccine is used will be to identify animals that have been vaccinated (fully or partially) so they can be disposed of or tested in the proof-of-freedom phase. Records of the number of doses administered and their timing can be kept to identify fully vaccinated premises and premises that have not completed the planned vaccination program (partially vaccinated) or are overdue for booster vaccinations.

In cattle, the National Livestock Identification System (NLIS) can record the animals vaccinated. For other species, the NLIS still relies on mob identification. Where appropriate, individual animal identification by means other than the NLIS (eg individual animal management tags, microchips (radio-frequency identification), collars) may be necessary.

### 5.3 Guidelines for reclassifying previously declared areas

Maintaining movement restrictions on areas for long periods has important implications for resource management, animal welfare, business continuity, and socioeconomic impacts on producers and regional communities.
During the course of an EAD response, it may become necessary for a CA or RA to be expanded, as additional geographic areas or new foci of infection are identified. Later in the response, as control is achieved, mechanisms for gradually reducing the size of the CA and RA can be introduced.

An EAD may involve multiple foci of infection, with several jurisdictions potentially involved. Since disease might be controlled at different rates in different areas, there may be the opportunity to progressively lift restrictions on an area basis. This would involve reclassifying previously declared areas (RAs and CAs), with a staged approach to lifting of movement restrictions. This is a key step in the recovery process and will have positive benefits on the community.

The lifting of restrictions in declared areas is managed by jurisdictions according to their local legislation, regulations and processes.

The key principles for reclassifying a previously declared area during a response should include the following, noting that not all will be relevant for some diseases:

- The area should be epidemiologically distinct from other declared areas.
- All TPs and SPs have been investigated and reclassified, and all IPs, DCPs and DCPF in the area have been reclassified as RPs.
- All tracing and surveillance associated with EAD control has been completed satisfactorily, with no evidence or suspicion of infection in the area.
- A minimum period of 'x' days\(^1\) has elapsed since pre-determined disease control activities and risk assessment were completed on the last IP or DCP in the area.
- An approved surveillance program (including the use of sentinel animals, if appropriate) has confirmed no evidence of infection in the RA (see below).
- For vector-borne diseases, vector monitoring and absence of transmission studies indicate that vectors are not active.

Lifting of restrictions is a process managed by the combat CVO under jurisdictional legislation and consistent with the most current agreed EADRP. When the appropriate conditions are satisfied, a combat jurisdiction can, in consultation with the Consultative Committee on Emergency Animal Diseases (CCEAD), reduce the size of the RA or lift all restrictions. The previous part of the RA would then become part of the CA. Jurisdictions should be able to present documented evidence that the appropriate conditions have been met.

When an RA is lifted and becomes part of the CA, it will have a lower risk status, and the movement restrictions that apply will be consistent with those applying within the CA. Over time, all of the RAs will be reduced and lifted.

If there is more than one combat jurisdiction involved, each will use its own appropriate legal jurisdictional mechanisms to lift the declaration of the RA or CA, coordinating with each other and consulting with the CCEAD to ensure wide communication and coordination.

After a further period of surveillance and monitoring, and provided that the additional surveillance and monitoring find no evidence of infection, a jurisdiction, in consultation with the CCEAD, could lift the CA. This would result in the lifting of all the remaining regulatory controls associated with the response, and a return to business as usual.

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\(^1\) The minimum period uses, or is based on, the disease-specific incubation periods defined by the OIE — two incubation periods is a common guideline.
6 Quarantine and movement controls

6.1 General principles

The principles for the recommended quarantine practices and movement controls are as follows:

- Containment and eradication of Aujeszky’s disease is the highest priority. Therefore, ‘normal business movements’ are not allowed.
- Live animals pose the greatest risk of disease spread; therefore, their movements from all premises within the restricted area (RA) and control area (CA) must be strictly controlled.
- The outside area (OA) should remain as ‘clean’ as possible. Therefore, movement of animals from the RA to the OA is prohibited, and movement of products is generally prohibited. Movement of animals and products from the CA to the OA will also be restricted.
- Trace premises (TP) and suspect premises (SP) are temporary classifications, and every effort should be made to resolve the status of these premises as soon as possible.
- The numbers of susceptible animals within the RA should be minimised. Therefore, movements of animals into the RA will be limited and usually for slaughter only.
- Movement restrictions are more stringent within the RA than within the CA, and will be more stringent in the early stages of the response.
- Movement controls may be varied during a response from those listed here. However, this will involve a variation to the agreed Emergency Animal Disease Response Plan, with endorsement by the Consultative Committee on Emergency Animal Diseases (CCEAD) and the National Management Group (NMG).
- Recommended movement controls apply to any movement off a premises, whether on foot or by vehicle, that involves either public or private land.

6.2 Guidelines for issuing permits

When assessing risk for the purposes of issuing a permit, the elements to consider may include:

- sources of risk
  - species of animal
  - type of product
  - presence of disease agent on both the originating and destination premises
  - current vector activity, if relevant
  - organisation and management issues (ie confidence in animal tracing and surveillance, biosecurity)
  - proposed use of the animals or products
  - proposed transport route
  - vaccination status of the animals (if relevant)
  - treatment of animals and vehicles to prevent concurrent movement of vectors, if relevant
  - security of transport
  - security and monitoring at the destination
  - environment and natural events
  - community and human behaviour
  - risk of sabotage
  - technology
- regulations and standards
- available resources for compliance and enforcement

• areas of impact
  - livestock health (health of affected species, including animal welfare)
  - human health (including work health and safety)
  - trade and economic impacts (including commercial and legal impacts)
  - environmental impacts
  - organisational capacity
  - political impacts
  - reputation and image

• proposed risk treatment measures
  - vaccination
  - processing of product
  - disinfection or other treatment of animals, vehicles and fomites
  - vector control, if relevant
  - security
  - communication.

6.3 Types of permits

Permits are either general or special. They are legal documents that describe the animal(s), commodities or things to be moved, the origin and destination, and the conditions to be met for the movement. Either type of permit may include conditions. Once permit conditions have been agreed from an operational perspective, all permit conditions must be met for every permit. Both general and special permits may be in addition to documents required for routine movements between or within jurisdictions (eg health certificates, waybills, consignment notes, National Vendor Declarations).

6.3.1 General permit

General permits (GPs) are used for lower risk movements, and create a record of each movement to which they apply. They are granted without the need for direct interaction between the person moving the animal(s), commodity or thing and a government veterinarian or gazetted inspector of stock. The permit may be completed via a webpage or in an approved place (such as a government office or commercial premises). A printed version of the permit must accompany the movement. The permit may impose preconditions and/or restrictions on movements. GPs may not be available until the relevant chief veterinary officer (CVO) gives approval for general movements, and this may not be available in the early stages of a response.

6.3.2 Special permit

Special permits (SpPs) are issued by the relevant government veterinarian or gazetted inspector of stock. They are used for higher risk movements, and therefore require formal application and individual risk assessment. SpPs describe the requirements for movement of an animal (or group of animals), commodity or thing, for which a specific assessment has been conducted by the relevant
government veterinarian or gazetted inspector of stock. A printed version of the permit must accompany the movement. The permit may impose preconditions and/or restrictions on movements.

**Emergency permit**

An emergency permit is a special permit that specifies strict legal requirements for an otherwise high-risk movement of an animal, to enable emergency veterinary treatment to be delivered, to enable animals to be moved for animal welfare reasons, or to enable any other emergency movement under exceptional circumstances. These permits are issued on a case-by-case basis under the authorisation of the relevant CVO.

### 6.4 Recommended quarantine practices and movement controls

The initial detection of an IP will require immediate implementation of quarantine to try to contain the disease within the confines of the IP. Follow-up measures of tracing and surveillance will assist in determining further action and will readily identify further IPs, DCPs and SPs. Movement controls will be implemented as soon as restricted areas (RAs) and control areas (CAs) are declared.

Quarantine will include measures to prevent contact with wild pigs, to eliminate or exclude rodents, to prevent movement of pigs to other premises and to prevent people and fomites that may present a risk from coming into contact with other piggeries.

Movement of clinically affected animals to other pig-producing premises or saleyards will not be permitted, but movement of animals that are free from clinical signs direct to immediate slaughter will be allowed. Destruction and sanitary disposal of clinically affected animals should occur on the IP but may be permitted at an approved abattoir under supervision.

Early in a response to Aujeszky's disease, the affected jurisdiction(s) will reinforce the message that swill feeding is illegal. Therefore, movements of meat products within the RA and CA would generally be allowed, under permit (see Section 6.4.3).

An area matrix showing movement controls has been developed for each risky commodity (see the following sections), and premises matrices would be developed as necessary.

Although the default policy for Aujeszky's disease is to control and eradicate the disease in the shortest possible time, a modified stamping-out policy might be applied in situations where circumstances allow the safe slaughter of pigs (for human consumption) at approved abattoirs. To facilitate slaughter, an RA should include an approved abattoir, if possible.

#### 6.4.1 Live susceptible animals

**Pigs**

Because of the risk of transmitting Aujeszky's disease, movement of live pigs from high-risk premises is prohibited, except for pigs being moved for slaughter, under permit. Movement of pigs out of the RA is prohibited. Movement of live pigs into an RA is restricted, to minimise the number of susceptible animals within the RA, and is for slaughter only.
Table 6.1 describes the recommended movement controls for live pigs within and between declared areas.

### Table 6.1  Recommended movement controls for live pigs

<table>
<thead>
<tr>
<th>To→</th>
<th>RA</th>
<th>CA</th>
<th>OA</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>IP/DCP/SP/TP</td>
<td>ARP/DCPF</td>
<td>SP/TP</td>
</tr>
<tr>
<td>RA</td>
<td>Prohibited</td>
<td>Prohibited, except under SpP1</td>
<td>Prohibited</td>
</tr>
<tr>
<td>ARP</td>
<td>Prohibited, except under SpP2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td>Prohibited, except under SpP3</td>
<td>Prohibited</td>
<td>Prohibited</td>
</tr>
<tr>
<td>POR</td>
<td>Prohibited, except under GP1</td>
<td>Prohibited</td>
<td></td>
</tr>
<tr>
<td>OA</td>
<td>Prohibited, except under SpP3</td>
<td>Prohibited</td>
<td>Prohibited, except under GP1</td>
</tr>
</tbody>
</table>

ARP = at-risk premises; CA = control area; DCP = dangerous contact premises; DCPF = dangerous contact processing facility; GP = general permit; IP = infected premises; OA = outside area; POR = premises of relevance; RA = restricted area; SP = suspect premises; SpP = special permit; TP = trace premises

**Notes for Table 6.1**

The transit of live pigs is allowed under a transit permit, provided that the origin and destination of the pigs are both outside the declared area, the pigs are not unloaded and the vehicle does not stop en route.

**SpP1 conditions:**

- For slaughter only, in situations where a modified stamping-out policy has been adopted.
- Travel by approved route only, and no stopping en route.
- Appropriate biosecurity standard at receiving premises.
- Appropriate decontamination of equipment and vehicles.
- Absence of clinical signs before and on day of travel.
- Single consignment per load.
- Physical identification of individual animals (e.g., ear tag, brand), with accompanying movement documentation (e.g., National Vendor Declaration, waybill, PigPass).
- Pigs from IPs, DCPs, TPs and SPs are slaughtered at abattoirs on different days from pigs from other premises, and the abattoir is decontaminated before reuse.
- Product derived from pigs from IPs, DCPs, TPs and SPs must be rendered/processed or cooked to inactivate the virus.
SpP2 conditions:

- For slaughter, or to an ARP for other purposes if a risk analysis indicates that the risk associated with movement is acceptable within the response.
- Travel by approved route only, and no stopping en route.
- Appropriate biosecurity standard at receiving premises.
- Appropriate decontamination of equipment and vehicles.
- Absence of clinical signs before and on day of travel.
- Single consignment per load.
- Physical identification of individual animals (eg ear tag, brand), with accompanying movement documentation (eg National Vendor Declaration, waybill, PigPass).

SpP3 conditions:

- For slaughter only.
- Travel by approved route only, and no stopping en route.
- Appropriate biosecurity standard at receiving premises.
- Appropriate decontamination of equipment and vehicles.
- Absence of clinical signs before and on day of travel.
- Single consignment per load.
- Physical identification of individual animals (eg ear tag, brand), with accompanying movement documentation (eg National Vendor Declaration, waybill, PigPass).

GP1 conditions:

- For slaughter, movement within an approved compartment or movement to other PORs.
- Absence of clinical signs before and on day of travel.
- Appropriate decontamination of vehicles and equipment.
- Travel by approved route only, and no stopping en route.

Physical identification of individual animals (eg ear tag, brand), with accompanying movement documentation (eg National Vendor Declaration, waybill, PigPass).

Ruminants

Aujeszky’s disease can affect ruminants, although the disease is invariably fatal in those species. Every effort should be made to prevent contact between infected pigs and ruminants. The movement of ruminants poses a relatively low risk of spread of the virus.

Table 6.2 shows the recommended movement controls for ruminants within and between declared areas.
**Table 6.2**  
**Recommended movement controls for ruminants**

<table>
<thead>
<tr>
<th>To→</th>
<th>From</th>
<th>RA</th>
<th>CA</th>
<th>OA</th>
</tr>
</thead>
<tbody>
<tr>
<td>RA</td>
<td></td>
<td>Prohibited, except under GP7</td>
<td>Prohibited, except under GP7</td>
<td>Prohibited, except under GP7</td>
</tr>
<tr>
<td>CA</td>
<td></td>
<td>Prohibited, except under GP7</td>
<td>Prohibited, except under GP7</td>
<td>Prohibited, except under GP7</td>
</tr>
<tr>
<td>OA</td>
<td></td>
<td>Allowed</td>
<td>Allowed</td>
<td>Allowed</td>
</tr>
</tbody>
</table>

CA = control area; GP = general permit; OA = outside area; RA = restricted area

**Notes for Table 6.2**

**GP7 conditions:**

- Travel by approved route only, and no stopping en route.
- Appropriate biosecurity standard at receiving premises.
- Appropriate decontamination of equipment and vehicles.
- Absence of clinical signs before and on day of travel.
- Single consignment per load.
- Physical identification of individual animals (eg ear tag, brand), with accompanying movement documentation (eg National Vendor Declaration, waybill).

**6.4.2 Semen and embryos from live susceptible animals**

**Pig semen**

Since Aujeszky’s disease can be transmitted by semen, movement of semen from high-risk premises and out of the RA will be prohibited. To enable business continuity, semen sourced from properties in the CA and OA can be moved into the RA and CA under permit.

Table 6.3 describes the recommended movement controls for pig semen within and between declared areas.
### Table 6.3  Recommended movement controls for pig semen

<table>
<thead>
<tr>
<th>To</th>
<th>RA</th>
<th>CA</th>
<th>OA</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>IP/DCP/SP/TP</td>
<td>ARP</td>
<td>SP/TP</td>
</tr>
<tr>
<td>RA</td>
<td>Prohibited</td>
<td>Prohibited</td>
<td>Prohibited</td>
</tr>
<tr>
<td>ARP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td>Prohibited</td>
<td>Prohibited</td>
<td>Prohibited</td>
</tr>
<tr>
<td>POR</td>
<td>Prohibited, except under SpP4</td>
<td>Prohibited, except under SpP4</td>
<td></td>
</tr>
<tr>
<td>OA</td>
<td>Prohibited, except under GP2</td>
<td>Prohibited, except under GP2</td>
<td>Allowed</td>
</tr>
</tbody>
</table>

ARP = at-risk premises; CA = control area; DCP = dangerous contact premises; GP = general permit; IP = infected premises; OA = outside area; POR = premises of relevance; RA = restricted area; SP = suspect premises; SpP = special permit; TP = trace premises

#### Notes for Table 6.3

**SpP4 conditions:**

- Owner declaration and evidence that the boars have been tested twice in the previous 14 days, at least 5 days apart, with negative results, with the second test occurring less than 72 hours before collection of semen.
- Evidence of an operational biosecurity manual, including maintenance of biosecurity procedures, accurate record keeping, and semen containers being adequately clean and biosecure.
- Absence of clinical signs before and on the day of collection and since that time.

**GP2 conditions:**

- Owner declaration that the boars have been tested twice in the previous 14 days, at least 5 days apart, with negative results, with the second test occurring less than 72 hours before collection of semen.
- Absence of clinical signs before and on the day of collection and since that time.
- Accurate record keeping of all semen movements off the property.
- Evidence of an operational biosecurity manual, including maintenance of biosecurity procedures.

**In vivo–derived pig embryos**

The risk of spread of Aujeszky's disease virus by embryos is very low if the embryos are collected and handled appropriately.

Table 6.4 describes the recommended movement controls for pig embryos within and between declared areas.
Table 6.4  Recommended movement controls for in vivo–derived pig embryos

<table>
<thead>
<tr>
<th>To→ From</th>
<th>RA From RA</th>
<th>CA From CA</th>
<th>OA From OA</th>
</tr>
</thead>
<tbody>
<tr>
<td>RA</td>
<td>Prohibited, except under GP3</td>
<td>Prohibited, except under GP3</td>
<td>Prohibited, except under GP3</td>
</tr>
<tr>
<td>CA</td>
<td>Prohibited, except under GP3</td>
<td>Prohibited, except under GP3</td>
<td>Prohibited, except under GP3</td>
</tr>
<tr>
<td>OA</td>
<td>Prohibited, except under GP3</td>
<td>Prohibited, except under GP3</td>
<td>Allowed</td>
</tr>
</tbody>
</table>

CA = control area; GP = general permit; OA = outside area; RA = restricted area

Notes for Table 6.4

GP3 conditions:

- Embryos collected and handled in accordance with the procedures detailed in the International Embryo Transfer Society (IETS) manual (4th edition, 2010).
- Absence of clinical signs before and on the day of collection and since that time.
- Accurate record keeping of all embryo movements off the property.
- Evidence of an operational biosecurity manual, including maintenance of biosecurity procedures.

6.4.3 Meat and meat products

The risks from pigmeat and offal are addressed primarily through movement controls on live pigs going to slaughter and the fact that swill feeding to pigs is illegal. Because Aujeszky’s disease is not a zoonosis, disease concerns are limited to disease in pigs arising from the diversion of pigmeat or offal for pig feed.

Table 6.5 describes the recommended movement controls for fresh/frozen pigmeat and offal within and between declared areas.
Table 6.5  Recommended movement controls for fresh/frozen pigmeat and offal

<table>
<thead>
<tr>
<th>To→ From</th>
<th>RA</th>
<th>CA</th>
<th>OA</th>
</tr>
</thead>
<tbody>
<tr>
<td>RA</td>
<td>Prohibited, except under SpP5</td>
<td>Prohibited, except under SpP5</td>
<td>Prohibited, except under SpP5</td>
</tr>
<tr>
<td>CA</td>
<td>Prohibited, except under GP4</td>
<td>Prohibited, except under GP4</td>
<td>Prohibited, except under GP4</td>
</tr>
<tr>
<td>OA</td>
<td>Allowed</td>
<td>Allowed</td>
<td>Allowed</td>
</tr>
</tbody>
</table>

CA = control area; GP = general permit; OA = outside area; RA = restricted area; SpP = special permit

Notes for Table 6.5

SpP5 conditions:

- Pigmeat and offal derived from pigs from DCPFs must be rendered/processed into meat meal, blood meals or other cooked products.
- The material is not brought into direct or indirect contact with susceptible animals.
- Every precaution is taken to ensure that effluent, other fluids or aerosols do not leak out of the transport vehicle.
- Transport vehicle and containers are decontaminated under supervision between loads.

GP4 conditions:

- The material is not brought into direct or indirect contact with susceptible animals.
- Every precaution is taken to ensure that effluent, other fluids or aerosols do not leak out of the transport vehicle.
- Transport vehicle and containers are decontaminated between loads.

6.4.4 Waste products and effluent

Pig effluent can transmit Aujeszky’s disease virus; therefore, movement of piggery wastes from high-risk premises and out of the RA is generally prohibited. The exception is from IPs, after depopulation, to properties without susceptible livestock (ZPs) and under permit. To maintain business continuity, piggery wastes from the OA may be moved onto a ZP within the RA under permit.

Table 6.6 shows the recommended movement controls for pig waste products and effluent within and between declared areas.
### Table 6.6  Recommended movement controls for waste products and effluent

<table>
<thead>
<tr>
<th>To→ From</th>
<th>RA</th>
<th>CA</th>
<th>OA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IP/DCP/SP/TP/ARP</td>
<td>ZP (within RA)</td>
<td>SP/TP</td>
</tr>
<tr>
<td>RA</td>
<td>Prohibited</td>
<td>Prohibited, except under SpP6</td>
<td>Prohibited</td>
</tr>
<tr>
<td></td>
<td>DCP/SP/TP</td>
<td>Prohibited</td>
<td>Prohibited</td>
</tr>
<tr>
<td></td>
<td>ARP</td>
<td>Prohibited, except under SpP6</td>
<td>Prohibited, except under SpP6</td>
</tr>
<tr>
<td>CA</td>
<td>SP/TP</td>
<td>Prohibited</td>
<td>Prohibited</td>
</tr>
<tr>
<td></td>
<td>POR</td>
<td>Prohibited</td>
<td>Prohibited, except under GP5</td>
</tr>
<tr>
<td>OA</td>
<td>OA</td>
<td>Prohibited</td>
<td>Allowed</td>
</tr>
</tbody>
</table>

ARP = at-risk premises; CA = control area; DCP = dangerous contact premises; GP = general permit; IP = infected premises; OA = outside area; POR = premises of relevance; RA = restricted area; SP = suspect premises; SpP = special permit; TP = trace premises; ZP = zero susceptible species premises

**Notes for Table 6.6**

**SpP6 conditions:**
- After a minimum of 7 days following depopulation.
- Only to a ZP (such as a broadacre farm) for use as fertiliser, or to a composting facility.
- The material is not brought into direct or indirect contact with susceptible animals.
- Every precaution is taken to ensure that effluent, other fluids or aerosols do not leak out of the transport vehicle.
- Transport vehicle and containers are decontaminated under supervision between loads.
- Use of an approved transport route.

**GP5 conditions:**
- Only to a ZP (such as a broadacre farm) for use as fertiliser, or to a composting facility.
- The material is not brought into direct or indirect contact with susceptible animals.
- Every precaution is taken to ensure that effluent, other fluids or aerosols do not leak out of the transport vehicle.
- Transport vehicle and containers are decontaminated between loads.
6.4.5 Empty livestock transport vehicles and associated equipment

Aujeszky's disease virus does not survive for long periods in the environment and can be readily killed with detergents; therefore, routine decontamination of vehicles is sufficient to reduce the risk of virus spread.

Table 6.7 shows the recommended movement controls for empty pig transport vehicles and associated equipment within and between declared areas.

Table 6.7  Recommended movement controls for empty pig transport vehicles and equipment

<table>
<thead>
<tr>
<th>To→</th>
<th>RA</th>
<th>CA</th>
<th>OA</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RA</td>
<td>Prohibited, except under SpP7</td>
<td>Prohibited, except under SpP7</td>
<td>Prohibited, except under SpP7</td>
</tr>
<tr>
<td>CA</td>
<td>Prohibited, except under GP6</td>
<td>Prohibited, except under GP6</td>
<td>Prohibited, except under GP6</td>
</tr>
<tr>
<td>OA</td>
<td>Allowed</td>
<td>Allowed</td>
<td>Allowed</td>
</tr>
</tbody>
</table>

CA = control area; GP = general permit; OA = outside area; RA = restricted area; SpP = special permit

Notes for Table 6.7

SpP7 conditions:
- Vehicles that have carried pigs and equipment that has been used with pigs are appropriately decontaminated as soon as possible after use, at an appropriate site (eg truck wash-down facility at an abattoir), and are dry before reuse.

GP6 conditions:
- Vehicles that have carried pigs and equipment that has been used with pigs are appropriately decontaminated as soon as possible after use, at an appropriate site (eg truck wash-down facility at an abattoir), and are dry before reuse.

6.4.6 People and nonsusceptible animals

The movement of people is restricted to essential visitors who use protective clothing, including boots, on the premises (including between sections containing pigs of different health status) and decontaminate their hands before leaving the premises.

6.4.7 Crops, grains, hay, silage and mixed feeds

Before movement, stored grain should be sieved to detect rodents or cats that may have died from Aujeszky's disease.
6.4.8 Sales, shows and other events

Events such as sales and shows are prohibited if pigs are involved. The hunting of feral pigs should be actively discouraged during a response to Aujeszky's disease.
7 Procedures for surveillance and proof of freedom

The importance for trade of proof of freedom is less for Aujeszky's disease than for some other diseases. Evidence of freedom, which comprises serological testing of previously infected herds, in-contact herds, herds with stock movements from the infected premises (IP), and other pig herds within a 5-km radius of the previously infected premises, will be collected at least 6 months after the pivotal property was determined free from the disease. Conducting a national survey would be resource intensive, but some surveys outside the area defined above would be necessary to substantiate free status.

The number of animals to be serologically tested depends on the circumstances of the particular herd. A herd that was on an IP and is undergoing test-and-removal procedures will have all breeding stock tested periodically. A dangerous contact premises (DCP) will have animals tested that are directly related (by way of movements) to an IP. In addition, a sample of animals sufficient to detect a 5% prevalence of Aujeszky's disease with a 95% confidence would need to be tested. Depending on resources and the number of herds involved, this may entail testing all breeding animals in the DCP. Further proof of freedom would include sampling a proportion of culled sows and boars from the restricted area or state.

The OIE Terrestrial Code recommends that the importation of breeding pigs be allowed from countries not free from Aujeszky's disease, under certain conditions. Certification of the absence of clinical, virological or serological evidence of Aujeszky's disease, that the animals had been kept exclusively in Aujeszky's disease-free establishments, and serological testing and isolation of the animals are considered satisfactory. The OIE Terrestrial Code recommends that the importation of meat from animals slaughtered in an abattoir and found to pass health inspections before and after slaughter be allowed.
8 Appendix 1

AVAILABLE VACCINES

Vaccination is an integral part of the control and eradication strategy. The recommended vaccine is a gene-deleted vaccine that meets OIE specifications (OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals). Gene-deleted vaccines used at a national level must be restricted to one type — for example, glycoprotein I (gE)-deleted vaccine — for which an ELISA (enzyme-linked immunosorbent assay) test is carried out by CSIRO-AAHL (CSIRO Australian Animal Health Laboratory).
9  Glossary

9.1  Disease-specific terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>All-in-all-out production</td>
<td>A method of production in which all stock leave the premises (or area), followed by total restocking.</td>
</tr>
<tr>
<td>Encephalomyelitis</td>
<td>Inflammation of the brain and spinal nerves.</td>
</tr>
<tr>
<td>Glial cells</td>
<td>Supporting cells of the brain and spinal cord.</td>
</tr>
<tr>
<td>Glycoproteins</td>
<td>Surface antigenic proteins of a microorganism.</td>
</tr>
<tr>
<td>Rendering</td>
<td>Processing by heat to inactivate infective agents. Rendered material may be used in various products according to particular disease circumstances.</td>
</tr>
<tr>
<td>Salvage</td>
<td>Recovery of some (but not full) market value by treatment and use of products, according to disease circumstances.</td>
</tr>
<tr>
<td>Serosurveillance</td>
<td>Surveillance of an animal population by testing serum samples for the presence of antibodies to disease agents.</td>
</tr>
<tr>
<td>Serum neutralisation test</td>
<td>A serological test to detect and measure the presence of antibody in a sample. Antibody in serum is serially diluted to detect the highest dilution that neutralises a standard amount of antigen. The neutralising antibody titre is given as the reciprocal of this dilution.</td>
</tr>
<tr>
<td>Suppurative</td>
<td>Discharging pus.</td>
</tr>
</tbody>
</table>

9.2  Standard AUSVETPLAN terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal byproducts</td>
<td>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).</td>
</tr>
<tr>
<td>Animal Health Committee</td>
<td>A committee whose members are the Australian and state and territory CVOs, the Director of the CSIRO Australian Animal Health Laboratory, and the Director of Environmental Biosecurity in the Australian Government Department of the Environment. The committee provides advice to the National Biosecurity Committee on animal health matters, focusing on technical issues and regulatory policy (formerly called the Veterinary Committee). See also National Biosecurity Committee</td>
</tr>
<tr>
<td>Animal products</td>
<td>Meat, meat products and other products of animal origin (eg eggs, milk) for human consumption or for use in animal feedstuff.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
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</tr>
<tr>
<td>Approved processing facility (APF)</td>
<td>An abattoir, knackery, milk processing plant or other such facility that maintains increased biosecurity standards. Such a facility could have animals or animal products introduced from lower risk premises under a permit for processing to an approved standard.</td>
</tr>
<tr>
<td>At-risk premises (ARP)</td>
<td>A premises in a restricted area that contains a live susceptible animal(s) but is not considered at the time of classification to be an infected premises, dangerous contact premises, dangerous contact processing facility, suspect premises or trace premises.</td>
</tr>
<tr>
<td>Australian Chief Veterinary Officer</td>
<td>The nominated senior veterinarian in the Australian Government Department of Agriculture and Water Resources who manages international animal health commitments and the Australian Government’s response to an animal disease outbreak. See also Chief veterinary officer</td>
</tr>
<tr>
<td>AUSVETPLAN</td>
<td>Australian Veterinary Emergency Plan. 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.</td>
</tr>
<tr>
<td>Chief veterinary officer (CVO)</td>
<td>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. See also Australian Chief Veterinary Officer</td>
</tr>
<tr>
<td>Compartmentalisation</td>
<td>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.</td>
</tr>
<tr>
<td>Compensation</td>
<td>The sum of money paid by government to an owner for livestock or property that are destroyed for the purpose of eradication or prevention of the spread of an emergency animal disease, and livestock that have died of the emergency animal disease. See also Cost-sharing arrangements, Emergency Animal Disease Response Agreement</td>
</tr>
<tr>
<td>Consultative Committee on Emergency Animal Diseases (CCEAD)</td>
<td>The key technical coordinating body for animal health emergencies. Members are state and territory CVOs, representatives of CSIRO-AAHL and the relevant industries, and the Australian CVO as chair.</td>
</tr>
<tr>
<td>Control area (CA)</td>
<td>A legally declared area where the disease controls, including surveillance and movement controls, applied 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 incident according to need).</td>
</tr>
<tr>
<td>Cost-sharing arrangements</td>
<td>Arrangements agreed between governments (national and states/territories) and livestock industries for sharing the costs of emergency animal disease responses. See also Compensation, Emergency Animal Disease Response Agreement</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
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<tr>
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</tr>
<tr>
<td>Dangerous contact animal</td>
<td>A susceptible animal that has been designated as being exposed to other infected animals or potentially infectious products following tracing and epidemiological investigation.</td>
</tr>
<tr>
<td>Dangerous contact premises (DCP)</td>
<td>A premises, apart from an abattoir, knackery or milk processing plant (or other such facility), that, after investigation and based on a risk assessment, is considered to contain a susceptible animal(s) not showing clinical signs, but considered highly likely to contain an infected animal(s) and/or contaminated animal products, wastes or things that present an unacceptable risk to the response if the risk is not addressed, and that therefore requires action to address the risk.</td>
</tr>
<tr>
<td>Dangerous contact processing facility (DCPF)</td>
<td>An abattoir, knackery, milk processing plant or other such facility that, based on a risk assessment, appears highly likely to have received infected animals, or contaminated animal products, wastes or things, and that requires action to address the risk.</td>
</tr>
<tr>
<td>Declared area</td>
<td>A defined tract of land that is subjected to disease control restrictions under emergency animal disease legislation. There are two types of declared areas: restricted area and control area.</td>
</tr>
<tr>
<td>Decontamination</td>
<td>Includes all stages of cleaning and disinfection.</td>
</tr>
<tr>
<td>Depopulation</td>
<td>The removal of a host population from a particular area to control or prevent the spread of disease.</td>
</tr>
<tr>
<td>Destroy (animals)</td>
<td>To kill animals humanely.</td>
</tr>
<tr>
<td>Disease agent</td>
<td>A general term for a transmissible organism or other factor that causes an infectious disease.</td>
</tr>
<tr>
<td>Disease Watch Hotline</td>
<td>24-hour freecall service for reporting suspected incidences of exotic diseases — <strong>1800 675 888</strong>.</td>
</tr>
<tr>
<td>Disinfectant</td>
<td>A chemical used to destroy disease agents outside a living animal.</td>
</tr>
<tr>
<td>Disinfection</td>
<td>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.</td>
</tr>
<tr>
<td>Disinsectisation</td>
<td>The destruction of insect pests, usually with a chemical agent.</td>
</tr>
<tr>
<td>Disposal</td>
<td>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.</td>
</tr>
<tr>
<td>Emergency animal disease</td>
<td>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. See also Endemic animal disease, Exotic animal disease</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
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<tr>
<td>Emergency Animal Disease Response Agreement</td>
<td>Agreement between the Australian and state/territory governments and livestock industries on the management of emergency animal disease responses. Provisions include participatory decision making, risk management, cost sharing, the use of appropriately trained personnel and existing standards such as AUSVETPLAN. <em>See also</em> Compensation, Cost-sharing arrangements</td>
</tr>
<tr>
<td>Endemic animal disease</td>
<td>A disease affecting animals (which may include humans) that is known to occur in Australia. <em>See also</em> Emergency animal disease, Exotic animal disease</td>
</tr>
<tr>
<td>Enterprise</td>
<td><em>See</em> Risk enterprise</td>
</tr>
<tr>
<td>Enzyme-linked immunosorbent assay (ELISA)</td>
<td>A serological test designed to detect and measure the presence of antibody or antigen in a sample. The test uses an enzyme reaction with a substrate to produce a colour change when antigen–antibody binding occurs.</td>
</tr>
<tr>
<td>Epidemiological investigation</td>
<td>An investigation to identify and qualify the risk factors associated with the disease. <em>See also</em> Veterinary investigation</td>
</tr>
<tr>
<td>Epidemiology</td>
<td>The study of disease in populations and of factors that determine its occurrence.</td>
</tr>
<tr>
<td>Exotic animal disease</td>
<td>A disease affecting animals (which may include humans) that does not normally occur in Australia. <em>See also</em> Emergency animal disease, Endemic animal disease</td>
</tr>
<tr>
<td>Exotic fauna/feral animals</td>
<td>*See Wild animals</td>
</tr>
<tr>
<td>Fomites</td>
<td>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.</td>
</tr>
<tr>
<td>General permit</td>
<td>A legal document that describes the requirements for movement of an animal (or group of animals), commodity or thing, for which permission may be granted without the need for direct interaction between the person moving the animal(s), commodity or thing and a government veterinarian or inspector. The permit may be completed via a webpage or in an approved place (such as a government office or commercial premises). A printed version of the permit must accompany the movement. The permit may impose preconditions and/or restrictions on movements. <em>See also</em> Special permit</td>
</tr>
<tr>
<td>In-contact animals</td>
<td>Animals that have had close contact with infected animals, such as noninfected animals in the same group as infected animals.</td>
</tr>
<tr>
<td>Incubation period</td>
<td>The period that elapses between the introduction of the pathogen into the animal and the first clinical signs of the disease.</td>
</tr>
<tr>
<td>Index case</td>
<td>The first case of the disease to be diagnosed in a disease outbreak. <em>See also</em> Index property</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
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</tr>
<tr>
<td>Index property</td>
<td>The property on which the index case is found. See also Index case</td>
</tr>
<tr>
<td>Infected premises (IP)</td>
<td>A defined area (which may be all or part of a property) on which animals meeting the case definition are or were present, or the causative agent of the emergency animal disease is present, or there is a reasonable suspicion that either is present, and that the relevant chief veterinary officer or their delegate has declared to be an infected premises.</td>
</tr>
<tr>
<td>Local control centre (LCC)</td>
<td>An emergency operations centre responsible for the command and control of field operations in a defined area.</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Routine collection of data for assessing the health status of a population or the level of contamination of a site for remediation purposes. See also Surveillance</td>
</tr>
<tr>
<td>Movement control</td>
<td>Restrictions placed on the movement of animals, people and other things to prevent the spread of disease.</td>
</tr>
<tr>
<td>National Biosecurity Committee (NBC)</td>
<td>The NBC was formally established under the Intergovernmental Agreement on Biosecurity (IGAB). The IGAB was signed on 13 January 2012, and signatories include all states and territories except Tasmania. The NBC provides advice to the Agriculture Senior Officials Committee and the Agriculture Ministers’ Forum on national biosecurity issues, and on the IGAB.</td>
</tr>
<tr>
<td>National management group (NMG)</td>
<td>A group established to approve (or not approve) the invoking of cost sharing under the Emergency Animal Disease Response Agreement. NMG members are the Secretary of the Australian Government Department of Agriculture and Water Resources as chair, the chief executive officers of the state and territory government parties, and the president (or analogous officer) of each of the relevant industry parties.</td>
</tr>
<tr>
<td>Native wildlife</td>
<td>See Wild animals</td>
</tr>
<tr>
<td>Operational procedures</td>
<td>Detailed instructions for carrying out specific disease control activities, such as disposal, destruction, decontamination and valuation.</td>
</tr>
<tr>
<td>Outside area (OA)</td>
<td>The area of Australia outside the declared (control and restricted) areas.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
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</tr>
<tr>
<td>Owner</td>
<td>Person responsible for a premises (includes an agent of the owner, such as a manager or other controlling officer).</td>
</tr>
<tr>
<td>Polymerase chain reaction (PCR)</td>
<td>A method of amplifying and analysing DNA sequences that can be used to detect the presence of viral DNA.</td>
</tr>
<tr>
<td>Premises</td>
<td>A tract of land including its buildings, or a separate farm or facility that is maintained by a single set of services and personnel.</td>
</tr>
<tr>
<td>Premises of relevance (POR)</td>
<td>A premises in a control area that contains a live susceptible animal(s) but is considered at the time of classification not to be an infected premises, suspect premises, trace premises, dangerous contact premises or dangerous contact processing facility.</td>
</tr>
<tr>
<td>Prevalence</td>
<td>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.</td>
</tr>
<tr>
<td>Primary case</td>
<td>The first actual case of the disease.</td>
</tr>
<tr>
<td>Quarantine</td>
<td>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.</td>
</tr>
<tr>
<td>Resolved premises (RP)</td>
<td>An infected premises, dangerous contact premises or dangerous contact processing facility that has completed the required control measures and is subject to the procedures and restrictions appropriate to the area in which it is located.</td>
</tr>
<tr>
<td>Restricted area (RA)</td>
<td>A relatively small legally declared area around infected premises and dangerous contact premises that is subject to disease controls, including intense surveillance and movement controls.</td>
</tr>
<tr>
<td>Risk enterprise</td>
<td>A defined livestock or related enterprise that 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.</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>The proportion of truly positive units that are correctly identified as positive by a test. See also Specificity</td>
</tr>
<tr>
<td>Sentinel animal</td>
<td>Animal of known health status that is monitored to detect the presence of a specific disease agent.</td>
</tr>
<tr>
<td>Seroconversion</td>
<td>The appearance in the blood serum of antibodies (as determined by a serology test) following vaccination or natural exposure to a disease agent.</td>
</tr>
<tr>
<td>Serosurveillance</td>
<td>Surveillance of an animal population by testing serum samples for the presence of antibodies to disease agents.</td>
</tr>
<tr>
<td>Serotype</td>
<td>A subgroup of microorganisms identified by the antigens carried (as determined by a serology test).</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
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</tr>
<tr>
<td>Serum neutralisation test</td>
<td>A serological test to detect and measure the presence of antibody in a sample. Antibody in serum is serially diluted to detect the highest dilution that neutralises a standard amount of antigen. The neutralising antibody titre is given as the reciprocal of this dilution.</td>
</tr>
<tr>
<td>Slaughter</td>
<td>The humane killing of an animal for meat for human consumption.</td>
</tr>
<tr>
<td>Special permit</td>
<td>A legal document that describes the requirements for movement of an animal (or group of animals), commodity or thing, for which the person moving the animal(s), commodity or thing must obtain prior written permission from the relevant government veterinarian or inspector. A printed version of the permit must accompany the movement. The permit may impose preconditions and/or restrictions on movements. See also General permit</td>
</tr>
<tr>
<td>Specificity</td>
<td>The proportion of truly negative units that are correctly identified as negative by a test. See also Sensitivity</td>
</tr>
<tr>
<td>Stamping out</td>
<td>The strategy of eliminating infection from premises through the destruction of animals in accordance with the particular AUSVETPLAN manual, and in a manner that permits appropriate disposal of carcasses and decontamination of the site.</td>
</tr>
<tr>
<td>State coordination centre (SCC)</td>
<td>The emergency operations centre that directs the disease control operations to be undertaken in that state or territory.</td>
</tr>
<tr>
<td>Surveillance</td>
<td>A systematic program of investigation designed to establish the presence, extent 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.</td>
</tr>
<tr>
<td>Susceptible animals</td>
<td>Animals that can be infected with a particular disease.</td>
</tr>
<tr>
<td>Suspect animal</td>
<td>An animal that may have been exposed to an emergency disease such that its quarantine and intensive surveillance, but not preemptive slaughter, is warranted.</td>
</tr>
<tr>
<td></td>
<td>An animal not known to have been exposed to a disease agent but showing clinical signs requiring differential diagnosis.</td>
</tr>
<tr>
<td>Suspect premises (SP)</td>
<td>Temporary classification of a premises that contains a susceptible animal(s) not known to have been exposed to the disease agent but showing clinical signs similar to the case definition, and that therefore requires investigation(s).</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
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</tr>
<tr>
<td>Swill</td>
<td>Also known as 'prohibited pig feed', material of mammalian origin, or any substance that has come in contact with this material; it does not include: • milk, milk products or milk byproducts, either of Australian provenance or legally imported for stockfeed use into Australia • material containing flesh, bones, blood, offal or mammal carcases that is treated by an approved process¹⁵ • a carcass or part of a domestic pig, born and raised on the property on which the pig or pigs that are administered the part are held, that is administered for therapeutic purposes in accordance with the written instructions of a veterinary practitioner • material used under an individual and defined-period permit issued by a jurisdiction for the purposes of research or baiting. This definition was endorsed by the Agricultural Ministers' Council through AGMIN OOS 04/2014.</td>
</tr>
<tr>
<td>Swill feeding</td>
<td>Also known as 'feeding prohibited pig feed', includes: • feeding, or allowing or directing another person to feed, prohibited pig feed to a pig • allowing a pig to have access to prohibited pig feed • the collection and storage or possession of prohibited pig feed on a premises where one or more pigs are kept • supplying to another person prohibited pig feed that the supplier knows is for feeding to any pig. This definition was endorsed by the Agricultural Ministers' Council through AGMIN OOS 04/2014.</td>
</tr>
<tr>
<td>Trace premises (TP)</td>
<td>Temporary classification of a premises that contains susceptible animal(s) that tracing indicates may have been exposed to the disease agent, or contains contaminated animal products, wastes or things, and that requires investigation(s).</td>
</tr>
<tr>
<td>Tracing</td>
<td>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.</td>
</tr>
<tr>
<td>Unknown status premises (UP)</td>
<td>A premises within a declared area where the current presence of susceptible animals and/or risk products, wastes or things is unknown.</td>
</tr>
<tr>
<td>Vaccination</td>
<td>Inoculation of individuals with a vaccine to provide active immunity.</td>
</tr>
</tbody>
</table>

¹⁵ Refer to jurisdictional legislation for approved processes. Jurisdictions may have approved processes that meet the following minimum standards: rendering in accordance with the Australian Standard for the Hygienic Rendering of Animal Products; under jurisdictional permit, cooking processes subject to compliance verification that ensure that an internal temperature of at least 70 °C for a minimum of 30 minutes, or equivalent, has been reached; treatment of cooking oil that has been used for cooking in Australia in accordance with the National Standard for Recycling of Used Cooking Fats and Oils Intended for Animal Feeds; under jurisdictional permit, any other nationally agreed process approved by AHC for which an acceptable risk assessment has been undertaken and that is subject to compliance verification.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaccine</td>
<td>A substance used to stimulate immunity against one or several disease-causing agents to provide protection or to reduce the effects of the disease. A vaccine is prepared from the causative agent of a disease, its products, or a synthetic substitute, which is treated to act as an antigen without inducing the disease.</td>
</tr>
<tr>
<td>– adjuvanted</td>
<td>A vaccine in which one or several disease-causing agents are combined with an adjuvant (a substance that increases the immune response).</td>
</tr>
<tr>
<td>– attenuated</td>
<td>A vaccine prepared from infective or 'live' microbes that are less pathogenic but retain their ability to induce protective immunity.</td>
</tr>
<tr>
<td>– gene deleted</td>
<td>An attenuated or inactivated vaccine in which genes for non-essential surface glycoproteins have been removed by genetic engineering. This provides a useful immunological marker for the vaccine virus compared with the wild virus.</td>
</tr>
<tr>
<td>– inactivated</td>
<td>A vaccine prepared from a virus that has been inactivated ('killed') by chemical or physical treatment.</td>
</tr>
<tr>
<td>– recombinant</td>
<td>A vaccine produced from virus that has been genetically engineered to contain only selected genes, including those causing the immunogenic effect.</td>
</tr>
<tr>
<td>Vector</td>
<td>A living organism (frequently an arthropod) that transmits an infectious agent from one host to another. A biological vector is one in which the infectious agent must develop or multiply before becoming infective to a recipient host. A mechanical vector is one that transmits an infectious agent from one host to another but is not essential to the life cycle of the agent.</td>
</tr>
</tbody>
</table>
| Veterinary investigation | An investigation of the diagnosis, pathology and epidemiology of the disease.  
**See also** Epidemiological investigation |
| Viraemia            | The presence of viruses in the blood.                                                                                                           |
| Wild animals       |                                                                                                                                               |
| – native wildlife  | Animals that are indigenous to Australia and may be susceptible to emergency animal diseases (eg bats, dingoes, marsupials).                  |
| – feral animals    | Animals of domestic species that are not confined or under control (eg cats, horses, pigs).                                                    |
| – exotic fauna     | Nondomestic animal species that are not indigenous to Australia (eg foxes).                                                                   |
| Zero susceptible species premises (ZP) | A premises that does not contain any susceptible animals or risk products, wastes or things.                                                  |
| 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.                                                                                      |
## 10 Abbreviations

### 10.1 Disease-specific abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNS</td>
<td>central nervous system</td>
</tr>
<tr>
<td>gE</td>
<td>glycoprotein I</td>
</tr>
</tbody>
</table>

### 10.2 Standard AUSVETPLAN abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full title</th>
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</thead>
<tbody>
<tr>
<td>AAHL</td>
<td>Australian Animal Health Laboratory</td>
</tr>
<tr>
<td>AN</td>
<td>assessed negative</td>
</tr>
<tr>
<td>APF</td>
<td>approved processing facility</td>
</tr>
<tr>
<td>ARP</td>
<td>at-risk premises</td>
</tr>
<tr>
<td>AUSVETPLAN</td>
<td>Australian Veterinary Emergency Plan</td>
</tr>
<tr>
<td>CA</td>
<td>control area</td>
</tr>
<tr>
<td>CCEAD</td>
<td>Consultative Committee on Emergency Animal Diseases</td>
</tr>
<tr>
<td>CSIRO</td>
<td>Commonwealth Scientific and Industrial Research Organisation</td>
</tr>
<tr>
<td>CVO</td>
<td>chief veterinary officer</td>
</tr>
<tr>
<td>DCP</td>
<td>dangerous contact premises</td>
</tr>
<tr>
<td>DCPF</td>
<td>dangerous contact processing facility</td>
</tr>
<tr>
<td>EAD</td>
<td>emergency animal disease</td>
</tr>
<tr>
<td>EADRA</td>
<td>Emergency Animal Disease Response Agreement</td>
</tr>
<tr>
<td>EADR1P</td>
<td>Emergency Animal Disease Response Plan</td>
</tr>
<tr>
<td>EDTA</td>
<td>ethylenediaminetetraacetic acid (anticoagulant for whole blood)</td>
</tr>
<tr>
<td>ELISA</td>
<td>enzyme-linked immunosorbent assay</td>
</tr>
<tr>
<td>GP</td>
<td>general permit</td>
</tr>
<tr>
<td>IETS</td>
<td>International Embryo Transfer Society</td>
</tr>
<tr>
<td>IP</td>
<td>infected premises</td>
</tr>
<tr>
<td>LCC</td>
<td>local control centre</td>
</tr>
<tr>
<td>NASOP</td>
<td>nationally agreed standard operating procedure</td>
</tr>
<tr>
<td>NMG</td>
<td>National Management Group</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Full title</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------------------</td>
</tr>
<tr>
<td>OA</td>
<td>outside area</td>
</tr>
<tr>
<td>OIE</td>
<td>World Organisation for Animal Health</td>
</tr>
<tr>
<td>PCR</td>
<td>polymerase chain reaction</td>
</tr>
<tr>
<td>POR</td>
<td>premises of relevance</td>
</tr>
<tr>
<td>RA</td>
<td>restricted area</td>
</tr>
<tr>
<td>RP</td>
<td>resolved premises</td>
</tr>
<tr>
<td>SCC</td>
<td>state coordination centre</td>
</tr>
<tr>
<td>SP</td>
<td>suspect premises</td>
</tr>
<tr>
<td>SpP</td>
<td>special permit</td>
</tr>
<tr>
<td>TP</td>
<td>trace premises</td>
</tr>
<tr>
<td>UP</td>
<td>unknown status premises</td>
</tr>
<tr>
<td>ZP</td>
<td>zero susceptible species premises</td>
</tr>
</tbody>
</table>
11 References


Aujeszky's disease


### 11.1 Further reading


11.2 Training resources

See the Overview Document for a full list of training resources.