

AUSTRALIAN VETERINARY EMERGENCY PLAN

AUSVETPLAN

Response policy brief

Influenza A viruses in swine

Version 4.0, 2018

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

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DISEASE WATCH HOTLINE: 1800 675 888

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

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1 Introduction

1.1 Scope of this manual

This response policy brief for the management of an outbreak of an influenza A virus in swine¹ 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).

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.

The strategies and policy guidelines are for emergency situations and are not applicable to quarantine policies for imported livestock or livestock products.

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.²

Table 1.1 AUSVETPLAN documents

Document type	Manuals
Overview document	Background information about AUSVETPLAN rationale, development and maintenance
Disease strategies	Individual disease and policy information for most of the diseases listed in the EADRA
Response policy briefs	Summary disease and policy information for each EADRA disease not covered by individual disease strategies (see above)
Operational manuals	Decontamination
	Destruction of animals
	Disposal

¹ In this document, this disease is referred to as 'influenza A viruses in swine', for consistency with the terminology in the Australian national list of notifiable diseases of terrestrial animals (see www.agriculture.gov.au/pests-diseases-weeds/animal/notifiable). However, 'swine' are otherwise referred to as 'pigs' throughout this document.

² www.animalhealthaustralia.com.au/what-we-do/emergency-animal-disease/ausvetplan

Document type	Manuals
	Livestock welfare and management
	Valuation and compensation
	Wild animal response
Enterprise manuals	Artificial breeding centres
	Feedlots
	Meat processing
	Saleyards and transport
	Pig industry
	Poultry industry
	Wool industry
	Zoos
Management manuals	Control centres management (Parts 1 and 2)
	Laboratory preparedness
Outbreak manuals	Collations of individual disease, operational and enterprise information for use in an emergency disease outbreak

EADRA³ = *Government and Livestock Industry Cost Sharing Deed in Respect of Emergency Animal Disease Responses*

1.3 Nationally agreed standard operating procedures

Nationally agreed standard operating procedures (NASOPs)⁴ 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 Training resources

The EAD Foundation Online course⁵ provides livestock producers, veterinarians, veterinary students, government personnel and emergency workers with foundation knowledge for further training in EAD preparedness and response in Australia.

³ www.animalhealthaustralia.com.au/what-we-do/emergency-animal-disease/ead-response-agreement

⁴ www.animalhealthaustralia.com.au/what-we-do/emergency-animal-disease/nationally-agreed-standard-operating-procedures

⁵ <https://www.animalhealthaustralia.com.au/emergency-animal-disease-training-program>

2 Nature of the disease

Influenza A viruses can cause an acute, highly contagious disease of the respiratory tract of pigs.

2.1 Case definition

For the purposes of this response policy brief, a case of influenza A virus in swine is defined as laboratory-confirmed infection with an influenza A virus in one or more pigs.

At the time of an outbreak, revised or subsequent case definitions may be developed, with the agreement of the Consultative Committee on Emergency Animal Diseases.

2.2 Nature of the disease

The World Organisation for Animal Health (OIE) does not include influenza A viruses in swine on its list of notifiable diseases.

2.2.1 Aetiology

Influenza A viruses of the family *Orthomyxoviridae* can infect a wide variety of animal species.

These viruses are constantly evolving genetically and have the ability to form new subtypes, possibly with alterations in characteristics such as virulence, infectivity and host range. The three subtypes usually associated with disease in pigs are H1N1, H1N2 and H3N2, and multiple strains are recognised within these subtypes. Occasional outbreaks have been linked to other subtypes, including H4N6, H6N6, H4N8, H5N1, H7N6 and H9N2, but these subtypes have not become established in pig populations (Vincent et al 2014).

Pigs may also be infected by influenza viruses from other species, particularly humans and birds. In 2009, a novel H1N1 virus (H1N1pdm09) emerged in humans in North America, rapidly establishing as a worldwide pandemic. This virus was based on a triple reassortment internal gene (TRIG⁶) backbone with two genes derived from Eurasian swine viruses. It transfers readily between humans and pigs (Deng et al 2012), and became established in pig populations worldwide (Brookes et al 2010). H1N1pdm09 appears to retain the TRIG predilection for reassortment, and derived sublineages have been documented in a number of countries.

2.2.2 Susceptible species

Although influenza A viruses in general may infect a wide range of species, pig-adapted strains circulate predominantly in pigs. Infection of humans with these viruses occurs sporadically but not uncommonly. Disease associated with some pig-adapted influenza A viruses has been reported in turkeys, ferrets and mink; occasion infection of other animals (particularly ducks and dogs) has also been documented (Spickler 2016).

⁶ The TRIG cassette (or backbone) refers to gene segments derived from swine, avian and human viruses, as first identified in 1998 triple reassortant H3N2 viruses.

2.2.3 World distribution and occurrence in Australia

Influenza A viruses are considered ubiquitous in pig populations worldwide (OIE 2009).

Influenza A viruses have been detected in Australian pig populations but have not been associated with significant production or public health issues.

2.2.4 Epidemiology

The incubation period for influenza A viruses in pigs is usually 1–3 days. Pigs begin excreting virus within 24 hours of infection and may shed virus for 7–10 days (OIE 2009), although peak shedding occurs around 48–72 hours. Virus replication is mainly restricted to epithelial cells in the respiratory tract, and shedding is mainly through the nasopharyngeal route. Oral and ocular shedding may occur intermittently, but neither faecal shedding nor viraemia have been seen in naturally occurring influenza A virus infection.

Within herds, influenza A viruses are primarily transmitted among pigs in close contact through nasal discharges, and aerosols from sneezing and coughing.

Between herds, the main method of spread of influenza A virus is through the movement of infected pigs. Influenza A virus may also be spread on contaminated fomites such as equipment. Live virus and viral antigens have not been detected in meat or viscera (Brookes et al 2010, Vincent et al 2010). Therefore, it would be highly unlikely that known influenza A viruses could be transmitted in pork or pork products.

Humans and birds may also be a source of infection for pigs, and pigs for humans and birds.

Pigs naturally infected with influenza A virus develop protective immunity to challenge from the same subtype (Gramer 2009), but immunity is often short lived (6 months), and the immunity profile in a breeding herd may vary considerably over time. There is little evidence of a true long-term carrier state in pigs (OIE 2009).

Whether an influenza A virus becomes endemic within a pig herd will depend on factors such as agent infectivity, the number and susceptibility of naive pigs, and pig density. Farrow-to-finish operations are likely to be at higher risk because infection is maintained during the regular farrowing of sows within a herd, which maintains a population of naive animals. 'Open' herds (where live pigs are purchased from external sources), populations with considerable movement between groups and a higher rate of contact, and populations with pigs at higher stocking rates are more likely to maintain infection. Commercial herds are most at risk in this respect, especially larger herd operations. Large herds, with separation of animal buildings and separate air spaces, are likely to create pockets of infected and naive animals, further adding to the risk of persistence. Annual outbreaks are likely to occur within affected herds during the colder months.

Mammalian influenza viruses seem to be relatively labile but can persist for several hours in dried mucus. They can be inactivated by heating at 56 °C for a minimum of 60 minutes (or higher temperatures for shorter periods) and by low pH (pH 2) (OIE 2009). The inactivation time for some pig influenza viruses in slurry kept at different temperatures was 9 weeks at 5 °C, 2 weeks at 20 °C, and more than 24 hours at 35 °C (Bøtner 1990). Therefore, virus could survive in slurry for a considerable period, particularly at cool temperatures.

Influenza A viruses are susceptible to soaps and a wide variety of disinfectants, including sodium hypochlorite, 70% ethanol, oxidising agents, quaternary ammonium compounds, aldehydes

(formalin, glutaraldehyde, formaldehyde), phenols, acids, povidone–iodine and lipid solvents (OIE 2009).

2.2.5 Diagnostic criteria

In naive herds, infection with an influenza A virus typically presents as an acute to chronic respiratory disease. Infected pigs may show fever, anorexia, weight loss, coughing, sneezing, nasal discharge and respiratory difficulty. Infection can also occur with no clinical signs. An early sign in commercial piggeries is a fall in feed consumption. Influenza A virus may cause reproductive problems in sows, depending on the stage of gestation at infection. Although all pigs in a herd may become sick, case mortality ratios are generally low (1–3%), and, in the absence of complications, most affected pigs recover within 5–7 days. Severe bronchopneumonia may develop as a complication and is a high risk factor for mortality.

When influenza A is endemic in a pig herd, there may be intermittent bouts of disease and infertility. Different subtypes of influenza A virus may sequentially infect the herd.

A confirmed diagnosis requires detection of an influenza A virus in pigs by polymerase chain reaction (PCR) or virus isolation. Genetic analysis is required to fully characterise the viral subtype. Serology is most useful as a surveillance tool; serological detection would require further investigation before an active infection could be confirmed.

Appropriate samples include nasal, oral or respiratory swabs from active clinical cases (preferably within 48 hours of the development of clinical signs)⁷ and serum samples from recovered cases.

For index case investigation, samples should be submitted to the state or territory government laboratory for exclusion testing and to the CSIRO Australian Animal Health Laboratory for confirmation.

2.2.6 Vaccination and/or treatment of infected animals

Vaccines to protect pigs against influenza A viruses are not currently available in Australia.

Pig vaccines against influenza A viruses that are manufactured overseas are typically produced locally and protect against strains that are circulating within that region. However, the antigenic and genetic make-up of circulating influenza A strains can differ dramatically, and it is not possible to manufacture a vaccine that will protect all animals, even within the same country. Furthermore, the composition of the various commercial vaccines (eg antigenic mass, adjuvants) can vary greatly. Commercial vaccines are inactivated whole-virus vaccines, with a potent adjuvant, based on H1N1 and/or H3N2 and/or H1N2 influenza A viruses from pigs (Richt and Webby 2013). Hence, it is likely that, in the event of an outbreak in Australia, vaccines from other parts of the world would be ineffective.

Treatment of affected herds is usually ineffective, although antimicrobial treatment is often used to lessen the impact of secondary bacterial infections. In countries where disease is endemic in pigs, vaccines, strict biosecurity and sound management practices are effective in reducing the impact of infection.

⁷ www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/docs/pdf/Disease_cards/SWINE_INFLUENZA.pdf

2.2.7 Public health implications

Influenza epidemiology in pigs involves a complex evolutionary integration of viruses from a number of species besides pigs, with human and avian viruses also part of this evolving assortment. There is evidence of interchange of influenza A viruses among pigs and other mammalian and avian hosts, either directly or after a process of genetic reassortment. This may be significant in the emergence of influenza A viruses pathogenic to humans, including those with pandemic potential. Because influenza A viruses in pigs are substantially derived from human seasonal viruses over many years, they represent a significant pool of gene segments known to be capable of replication in humans. This creates significant public health interest in understanding the dynamics of influenza A virus circulation in pigs.

The symptoms in humans infected with influenza A viruses from pigs resemble seasonal influenza — that is, fever, cough, sore throat and lethargy. Maintaining high-coverage seasonal influenza vaccination in humans at risk (such as piggery and abattoir workers, and transporters) may help to prevent transmission of influenza virus both from humans to pigs and from pigs to humans, therefore reducing opportunities for reassortment. This is best achieved through clear workplace policy, awareness raising and facilitated vaccination programs.

2.3 Principles of control and eradication

Good farm biosecurity and management practices are the most effective measures to prevent the introduction and spread of influenza A viruses. Virus may disappear from individual premises, particularly those that are all-in, all-out systems; however, the immunity acquired by recovered animals is short lived, making them susceptible to reinfection and disease if re-exposed.

3 Policy and rationale

Infection with influenza A viruses in swine⁸ 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*⁹ (EAD Response Agreement). When cost sharing of the eligible response costs of an incident is agreed, Category 4 diseases are those for which costs will be shared 20% by government and 80% by industry.

The policy for the response to an outbreak of influenza A virus in the Australian pig population will be determined by a risk assessment, taking into consideration, for example, how early the outbreak is detected, the extent of the outbreak, the location of affected premises, the subtype of virus involved and its zoonotic potential, the nature and severity of any clinical signs, and whether other respiratory pathogens that could complicate the clinical picture are present.

The risk assessment and development of control strategies will be undertaken by the relevant jurisdictional chief veterinary officer (CVO), in consultation with industry, private and/or government veterinarian(s), and other Australian governments, as appropriate. The jurisdictional CVO will collaborate with public health authorities when a zoonosis is suspected. No action will be required unless the risk assessment indicates an unacceptable threat to animal or public health.

- If a response is necessary, the control strategies implemented will be in line with the level of assessed risk:
 - If the assessed risk is low, the incident will be managed by the provision of advice to the affected producer(s) and consulting veterinarian(s) on monitoring animal health parameters and maintaining adequate biosecurity measures (including those to address workplace health and safety), in line with normal industry pig health practices.¹⁰
 - If the assessed risk is high, the incident will be managed, with the approval of the Consultative Committee on Emergency Animal Diseases, using some or all of the following
 - maintaining appropriate biosecurity on affected premises
 - appropriate workplace health and safety measures, with advice from human health authorities¹¹
 - tracing and surveillance to determine the source and extent of infection
 - where warranted, the use of declared areas and controls over high-risk movements of animals, people and things on affected premises to minimise the spread of infection
 - awareness-raising activities to encourage enhanced monitoring for changes in the health status of pigs and poultry on nearby properties, and reporting of any changes to the relevant authorities
 - industry support to increase understanding of the issues, facilitate cooperation, and address any animal welfare and on-farm biosecurity issues
 - a public awareness campaign.

⁸ The EAD Response Agreement currently lists 'swine influenza'; however, signatories are considering changing this to 'influenza A virus of swine'.

⁹ More information on the EAD Response Agreement is available at: <https://www.animalhealthaustralia.com.au/what-we-do/emergency-animal-disease/ead-response-agreement>.

¹⁰ This includes compliance with industry-accredited herd health plans, codes of practice for the transportation of pigs (such as *Model Code of Practice for the Welfare of Animals: Pigs* and *Australian Animal Welfare Standards and Guidelines: Land Transport of Livestock*).

¹¹ www.health.gov.au/internet/main/publishing.nsf/Content/cdnasongs.htm

- Vaccination of at-risk animals is unlikely to be used in an emergency response to an incident because a local, strain-specific vaccine would have to be developed.
- If an outbreak is considered unable to be contained or eradicated within an acceptable time, the policy for long-term management of the disease will be determined following consultation between government and the pig industry. The policy adopted may involve enhanced biosecurity, surveillance and vaccination under an industry program.

Glossary

Standard AUSVETPLAN terms

Term	Definition
Animal byproducts	Products of animal origin that are not for consumption but are destined for industrial use (eg hides and skins, fur, wool, hair, feathers, hooves, bones, fertiliser).
Animal Health Committee	A committee 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). <i>See also</i> National Biosecurity Committee
Animal products	Meat, meat products and other products of animal origin (eg eggs, milk) for human consumption or for use in animal feedstuff.
Approved processing facility (APF)	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.
At-risk premises (ARP)	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.
Australian Chief Veterinary Officer	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. <i>See also</i> Chief veterinary officer
AUSVETPLAN	<i>Australian Veterinary Emergency Plan</i> . A series of technical response plans that describe the proposed Australian approach to an emergency animal disease incident. The documents provide guidance based on sound analysis, linking policy, strategies, implementation, coordination and emergency-management plans.
Chief veterinary officer (CVO)	The senior veterinarian of the animal health authority in each jurisdiction (national, state or territory) who has responsibility for animal disease control in that jurisdiction. <i>See also</i> Australian Chief Veterinary Officer
Compartmentalisation	The process of defining, implementing and maintaining one or more disease-free establishments under a common biosecurity management system in accordance with OIE guidelines, based on applied biosecurity measures and surveillance, in order to facilitate disease control and/or trade.

Term	Definition
Compensation	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. <i>See also</i> Cost-sharing arrangements, Emergency Animal Disease Response Agreement
Consultative Committee on Emergency Animal Diseases (CCEAD)	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.
Control area (CA)	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).
Cost-sharing arrangements	Arrangements agreed between governments (national and states/territories) and livestock industries for sharing the costs of emergency animal disease responses. <i>See also</i> Compensation, Emergency Animal Disease Response Agreement
Dangerous contact animal	A susceptible animal that has been designated as being exposed to other infected animals or potentially infectious products following tracing and epidemiological investigation.
Dangerous contact premises (DCP)	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.
Dangerous contact processing facility (DCPF)	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.
Declared area	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.
Decontamination	Includes all stages of cleaning and disinfection.
Depopulation	The removal of a host population from a particular area to control or prevent the spread of disease.
Destroy (animals)	To kill animals humanely.
Disease agent	A general term for a transmissible organism or other factor that causes an infectious disease.
Disease Watch Hotline	24-hour freecall service for reporting suspected incidences of exotic diseases — 1800 675 888 .
Disinfectant	A chemical used to destroy disease agents outside a living animal.

Term	Definition
Disinfection	The application, after thorough cleansing, of procedures intended to destroy the infectious or parasitic agents of animal diseases, including zoonoses; applies to premises, vehicles and different objects that may have been directly or indirectly contaminated.
Disinsectisation	The destruction of insect pests, usually with a chemical agent.
Disposal	Sanitary removal of animal carcasses, animal products, materials and wastes by burial, burning or some other process so as to prevent the spread of disease.
Emergency animal disease	A disease that is (a) exotic to Australia or (b) a variant of an endemic disease or (c) a serious infectious disease of unknown or uncertain cause or (d) a severe outbreak of a known endemic disease, and that is considered to be of national significance with serious social or trade implications. <i>See also</i> Endemic animal disease, Exotic animal disease
Emergency Animal Disease Response Agreement	Agreement between the Australian and state/territory governments and livestock industries on the management of emergency animal disease responses. Provisions include participatory decision making, risk management, cost sharing, the use of appropriately trained personnel and existing standards such as AUSVETPLAN. <i>See also</i> Compensation, Cost-sharing arrangements
Endemic animal disease	A disease affecting animals (which may include humans) that is known to occur in Australia. <i>See also</i> Emergency animal disease, Exotic animal disease
Enterprise	<i>See</i> Risk enterprise
Enzyme-linked immunosorbent assay (ELISA)	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.
Epidemiological investigation	An investigation to identify and qualify the risk factors associated with the disease. <i>See also</i> Veterinary investigation
Epidemiology	The study of disease in populations and of factors that determine its occurrence.
Exotic animal disease	A disease affecting animals (which may include humans) that does not normally occur in Australia. <i>See also</i> Emergency animal disease, Endemic animal disease
Exotic fauna/feral animals	<i>See</i> Wild animals
Fomites	Inanimate objects (eg boots, clothing, equipment, instruments, vehicles, crates, packaging) that can carry an infectious disease agent and may spread the disease through mechanical transmission.

Term	Definition
General permit	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. <i>See also</i> Special permit
In-contact animals	Animals that have had close contact with infected animals, such as noninfected animals in the same group as infected animals.
Incubation period	The period that elapses between the introduction of the pathogen into the animal and the first clinical signs of the disease.
Index case	The first case of the disease to be diagnosed in a disease outbreak. <i>See also</i> Index property
Index property	The property on which the index case is found. <i>See also</i> Index case
Infected premises (IP)	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.
Local control centre (LCC)	An emergency operations centre responsible for the command and control of field operations in a defined area.
Monitoring	Routine collection of data for assessing the health status of a population or the level of contamination of a site for remediation purposes. <i>See also</i> Surveillance
Movement control	Restrictions placed on the movement of animals, people and other things to prevent the spread of disease.
National Biosecurity Committee (NBC)	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.
National management group (NMG)	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.
Native wildlife	<i>See</i> Wild animals

Term	Definition
OIE Terrestrial Code	OIE <i>Terrestrial Animal Health Code</i> . Describes standards for safe international trade in animals and animal products. Revised annually and published on the internet at: www.oie.int/international-standard-setting/terrestrial-code/access-online
OIE Terrestrial Manual	OIE <i>Manual of Diagnostic Tests and Vaccines for Terrestrial Animals</i> . Describes standards for laboratory diagnostic tests and the production and control of biological products (principally vaccines). The current edition is published on the internet at: www.oie.int/international-standard-setting/terrestrial-manual/access-online
Operational procedures	Detailed instructions for carrying out specific disease control activities, such as disposal, destruction, decontamination and valuation.
Outside area (OA)	The area of Australia outside the declared (control and restricted) areas.
Owner	Person responsible for a premises (includes an agent of the owner, such as a manager or other controlling officer).
Polymerase chain reaction (PCR)	A method of amplifying and analysing DNA sequences that can be used to detect the presence of viral DNA.
Premises	A tract of land including its buildings, or a separate farm or facility that is maintained by a single set of services and personnel.
Premises of relevance (POR)	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.
Prevalence	The proportion (or percentage) of animals in a particular population affected by a particular disease (or infection or positive antibody titre) at a given point in time.
Primary case	The first actual case of the disease.
Quarantine	Legal restrictions imposed on a place or a tract of land by the serving of a notice limiting access or egress of specified animals, persons or things.
Resolved premises (RP)	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.
Restricted area (RA)	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.

Term	Definition
Risk enterprise	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.
Sensitivity	The proportion of truly positive units that are correctly identified as positive by a test. <i>See also</i> Specificity
Sentinel animal	Animal of known health status that is monitored to detect the presence of a specific disease agent.
Seroconversion	The appearance in the blood serum of antibodies (as determined by a serology test) following vaccination or natural exposure to a disease agent.
Serosurveillance	Surveillance of an animal population by testing serum samples for the presence of antibodies to disease agents.
Serotype	A subgroup of microorganisms identified by the antigens carried (as determined by a serology test).
Serum neutralisation test	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.
Slaughter	The humane killing of an animal for meat for human consumption.
Special permit	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. <i>See also</i> General permit
Specificity	The proportion of truly negative units that are correctly identified as negative by a test. <i>See also</i> Sensitivity
Stamping out	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.
State coordination centre (SCC)	The emergency operations centre that directs the disease control operations to be undertaken in that state or territory.

Term	Definition
Surveillance	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.
Susceptible animals	Animals that can be infected with a particular disease.
Suspect animal	<p>An animal that may have been exposed to an emergency disease such that its quarantine and intensive surveillance, but not pre-emptive slaughter, is warranted.</p> <p><i>or</i></p> <p>An animal not known to have been exposed to a disease agent but showing clinical signs requiring differential diagnosis.</p>
Suspect premises (SP)	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).
Swill	<p>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:</p> <ul style="list-style-type: none"> • 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 carcasses that is treated by an approved process¹² • 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. <p>This definition was endorsed by the Agricultural Ministers' Council through AGMIN OOS 04/2014.</p>

¹² 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 the Animal Health Committee for which an acceptable risk assessment has been undertaken and that is subject to compliance verification.

Term	Definition
Swill feeding	<p>Also known as 'feeding prohibited pig feed', includes:</p> <ul style="list-style-type: none"> • 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. <p>This definition was endorsed by the Agricultural Ministers' Council through AGMIN OOS 04/2014.</p>
Trace premises (TP)	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).
Tracing	The process of locating animals, persons or other items that may be implicated in the spread of disease, so that appropriate action can be taken.
Unknown status premises (UP)	A premises within a declared area where the current presence of susceptible animals and/or risk products, wastes or things is unknown.
Vaccination	Inoculation of individuals with a vaccine to provide active immunity.
Vaccine	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.
- adjuvanted	A vaccine in which one or several disease-causing agents are combined with an adjuvant (a substance that increases the immune response).
- attenuated	A vaccine prepared from infective or 'live' microbes that are less pathogenic but retain their ability to induce protective immunity.
- gene deleted	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.
- inactivated	A vaccine prepared from a virus that has been inactivated ('killed') by chemical or physical treatment.
- recombinant	A vaccine produced from virus that has been genetically engineered to contain only selected genes, including those causing the immunogenic effect.

Term	Definition
Vector	A living organism (frequently an arthropod) that transmits an infectious agent from one host to another. A <i>biological</i> vector is one in which the infectious agent must develop or multiply before becoming infective to a recipient host. A <i>mechanical</i> vector is one that transmits an infectious agent from one host to another but is not essential to the life cycle of the agent.
Veterinary investigation	An investigation of the diagnosis, pathology and epidemiology of the disease. <i>See also</i> Epidemiological investigation
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.

Abbreviations

Standard AUSVETPLAN abbreviations

Abbreviation	Full title
AAHL	Australian Animal Health Laboratory
AN	assessed negative
APF	approved processing facility
ARP	at-risk premises
AUSVETPLAN	Australian Veterinary Emergency Plan
CA	control area
CCEAD	Consultative Committee on Emergency Animal Diseases
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CVO	chief veterinary officer
DCP	dangerous contact premises
DCPF	dangerous contact processing facility
EAD	emergency animal disease
EADRA	Emergency Animal Disease Response Agreement
EADRP	Emergency Animal Disease Response Plan
EDTA	ethylenediaminetetraacetic acid (anticoagulant for whole blood)
ELISA	enzyme-linked immunosorbent assay
GP	general permit
IETS	International Embryo Transfer Society
IP	infected premises
LCC	local control centre
NASOP	nationally agreed standard operating procedure
NMG	National Management Group
OA	outside area
OIE	World Organisation for Animal Health
PCR	polymerase chain reaction
POR	premises of relevance
RA	restricted area
RP	resolved premises

Abbreviation	Full title
SCC	state coordination centre
SP	suspect premises
SpP	special permit
TP	trace premises
UP	unknown status premises
ZP	zero susceptible species premises

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