# Methods for the destruction of poultry, pet/zoo birds and aviary species

AUSTRALIAN VETERINARY EMERGENCY PLAN

**VERSION 5.0, 2020** 

© 1991 – 2020 Animal Health Australia ABN 86 071 890 956. Certain materials in this publication are protected by copyright and are reproduced with permission from the Commonwealth of Australia, acting through its Department of Agriculture, Water and the Environment (or any successor agency); each State and Territory of Australia, as represented by their relevant agencies and by the National Biosecurity Committee and Animal Health Committee; and Animal Health Australia's industry members.

ISBN 0 642 24506 1 (printed version) ISBN 1 876 71438 7 (electronic version)

#### Licence



This work is licensed under the *Creative Commons Attribution*-*NonCommercial-ShareAlike 4.0 International License*, with the exception of:

- any third-party material contained within the work;
- any material protected by a trade mark; and
- any images and/or photographs.

To view a copy of this licence, visit <u>http://creativecommons.org/</u> <u>licenses/by-nc-sa/4.0/</u>.

#### **Moral Rights**

The author(s) of this work hold 'moral rights' as defined in the *Copyright Act 1986* (Cth) and assert all moral rights in connection with this work. This means you must:

- attribute (give credit to) the author(s) of this work;
- not say a person is a creator of a work when they are not; and
- not do something with the work (such as change or add to it) that would have a negative impact on the reputation of the author(s) of this work.

Failure to do so could constitute a breach of the *Copyright Act 1986* (Cth).

#### **Disclaimer and warranty**

- This publication has been produced in accordance with the procedures described in the AUSVETPLAN Overview, and in consultation with Australian Federal, State and Territory Governments; the relevant livestock industries; nongovernment agencies; and public health authorities, as relevant. Any views and opinions expressed in this document do not necessarily represent the views and opinion of the authors or contributors, Animal Health Australia or the Commonwealth of Australia.
- This publication is for use in emergency situations. The strategies and policy guidelines in this work are not applicable to quarantine policies for imported livestock or livestock products.
- This publication is not legal or professional advice and should not be taken as a substitute for legal or other professional advice.
- This publication is not intended for use by any person who does not have appropriate expertise in the subject matter of the work. Before using this publication, you should read it in full, consider its effect and determine whether it is appropriate for your needs.
- This publication was created on **June 2020**. Laws, practices and regulations may have changed since that time. You should make

your own inquiries as to the currency of relevant laws, practices and regulations as laws, practices and regulations may have changed since publication of this work.

No warranty is given as to the correctness of the information contained in this work, or of its suitability for use by you. To the fullest extent permitted by law, Animal Health Australia is not, and the other contributing parties are not, liable for any statement or opinion, or for any error or omission contained in this work and it and they disclaim all warranties with regard to the information contained in it, including, without limitation, all implied warranties of merchantability and fitness for a particular purpose. Animal Health Australia is not liable for any direct, indirect, special or consequential losses or damages of any kind, or loss of profit, loss or corruption of data, business interruption or indirect costs, arising out of or in connection with the use of this work or the information contained in it, whether such loss or damage arises in contract, negligence, tort, under statute, or otherwise.

#### Text under development

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 further worked on by experts and relevant text included at a future date.

#### **Contact information**

#### If:

- you have any requests or inquiries concerning reproduction and rights; or
- suggestions or recommendations, you should address those to:

#### AUSVETPLAN — Animal Health Australia

Executive Manager, Emergency Preparedness and Response PO Box 5116 Braddon ACT 2612 Tel: 02 6232 5522 email: aha@animalhealthaustralia.com.au

#### **Approved citation**

Animal Health Australia (2020). **Resource document:** *Methods for the destruction of poultry, pet/zoo birds and aviary species* (version 5.0). Australian Veterinary Emergency Plan (AUSVETPLAN), edition 5, Canberra, ACT.

#### 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.

#### **Publication record**

Edition 1: 1991 Version 1.0; 2014

Edition 5 Version 5.0, 2020 (minor update and new format)

#### Contents

1	1 Introduction			
	1.1	This do	cument 1	
		1.1.1	Purpose1	
		1.1.2	Scope1	
		1.1.3	Development1	
	1.2	Other d	locumentation 1	
	1.3	Trainin	g resources 2	
2	Decis	ion ma	aking3	
	2.1	Factors	s to consider 3	
		2.1.1	Overview	
		2.1.2	Animal welfare5	
	2.2	Destru	ction options	
		2.2.1	Inhaled agents5	
		2.2.2	Wet foam6	
		2.2.3	Injectable euthanasia agent7	
		2.2.4	Cervical dislocation7	
		2.2.5	Decapitation8	
		2.2.6	Gunshot8	
		2.2.7	Maceration8	
		2.2.8	Captive bolt	
		2.2.9	Unacceptable methods8	
3	Work,	, healt	h and safety	
	3.1	Site su	pervision10	
	3.2	Qualific	cations of equipment operators11	
	3.3	Operat	ional procedures during an incident or emergency response11	
	3.4	Briefin	g and induction11	
Арре	endix 1	Destr	ruction methods	
Арре	endix 2	Destr	ruction method matrix	
Glos	sary			
Abbr	eviatio	ons		



# 1

## Introduction

#### 1.1 This manual

#### 1.1.1 Purpose

As part of the Australian Veterinary Emergency Plan (AUSVETPLAN), this resource document has been developed to provide information on the various destruction methods available for poultry, pet/zoo birds and aviary species and factors to consider when determining the most appropriate method to use during the management of a particular emergency animal disease incident.

Together with the other components of AUSVETPLAN, this resource document has been developed to help ensure that an efficient, effective and coherent response can be implemented consistently across Australia with minimal delay.

#### 1.1.2 Scope

This resource document applies to farmed poultry, including, but not limited to caged, barn reared and free range poultry. It may also be applied to pet/zoo birds and aviary species. Future reference to 'poultry' will be considered to include other bird species.

The implementation of the chosen method of destruction is not within the scope of this document.

#### 1.1.3 Development

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

In this document, 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 endorsed document. The issues will be worked on by experts and relevant text included at a future date.

#### **1.2 Other documentation**

This resource document should be read and implemented in conjunction with:

• Other AUSVETPLAN documents, including the response strategies; operational, enterprise and management manuals; and, any relevant guidance and resource documents. The complete series of manuals is available on the Animal Health Australia website.<sup>1</sup>

<sup>1</sup> www.animalhealthaustralia.com.au/our-publications/ausvetplan-manuals-and-documents/



Chickens in poultry shed.

- Relevant nationally agreed standard operating procedures (NASOPs)<sup>2</sup>. These procedures complement AUSVETPLAN and describe in detail specific actions undertaken during a response to an incident. NASOPs have been developed for use by jurisdictions during responses to emergency animal disease (EAD) incidents and emergencies.
- Relevant jurisdictional or industry policies, response plans, standard operating procedures and work instructions.
- Relevant Commonwealth and jurisdictional legislation; and, legal agreements (such as the EADRA<sup>3</sup>, where applicable).

#### **1.3 Training resources**

#### EAD preparedness and response arrangements in Australia

The EAD Foundation Online course<sup>4</sup> provides livestock producers, veterinarians, veterinary students, government personnel and emergency workers with foundation knowledge for further training in EAD preparedness and response in Australia.

 $<sup>2 \\</sup> www.animalhealthaustralia.com.au/what-we-do/emergency-animal-disease/nationally-agreed-standard-operating-procedures/$ 

<sup>3</sup> https://animalhealthaustralia.com.au/what-we-do/emergency-animal-disease/ead-response-agreement/

<sup>4</sup> www.animalhealthaustralia.com.au/emergency-animal-disease-training-program

# 2

## Decision making

#### 2.1 Factors to consider

#### 2.1.1 Overview

Factors to consider when choosing the most appropriate method of poultry and other birds destruction for a given situation are as follows:

- The disease agent
  - Nature of disease agent, including known epidemiology
  - Disease status of groups within the enterprise
- An assessment of the facilities including:
  - Number of enterprises involved
  - Nature of the enterprise (e.g. free range, barn etc. and buildings/facilities available)
  - Access to the premises and holding facilities within a premises
  - Number of birds by category / shed / type / design to be destroyed
    - ♦ Type of construction of housing
    - ♦ Integration with other enterprises, including processing plant
- Resources available
  - People
    - ◊ Number available
    - ♦ Skill set
    - ♦ Training required
  - Equipment and materials
    - ♦ Lethal agent e.g. injectable barbiturate, foam, CO<sub>2</sub>
    - Injection guns, foam generating machine(s), container(s)
    - ♦ Disinfection requirements
    - ♦ Transport requirements
- Affected bird species
- Environment
  - Urban or rural
  - Weather

- Topography
- Proximity to processing plant/s
- Proximity to other at-risk groups
- Proximity to human populations
- Proximity to transport corridors
- Workplace health and safety (WHS)
  - Zoonotic diseases
  - Medical status of field personnel (including current seasonal influenza vaccination status)
  - Access to human vaccines / antiviral medications
  - Personal protective equipment
- Animal welfare considerations (see section below)
- Political and community concerns
- Community health risks (perceived and actual)
- Cost considerations
- Timeliness considerations
- Disposal considerations.

During the destruction planning phase for zoonotic diseases, consideration should always be given to reducing the human handling of birds, or at least minimising the number of people involved in handling live birds, not only from a manual handling perspective, but also from a disease contagion perspective. Handling infected birds after death may reduce but not eliminate exposure to zoonotic diseases.



Chicken shed.

#### 2.1.2 Animal welfare

All personnel involved in the handling and euthanasia process have a duty of care to ensure the wellbeing of the poultry prior to destruction and that the process of killing is carried out humanely with the minimum of pain and distress to the poultry.

Personnel involved in the catching, transport, unloading and euthanasia of poultry must be suitably trained and competent to carry out the procedures to maximise the welfare of the poultry.

Suitable facilities must be available for the catching, holding and destruction of poultry to avoid stress and injury.

Injured poultry should be destroyed humanely as soon as practicable.

Poultry awaiting slaughter are to be treated with the same care as would be required under normal conditions and in accordance with legislation and Model Codes of Practice, including:

- The Welfare of Animals Domestic Poultry.
- The Australian Animal Welfare Standards and Guidelines Land Transport of Livestock.

The destruction process must ensure the poultry do not suffer undue stress or pain and where appropriate, pre-treatments to reduce stress (e.g. reduced lighting in housed poultry) should be considered ahead of destruction activities.

All staff should be briefed on welfare risks for birds from the selected destruction method. Appropriate persons must be nominated to monitor animal welfare outcomes on site. Should unconsciousness or death not occur within acceptable time frames, the slaughter process should be stopped and the system reviewed and improvements implemented.

#### 2.2 Destruction options

Poultry destruction methods that could be considered in the management of an emergency animal disease are detailed below. Some methods are not acceptable (e.g. for large scale premises or on welfare grounds) but are included for completeness. Advantages and disadvantages of each are detailed in <u>Appendix 1</u> while <u>Appendix 2</u> identifies the expected appropriateness of each destruction method against enterprise type.

The welfare of animals, WHS, and technical skills (training and experience) are important general requirements for all methods/procedures listed here.

Where a Local Control Centre (LCC) is operational, the Infected Premises Operations (IP Ops) Manager within the LCC is responsible for working with the IP section (that includes the IP Site Supervisor (IPSS) and Infected Premises teams) to assess all destruction options and recommend the most suitable method. The formal decision making process must be documented. The IP Ops Manager should then get approval to use the recommended method from the LCC Operations Manager.

#### 2.2.1 Inhaled agents

#### **Inhaled anaesthetics**

Inhaled anaesthetics may be used at high concentrations as a sole method of euthanasia or may be used to render birds unconscious before application of other methods of euthanasia. Their use is practically limited to situations where there are sufficiently small numbers of birds to be euthanased and where anaesthetic equipment is readily available.

Human exposure to anaesthetic gases should be considered in the planning and operational phases of the response.

#### Carbon dioxide (CO<sub>2</sub>)

CO<sub>2</sub> gassing often provides the most acceptable and operationally efficient system for destroying large numbers of poultry.

#### **Commercial poultry situations**

Field applications of  $CO_2$  for broilers have resulted in stress levels similar to that invoked via routine handling or stress and distress similar to the handling or restraint required for other methods of euthanasia.

Neonatal birds may be more acclimated to high  $CO_2$  concentrations, because the unhatched bird's environment typically has a high  $CO_2$  concentration (as high as 14% in the embryonic chicken). Consequently,  $CO_2$  concentrations required to achieve euthanasia of newly hatched chicks may be much higher (as much as 80% to 90%) than those for adults of the same species. In such cases, a cocktail of  $CO_2$  and nitrogen should be considered. Diving birds also have physiologic adaptations to hypercapnia and may require higher  $CO_2$  concentrations for euthanasia.

Use of CO<sub>2</sub> will, in many cases, be the preferred option for caged poultry in commercial poultry situations, however, a risk assessment considering the disease agent, human health impacts and manual labour requirements must be undertaken to determine whether it is preferred to remove poultry from cages prior to or following application.

While  $CO_2$  application will also be an option for poultry on the ground (i.e. not in cages), gassing can be accomplished either in the trays/hoppers of trucks, in garbage skips, or in the poultry sheds themselves.

An option in deep litter sheds is gassing all poultry at once, if operationally efficient and safe. Modern commercial deep litter sheds appear to make this a possibility and this option can be considered in decision making. It provides some opportunities to decrease exposure levels to people, especially if composting the carcasses and litter *in situ* inside the shed is a disposal option. If disposal is inside the shed, picking up of dead poultry requires less skilled labour than catching live poultry on litter and decreases the exposure risks of people to zoonotic diseases.

#### Non-commercial or small scale operations

Where pet poultry, backyard poultry or aviary poultry are to be destroyed, small scale gassing operations can be constructed using small  $CO_2$  cylinders or dry ice in bags and wheelie bins, cardboard boxes etc. as the container. Care must be taken to accommodate the particular sensitivities of these owners who generally will be more emotionally attached to their poultry.

#### 2.2.2 Wet foam

Wet foam depopulation is a process by which foam generating equipment is used to create a blanket of foam to immerse a group of poultry.

The process of foam generation uses a pump to shift water from a suitable water source into a foam generating system. Foam concentrate is inducted into the water stream and this solution is forced through a mesh screen to mix with air. The resulting combination of foam concentrate, water and air produces a foam blanket which is used to fill a poultry house and immerse poultry. Replacement of CO<sub>2</sub> in the foam bubbles over air yields no euthanasia advantage and carries with it an additional WHS hazard; its use is not recommended.

The method works by generating water-based foam and delivering it to floor-based chickens in a confined space so that a blanket of foam covers the birds and mechanically occludes their airways (asphyxiation) resulting in hypoxia and death. This destruction process takes approximately three minutes (Benson et al 2009, Benson et al 2012), which is comparable to CO<sub>2</sub> gassing.

Histopathological studies demonstrate that poultry do not drown and corticosteroid levels are comparable to those stress levels associated with routine management practices such as 'catching stress' (Benson, 2007).

Wet foam depopulation has a number of advantages in the management of zoonotic diseases such as avian influenza because it reduces exposure of humans to live birds by reduction or elimination of handling live poultry.

Wet foam has successfully been used in Australia and overseas for the destruction of broilers, layer hens, turkeys, chukars, quail and ducks (Benson et al, 2009). This method is only appropriate for ground based poultry as foam heights are not expected to be able to be reached in elevated/tiered poultry housing systems.

There are species specific differences in the time to death. Mean elapsed time to brain death using water based foam has been recorded as 133s, 183s, 193s and 283s for broilers, layers, turkeys and ducks respectively (Benson et al 2012).

Key foam parameters to manage animal welfare risks are bubble size, depth, persistence and fluidity of the foam. More information on the use of the foam depopulation unit including *Standard Operating Procedure: Depopulating Poultry with a Foam Depopulation Unit* is available from the Victorian Department of Environment and Primary Industries.

#### 2.2.3 Injectable euthanasia agent

Intravenous injection of an injectable euthanasia agent is one of the quickest and most reliable means of euthanizing birds when it can be performed without causing fear or distress.

Lethal injections are a useful method of euthanasia of small sized flocks. Barbiturates (e.g. pentobarbitone sodium) are the most likely widely available drug to be used in Australia. Record keeping requirements will vary by jurisdiction.

If it is decided that use of lethal injection is the preferred method of destruction, it is essential that the operational procedures and work site layout ensure minimum opportunity for accidental injection of the injector or the persons holding the poultry for injection. Physical separation of persons, skilled handlers and sufficient facilities for the task are essential.

In conscious birds, injectable euthanasia agents should only be administered intravenously. Otherwise, intracoelomic, intracardiac and intraosseous routes may be used in unconscious or anesthetized birds but using dual methods is not logistically practical in most cases.

#### 2.2.4 Cervical dislocation

Cervical dislocation is acceptable if performed by skilled and experienced operators and is typically used for small birds (<200g) but can be performed successfully on birds as large as 2.3kg. However, when used on larger and older poultry, it can require significant physical effort and care must be exercised to ensure operators are able to meet acceptable animal welfare standards.

Its use is most likely limited to small numbers of birds as operator fatigue frequently compromises the procedure when applied in larger flocks.

#### 2.2.5 Decapitation

Decapitation is acceptable for small birds and small flocks where other options are not possible. However, due to the contamination of the environment with potentially infected blood, it is less desirable from a biosecurity viewpoint and creates a larger clean-up and decontamination job afterwards. The use of sharp and heavy implements for decapitation also has WHS implications that need to be addressed in the planning and operational phases.

A modification of the decapitation option is to use large cattle burdizzos to sever/crush the neck and spinal cord while leaving the skin intact. Used properly, this method will render immediate death without the complication of environmental contamination with blood and feathers. Two operators are needed to use this method.

#### 2.2.6 Gunshot

Gunshot is not recommended as a method for captive birds, where restraint is feasible. Furthermore, gunshot from a distance will require significant accuracy which, while it may be successful in killing a single bird, has great potential for evoking fear responses in those poultry in the immediate environment. Use of free-flying bullets has WHS implications that need to be addressed in the planning and operational phases.

#### 2.2.7 Maceration

Maceration causes immediate fragmentation and death of newly hatched poultry and embryonated eggs. The American Association of Avian Pathologists found that use of commercially available macerators for euthanasia of chicks, poults, and pipped eggs resulted in immediate death in poultry up to 72 hours old and that it occurs with minimal pain and distress.

Maceration requires special equipment that must be kept in excellent working order. Newly hatched poultry must be delivered to the macerator in a way and at a rate that prevents a backlog at the point of entry into the macerator and without causing injury, suffocation, or avoidable distress before maceration.

#### 2.2.8 Captive bolt

Captive bolt guns may also be used on larger birds including turkeys, chickens, geese, ducks and emu. Appropriate animal restraint is required when using the captive bolt.

#### 2.2.9 Unacceptable methods

#### Ventilation shutdown

While it is possible to produce death by overheating or suffocation (via the use of environmental controls such as shutting down ventilation), the duty of care in relation to animal welfare is severely compromised. Nationally, insufficient evidence exists to endorse the use of ventilation shutdown as a destruction method - therefore it is not currently approved as an acceptable method of destruction. This option may need to be revisited if community concerns/pressure forces the rapid depopulation of poultry sheds.

#### Avicides

An avicide is any substance (normally, a chemical) which can be used to kill birds. Alphachloralose or other agents may be suitable as an avicide, though the American Veterinary Medical Association does not consider it an acceptable euthanasia agent<sup>5</sup>.

5 Ibid



Large industrial fan.

The APVMA has determined that it is in the public interest for vertebrate pest control products containing alphachloralose to be restricted chemical products (RCPs), effective 16 December 2009. Alphachloralose is controlled under the *Agricultural and Veterinary Chemicals (Control of Use) Act 1995* and may only be supplied to or used by an authorised person. The restricted use of this chemical and label directions are designed to minimise exposure of non-target animals and birds to this compound.

#### Other methods

Intravenous injection of potassium chloride, exsanguination and thoracic compression should not be used in conscious or anaesthetised birds. The techniques may be used if poultry are unconscious or completely anaesthetised prior to the procedure and biosecurity concerns including environmental contamination of blood (through exsanguination for example) can be sufficiently addressed.



### Work, health and safety

Work, health and safety (WHS) may occur due to the presence of zoonotic disease (e.g. avian influenza). This aspect needs special consideration during the on-site risk assessment done by the Infected Premises Site Supervisor (IPSS).

#### 3.1 Site supervision

The IPSS is to ensure that the site has been assessed for potential risks prior to commencement of operations. Identified risks must be addressed and all staff advised of the risk treatments or risk avoidance procedures to be implemented. Appropriate persons must be nominated to monitor WHS on site and at least one such person should be on site at all times during large operations while destruction operations are occurring to monitor WHS compliance. All staff should be advised on possible adverse psychological effects of such mass destruction events and debriefed appropriately.



Poultry site undergoing foam depopulation.

#### 3.2 Qualifications of equipment operators

All operators of equipment must be appropriately qualified for operation of the equipment as required by law. In the case of operation of  $CO_2$  equipment where qualifications are not specified, operators must be experienced in handling of the gas, or receive instruction to the satisfaction of the Infected Premises Operations Teams (IPOT) manager and Workplace Health and Safety Officer (WHSO.) The nature of instruction received and processes to be used are to be documented by the IPSS or Destruction Coordinator and filed in the Local Control Centre (LCC) central file. Refer to the APVMA Permit 7472<sup>6</sup> for conditions of use of  $CO_2$ .

#### 3.3 Operational procedures during an incident or emergency response

Where a formal standard operating procedure (SOP) has not been developed for a destruction activity, the IPSS or Destruction Team Leader or on-site WHSO is to record the procedure to be used, conduct and record a risk assessment, and modify the procedures to incorporate appropriate risk treatments or risk avoidance options. This must be submitted to the Destruction Coordinator in the LCC for sign off before commencement of activities.

Where bulk  $CO_2$  is being used in enclosed/confined spaces (e.g. during shed depopulation, using skips as containers for euthanasia), at least one appropriately trained and equipped officer with self-contained breathing apparatus (SCBA) must be on site to assist in emergency situations that would necessitate entry to an enclosed/confined space containing  $CO_2$ .

#### 3.4 Briefing and induction

All persons entering a destruction site or participating in destruction operations must be:

- briefed on the disease agent and any possible affects it might have on human health
- inducted into the appropriate area
- briefed on identified risks and required WHS procedures, including when undertaking CO<sub>2</sub> gas destruction, the adverse effects of CO<sub>2</sub> on humans and safety instructions, as applicable and
- provided with the Safety Data Sheets (SDS) for carbon dioxide or any other chemicals used e.g. pentobarbitone sodium.

<sup>6</sup> http://permits.apvma.gov.au/PER7472.PDF



#### **Destruction methods**

Method	Population Size	Definition	Advantages	Disadvantages
Cervical dislocation	Small	Manual cervical dislocation to sever the spinal cord	<ul> <li>Cheapest method as requires no equipment</li> <li>Non-invasive</li> <li>Quick</li> </ul>	<ul> <li>Bird handling and restraint can be stressful to birds and operator</li> <li>WH&amp;S risks for operators especially in regards to repetitive tasks</li> <li>Is not consistently effective</li> <li>Inconsistent &amp; unreliable results for large numbers</li> <li>Operator fatigue &amp; distress</li> <li>Difficult with large poultry (suitable only for birds &lt;2.3kg)</li> <li>Not aesthetically pleasing</li> </ul>
Decapitation	Small	Manual removal of the head without anaesthesia	<ul> <li>Quick and effective when used properly</li> <li>Suitable for a range of species and body sizes</li> </ul>	<ul> <li>May result in environmental contamination and human contamination by blood</li> <li>Bird handling and restraint can be stressful to birds and operator</li> <li>Inconsistent &amp; unreliable results for large numbers</li> <li>Operator fatigue &amp; distress</li> <li>Difficult with large poultry (suitable only for birds &lt;2.3kg)</li> <li>Not aesthetically pleasing</li> <li>Potentially dangerous to operators and by-standers</li> </ul>

Method	Population Size	Definition	Advantages	Disadvantages
Gunshot	Small	A projectile(s) fired from a firearm causing physical damage to the brain	<ul> <li>Quick &amp; effective when used properly</li> <li>Minimal or no restraint required</li> <li>Kill from a distance</li> </ul>	<ul> <li>Potentially dangerous to operators and by-standers</li> <li>Destruction of brain may prevent diagnosis of some diseases</li> <li>Leakage of body fluid a biosecurity risk</li> <li>Legal requirements e.g. licensing, training etc.</li> <li>Unavailability of competent personnel</li> <li>Aesthetically unpleasant for many</li> <li>Requires skill and appropriate firearm</li> </ul>
Maceration	Small to large	Use of a specially designed mechanical apparatus having rotating blades or projections, causes immediate fragmentation and death of poultry up to 72 hours old and embryonated eggs	<ul> <li>Preferred application is for newly hatched poultry (up to 72hours of age) and embryonated eggs</li> <li>Generally safe for personnel</li> </ul>	<ul> <li>Newly hatched poultry must be delivered to the macerator in a way and at a rate that prevents a backlog at the point of entry.</li> <li>Not appropriate for birds older than 72 hours</li> <li>Requires well maintained special equipment</li> <li>Macerated tissues may present biosecurity risks</li> </ul>
Captive bolt	Small	Use of a specially designed apparatus that fires a captive penetrating bolt that causes physical damage to the brain	<ul> <li>Low cost</li> <li>Easy to use</li> <li>Suitable for large birds</li> <li>More than one operator can safely work in the same area</li> </ul>	<ul> <li>Requires animal restraint</li> <li>Potentially dangerous to operators and restrainers</li> <li>Leakage of body fluid a biosecurity risk</li> <li>Requires skill and appropriate tool</li> <li>Suitable only for small numbers of animals as method is slow compared with other methods</li> </ul>

14

Method	Population Size	Definition	Advantages	Disadvantages
Ventilation shutdown	Small to large	The use of environmental controls such as shutting down ventilation is used to produce death by overheating or suffocation	<ul> <li>Eliminates the need to handle live poultry</li> <li>Reduces exposure of operators to zoonotic diseases</li> </ul>	<ul> <li>Duty of care in relation to animal welfare is severely compromised</li> <li>Insufficient evidence exists nationally to endorse the use of ventilation shutdown as a destruction method - therefore it is not currently approved as an acceptable method of destruction.</li> </ul>
Avicides	Small	An external agent mixed with feed or water to anaesthetise/poison poultry which can then be killed by another method	<ul> <li>Suitable for wild species</li> <li>May result in death</li> <li>Biosecurity advantages for large numbers of diseased poultry</li> </ul>	<ul> <li>Non-target animals may gain access in an open environment</li> <li>Dose unregulated producing variable results</li> <li>Animals may reject adulterated feed or water due to illness or flavour</li> <li>Most often needs to be followed by killing</li> <li>Care needed in preparation &amp; disposal for feed/water and disposal of contaminated carcasses</li> <li>May affect the disposal choice (e.g. be cognizant of scavenging)</li> <li>Restricted use by the APVMA for alphachloralose</li> </ul>



#### **Destruction method matrix<sup>7</sup>**

Method of	Category of poultry / enterprise type							
destruction	Pet/Zoo poultry/ birds	Layers in cages	Layers on the floor	Layers free range	Broilers on the floor	Broilers free range	Pullets in cages	
	<ul><li>individual or groups</li><li>all species</li><li>in transit</li></ul>	Incl. breeders	Incl. breeders	Incl. breeders	Incl. started pullets			
Inhaled agent – inhaled anaesthetic	<ul> <li>Appropriate.</li> <li>Must have specialised equipment.</li> </ul>	Not appropriate fo	r large numbers of p	oultry				
Inhaled agent – carbon dioxide	<ul><li>For larger groups.</li><li>Can use small bins.</li></ul>	<ul><li>Good for large n</li><li>Uses a large nu</li></ul>	numbers of poultry. mber of team memb	ers.				
Gas in container (wheelie bin, skip)		<ul> <li>Availability of sc</li> <li>Welfare risks wi</li> <li>Requires remov</li> </ul>	ome resources may b th inappropriateCO2 al of birds from cage	pe rate limiting e.g. C management. rs.	:0 <sub>2</sub> supply, vaporiser	S.		
Inhaled agent – carbon dioxide	Possible but inefficient	May be resource limited for large number of farms	Not applicable in all situations – will require	Not applicable in all situations – will require	Not applicable in all situations – will require	Not applicable in all situations – will require	May be resource limited for large number of farms	
Bulk gas in truck body or tray or other suitable large container		Will require removal of birds from cages to container	catching of birds and removal to container	catching of birds and removal to container	catching of birds and removal to container	catching of birds and removal to container	Will require removal of birds from cages to container	

7 Layers = chickens, quail, turkeys. Broilers = chickens, quail, turkeys, ducks, pigeons. Be mindful of breath holding in some aquatic birds and application in large birds for some euthanasia methods.

Method of	Category of poultry / enterprise type							
destruction	Pet/Zoo poultry/ birds	Layers in cages	Layers on the floor	Layers free range	Broilers on the floor	Broilers free range	Pullets in cages	
	<ul><li>individual or groups</li><li>all species</li><li>in transit</li></ul>	Incl. breeders	Incl. breeders	Incl. breeders	Incl. started pullets			
Inhaled agent – carbon dioxide In shed Preparation of sheds difficult. Allow timing to remove caged poultry from cages afterwards	Where building is near airtight, or can be covered completely	Controlled environment sheds or similar, need to wrap other sheds.	Controlled environment sheds or similar, need to wrap other sheds.	Not applicable in all situations – some free range operations use sheds to house poultry at night	Controlled environment sheds or similar, need to wrap other sheds.	Not applicable in all situations – some free range operations use sheds to house poultry at night	Controlled environment sheds or similar, need to wrap other sheds.	
Wet foam	<ul> <li>Possible but inefficient.</li> <li>Must have specialised equipment</li> </ul>	<ul> <li>Not suitable for tiered systems</li> <li>Requires removal of birds from cages.</li> </ul>	<ul> <li>Avoid crowding</li> <li>Will require enc</li> <li>Difficult to monitation</li> </ul>	/ piling up. losing poultry. tor welfare outcome	s.	1	<ul> <li>Not suitable for tiered systems</li> <li>Requires removal of birds from cages.</li> </ul>	
Injectable euthanasia agent	<ul><li> Preferred.</li><li> Must have veterinary supervision</li></ul>	<ul> <li>Must have veter</li> <li>Skilled and expension</li> <li>Slow for large n</li> </ul>	rinary supervision erienced operators numbers					

18

Method of	Category of poultry / enterprise type							
destruction	Pet/Zoo poultry/ birds	Layers in cages	Layers on the floor	Layers free range	Broilers on the floor	Broilers free range	Pullets in cages	
	<ul><li>individual or groups</li><li>all species</li><li>in transit</li></ul>	Incl. breeders	Incl. breeders	Incl. breeders	Incl. started pullets			
Cervical dislocation	<ul> <li>Skilled and experienced operators only.</li> <li>Appropriate.</li> <li>May be aesthetically unpleasing for owners.</li> </ul>	<ul> <li>Not appropriate for large numbers of poultry</li> <li>Skilled and experienced operators only.</li> </ul>						
Decapitation	<ul> <li>Appropriate.</li> <li>May be aesthetically unpleasing for owners.</li> </ul>	<ul> <li>Not appropriate for large numbers of poultry.</li> <li>Skilled and experienced operators only.</li> </ul>						
Gunshot	Maybe useful for larger free range poultry e.g. emus, ducks	Not appropriate						

Method of	Category of poultry / enterprise type								
destruction	Pet/Zoo poultry/ birds	Layers in cages	Layers on the floor	Layers free range	Broilers on the floor	Broilers free range	Pullets in cages		
	<ul><li>individual or groups</li><li>all species</li><li>in transit</li></ul>	Incl. breeders	Incl. breeders	Incl. breeders	Incl. started pullets				
Maceration	<ul> <li>Possible but inefficient.</li> <li>Only suitable for embryonated eggs and poultry up to 72 hours of age.</li> <li>Requires specialist equipment.</li> </ul>	<ul><li>Only suitable fo</li><li>Requires specia</li></ul>	r embryonated eggs Ilist equipment.	and poultry up to 72	hours of age.				
Captive bolt	Maybe useful for larger poultry where there are limited numbers	Not appropriate fo	r large numbers of p	poultry					
Ventilation shutdown	Not applicable or suitable.	<ul> <li>Not recommended but could be used under extreme circumstances</li> <li>Significant welfare issues</li> </ul>							
Avicides	Alphachloralose to bait for difficult to catch poultry/birds then other method for euthanasia	Not appropriate	Not appropriate	Alphachloralose to bait for difficult to catch poultry/ birds then other method for euthanasia	Not appropriate	Alphachloralose to bait for difficult to catch poultry/ birds then other method for euthanasia	Not appropriate		

# Glossary

#### Standard AUSVETPLAN terms

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, hoofs, bones, fertiliser).
Animal Health Committee	A committee whose members are the chief veterinary officers of the Commonwealth, states and territories, along with representatives from the CSIRO Australian Centre for Disease Preparedness (ACDP) and the Department of Agriculture, Water and the Environment. There are also observers from Animal Health Australia, Wildlife Health Australia, and the New Zealand Ministry for Primary Industries. The committee provides advice to the National Biosecurity Committee on animal health matters, focusing on technical issues and regulatory policy.
	See also 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 disposal site	A premises that has zero susceptible livestock and has been approved as a disposal site for animal carcasses, or potentially contaminated animal products, wastes or things.
Approved processing facility	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	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, Water and the Environment who manages international animal health commitments and the Australian Government's response to an animal disease outbreak.
	See also Chief veterinary officer
AUSVETPLAN	Australian Veterinary Emergency Plan. Nationally agreed resources that guide decision making in the response to emergency animal diseases (EADs). It outlines Australia's preferred approach to responding to EADs of national significance, and supports efficient, effective and coherent responses to these diseases.
Carcase	The body of an animal slaughtered for food.
Carcass	The body of an animal that died in the field.
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.
	See also 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, to facilitate disease control and/or trade.
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 chief veterinary officers, representatives of CSIRO-ACDP and the relevant industries, and the Australian Chief Veterinary Officer 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 state/territory) 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.
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.
	See also 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.
	See also Compensation, Cost-sharing arrangements
Endemic animal disease	A disease affecting animals (which may include humans) that is known to occur in Australia.
	See also Emergency animal disease, Exotic animal disease
Enterprise	See 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.
	See also 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.
	See also Emergency animal disease, Endemic animal disease
Exotic fauna/feral animals	See 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.
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.
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 a pathogen into an animal and the first clinical signs of the disease.

Index case	The first case of the disease to be diagnosed in a disease outbreak.
	See also 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	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	A committee that 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 committee 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, Water and the Environment 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	See Wild animals

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: <u>www.oie.int/</u> <u>international-standard-setting/terrestrial-code/access-online</u> .
OIE Terrestrial Manual	OIE Manual of diagnostic tests and vaccines for terrestrial animals. 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/en/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 not considered at the time of classification 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.
Proof of freedom	Reaching a point following an outbreak and post-outbreak surveillance when freedom from the disease can be claimed with a reasonable level of statistical confidence.
Quarantine	Legally enforceable requirement that prevents or minimises spread of pests and disease agents by controlling the movement of 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.
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 and garbage depots.
Sensitivity	The proportion of truly positive units that are correctly identified as positive by a test.
	See also 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. See also General permit
Specificity	The proportion of truly negative units that are correctly identified as negative by a test.
	See also 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	The emergency operations centre that directs the disease control operations to be undertaken in a state or territory.
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	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.
	or
	An animal not known to have been exposed to a disease agent but showing clinical signs requiring differential diagnosis.
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	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
	<ul> <li>material containing flesh, bones, blood, offal or mammal carcases that is treated by an approved process1</li> </ul>
	• 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
	<ul> <li>material used under an individual and defined-period permit issued by a jurisdiction for the purposes of research or baiting.</li> </ul>
	Refer to jurisdictional legislation for approved processes. Jurisdictions may have approved processes that meet the following minimum standards:
	<ul> <li>rendering in accordance with the Australian Standard for the Hygienic Rendering of Animal Products</li> </ul>
	<ul> <li>under jurisdictional permit, cooking processes subject to compliance verification that ensure that an internal temperature of at least 100 °C for a minimum of 30 minutes, or equivalent, has been reached</li> </ul>
	<ul> <li>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</li> </ul>
	• 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.
	This definition was endorsed by the Agriculture Ministers' Council through AGMIN 00S 04/2014.

Swill feeding	Also known as 'feeding prohibited pig feed', it includes:
	<ul> <li>feeding, or allowing or directing another person to feed, prohibited pig feed to a pig</li> <li>allowing a pig to have access to prohibited pig feed</li> <li>the collection and storage or possession of prohibited pig feed on a premises where one or more pigs are kept</li> <li>supplying to another person prohibited pig feed that the supplier knows is for feeding to any pig.</li> </ul>
	This definition was endorsed by the Agriculture Ministers' Council through AGMIN 00S 04/2014.
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, people 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.
Vector	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 lifecycle of the agent.
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 – exotic fauna	Animals of domestic species that are not confined or under control (eg cats, horses, pigs).
	Nondomestic animal species that are not indigenous to Australia (eg foxes).
Wool	Sheep wool.
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, to facilitate disease control and/or trade.
Zoonosis	A disease of animals that can be transmitted to humans.

# **Abbreviations**

#### Standard AUSVETPLAN abbreviations

ACDP	Australian Centre for Disease Preparedness
AN	assessed negative
ARP	at-risk premises
AUSVETPLAN	Australian Veterinary Emergency Plan
СА	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
NMG	National Management Group
AO	outside area
OIE	World Organisation for Animal Health
PCR	polymerase chain reaction
POR	premises of relevance
RA	restricted area
RP	resolved premises
SCC	state coordination centre
SP	suspect premises
SpP	special permit
ТР	trace premises
UP	unknown status premises
ZP	zero susceptible stock premises