AUSTRALIAN VETERINARY EMERGENCY PLAN

AUSVETPLAN

Response strategy
African swine fever

Version 5.1

AUSVETPLAN is a series of technical response plans that describe the proposed Australian approach to an emergency animal disease incident.

The documents provide guidance based on sound analysis, linking policy, strategies, implementation, coordination and emergency management plans.

National Biosecurity Committee

ISBN 0 642 24506 1 (printed version)

ISBN 1 876 71438 7 (electronic version)

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In this manual, text placed in square brackets [xxx] indicates that that aspect of the manual remains unresolved 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.

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Approved citation

Animal Health Australia (2022). *Response strategy: African swine fever* (version 5.1). Australian Veterinary Emergency Plan (AUSVETPLAN), edition 5, Canberra, ACT.

EMERGENCY ANIMAL DISEASE WATCH HOTLINE: 1800 675 888

The Emergency Animal 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

Edition 2
Version 2.0, 1996 (major update)

Edition 3
Version 3.0, 2007 (major update and inclusion of new cost-sharing arrangements)

Edition 5
Version 5.0, 2020 (major update and new format)
Version 5.1, 2022 (major update)

Contents

1 Introduction

1.1 This manual

1.1.1 Purpose

As part of AUSVETPLAN (the Australian Veterinary Emergency Plan), this response strategy contains the nationally agreed approach for the response to an incident – or suspected incident – of African swine fever (ASF) in Australia. It has been developed to guide decision making to ensure that a fast, efficient and effective response can be implemented consistently across Australia with minimal delay.

1.1.2 Scope

This response strategy covers ASF caused by ASF virus.

The response strategy provides information about:

- the disease (Section 2)
- the implications for Australia (potential pathways of introduction; expected social, environmental, human health and economic effects; and critical factors for a response to the disease) (Section 3)
- the agreed default policy, and guidelines for agencies and organisations involved in a response to an outbreak (Section 4)
- declared areas and premises classifications (Section 5)
- biosecurity controls, including quarantine and movement controls (Section 6)
- response surveillance and establishing proof of freedom (Section 7).

The key features of ASF are described in the **African swine fever fact sheet** (Appendix 1).

1.1.3 Development

The strategies in this document for the diagnosis and management of an outbreak of ASF are based on risk assessment. They are informed by the recommendations in the World Organisation for Animal Health (OIE) *Terrestrial animal health code* (Chapter 15.1) and the OIE *Manual of diagnostic tests and vaccines for terrestrial animals* (Chapter 3.9.1). The strategies and policy guidelines are for emergency situations, and are not applicable to policies for imported animals or animal products.

This manual 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 manual, text placed in square brackets [xxx] indicates that that aspect of the manual remains unresolved 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 Other documentation

This response strategy should be read and implemented in conjunction with:

- other AUSVETPLAN documents, including the operational, enterprise and management manuals; and any relevant guidance and resource documents. The complete series of manuals is available on the Animal Health Australia website1
- relevant nationally agreed standard operating procedures (NASOPs).2 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 and industry policies, response plans, standard operating procedures and work instructions
- relevant Commonwealth, and state and territory legislation and legal agreements (such as the Emergency Animal Disease Response Agreement,[3] where applicable).

1.3 Training resources

1.3.1 EAD preparedness and response arrangements in Australia

The EAD Foundation online course[4] provides livestock producers, veterinarians, veterinary students, government personnel and emergency workers with foundation knowledge for further training in EAD preparedness and response in Australia.

1 https://animalhealthaustralia.com.au/ausvetplan
2 https://animalhealthaustralia.com.au/nationally-agreed-standard-operating-procedures
3 https://animalhealthaustralia.com.au/eadra
4 https://animalhealthaustralia.com.au/online-training-courses

2 Nature of the disease

African swine fever (ASF) is a contagious disease of pigs that may result in high or low case mortality rates, fever, hyperaemia of the skin and a variety of other clinical signs, including incoordination, diarrhoea and pneumonia.

It is clinically indistinguishable from classical swine fever (CSF), and similar lesions are seen at postmortem examination. The diagnosis needs to be confirmed by laboratory identification and characterisation of the causative virus.

OIE listing

ASF is a World Organisation for Animal Health (OIE)–listed disease.[5]

2.1 Aetiology

The causative agent of ASF is ASF virus, an enveloped, double-stranded DNA virus. It is classified as the only member of the genus *Asfivirus* in the family *Asfarviridae*. ASF virus is the only DNA virus known to be transmitted by arthropods.

ASF virus isolates can be divided into more than 20 different genotypes, reflecting their geographical relatedness. Although genotype does not usually indicate virulence (Malogolovkin et al 2015, Beltrán-Alcrudo et al 2017), genotype 2 strains are typically associated with higher virulence. Genetically modified vaccine strains have appeared recently, and have been demonstrated to increase the risk of disease spread due to less severe clinical signs.

2.2 Susceptible species

All Suidae may be susceptible to infection, but disease is associated with domestic and feral pigs (*Sus scrofa*), and the Eurasian wild boar (*Sus scrofa scrofa*) (Beltrán-Alcrudo et al 2017).

In Africa, the African warthog (*Phacochoerus aethiopicus* and *P. africanus*), African bush pig (*Potamochoerus porcus*) and African giant forest hog (*Hylochoerus meinertzhageni*) are important in the epidemiology of ASF because they can be subclinically infected and may act as reservoirs of infection (Beltrán-Alcrudo et al 2017). The Timorese warty pig (*Sus celebensis timoriensis*) is also susceptible to infection with ASF virus (G Rawlin, Adjunct Professor Veterinary Science, AgriBio, La Trobe University, pers comm, 2019).

Although there are differing reports on the susceptibility of South American peccaries (in particular, the collared peccary – *Pecari tajacu*, and the white-lipped peccary – *Tayassu pecari*) to infection and disease (Viñuela 1985), they are considered not susceptible to infection and therefore not important in disease spread (Spickler 2018).

[5] OIE-listed diseases are diseases with the potential for international spread, significant mortality or morbidity within the susceptible species, and/or potential for zoonotic spread to humans. OIE member countries that have been free from a notifiable disease are obliged to notify the OIE within 24 hours of confirming the presence of the disease.

2.2.1 Zoonotic potential

ASF is not zoonotic.

2.3 World distribution

For the latest information on the distribution of ASF, refer to the OIE World Animal Health Information System.[6]

2.3.1 Distribution outside Australia

ASF is endemic in most of sub-Saharan Africa. In the latter half of the 20th century, ASF was reported in parts of South and Central America, and in Europe. The disease has since been eradicated from most of these countries, but remains endemic in feral pigs (wild boar) in Sardinia (an island of Italy).

Since 2007, ASF has become endemic in parts of eastern Europe and western Asia. In 2018, ASF was reported for the first time in China and recurred in western Europe. ASF continues to spread worldwide.

Genotype 1 strains have been associated with disease in Sardinia, and genotype 2 strains have been associated with the epizootics in Europe and Asia. The remaining genotypes are associated with disease in Africa.

The spread of the disease has become more complex with the appearance of vaccine strains of the virus.

2.3.2 Occurrence in Australia

There have been no outbreaks of ASF in Australia.

2.4 Epidemiology

2.4.1 Incubation period

The incubation period for ASF is said to be 4–19 days (Beltrán-Alcrudo et al 2017) and may be less than 5 days after exposure to ticks (Spickler 2018).

OIE incubation period

For the purposes of the OIE *Terrestrial animal health code*, the incubation period[7] for ASF is 15 days.

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[6] https://wahis.oie.int/#/home

[7] In the OIE *Terrestrial animal health code*, 'incubation period' means the longest period that elapses between the introduction of the pathogenic agent into the animal and the occurrence of the first clinical signs of the disease (see www.oie.int/en/what-we-do/standards/codes-and-manuals/terrestrial-code-online-access/?id=169&L=1&htmfile=glossaire.htm).

2.4.2 Persistence of agent and modes of transmission

General properties

ASF virus is an enveloped virus and is stable at a wide range of pH levels in serum-free medium (approximately pH 3.9–11.5); serum increases the stability of the virus (OIE 2018a). The virus remains viable for extended periods when frozen but can be inactivated by heat.

Viability of ASF virus has been recorded in a number of different substrates (Appendix 2); however, this information needs to be carefully interpreted because degradation/inactivation of ASF virus is influenced by a number of environmental factors in both field and laboratory settings (see 'Environment (including windborne spread)', below).

ASF virus has been reported as being susceptible to a limited range of disinfectants, such as sodium hydroxide, citric acid, calcium hypochlorite, and glutaraldehyde in combination with a quaternary ammonium compound (Plowright et al 1994, Krug et al 2012, OIE 2018a, Juszkiewicz et al 2019). For information on chemical agents and relevant concentrations for inactivation of ASF virus, refer to the Australian Pesticides and Veterinary Medicines Authority website.[8]

Environment (including windborne spread)

Factors in the environment affecting ASF virus viability

ASF virus will degrade or be inactivated in the environment. The time in which inactivation is achieved is influenced by a number of factors, including:

- matrix/substrate within which the ASF virus exists – protein and lipid substrates favour ASF virus longevity; accordingly, ASF virus may remain viable for prolonged periods in body tissues, blood and serum
- ambient temperature – ASF virus viability is favoured in cooler conditions and may be very prolonged in frozen conditions
- water content – ASF virus is susceptible to desiccation; urine and water sources favour longer-term viability
- ASF virus virulence and viral shedding – ASF virus virulence varies with genotype; more virulent viruses typically result in larger amounts of virus shedding, leading to an initial high viral titre in the environment.

These factors are summarised in Table 2.1.

Table 2.1 Summary of factors in the environment that affect ASF virus viability

Factor	Time for virus inactivation	
	Longer	Shorter
Protein or lipid content of substrate	Higher	Lower
Ambient temperature	Cooler	Warmer
Water content	Greater	Lesser
Virus virulence and viral shedding	More virulent, more shedding	Less virulent, less shedding

[8] https://portal.apvma.gov.au/permits;jsessionid=MhDM4fnEK7pjvo8yTPRlqw79

ASF virus virulence and half-life

Reduction in the quantity of virus in the environment is based on log reductions; therefore, a higher viral load initially will result in the virus persisting for longer. The half-life of the virus determines the viral load reductions, and has been documented primarily by Davies et al (2017) using the moderately virulent ASF virus isolate Ken05/Tk1 and small sample sizes.

Davies et al (2017) specifically noted differences between detection of viable (infectious) ASF virus and ASF viral DNA. For the purposes of decontamination through natural or chemical means, ASF virus rather than ASF viral DNA is more informative.

By using the half-life data provided by Davies et al (2017), the expected times that viable ASF virus may remain infectious and ASF DNA may remain detected in an indoor environment were calculated (Table 2.2) (refer also to Appendixes 2 and 3).

Table 2.2 Expected times for which viable ASF virus may remain infectious and ASF DNA may remain detectable in an indoor environment

ASF source	Time (days)			
	4 °C	12 °C	21 °C	37 °C
Viable virus	57	28	18	11
Detection of DNA	846	728	629	506

ASF virus titres have been reported to be significantly higher (10^6–10^8 HAD_{50}/mL[9]) in blood than in faeces and urine (Guinat et al 2014).

In highly contaminated cool and moist environments (eg pig pens with faeces, blood and urine from pigs infected with highly virulent virus) that are not cleaned and disinfected, environmental degradation of ASF virus is expected to take longer than under drier and hotter conditions. By estimating the mean initial titre of virus and extrapolating the time required to reach a titre less than 10 HAD_{50}/mL (the indicative infectious dose required via the oronasal route (Gallardo et al 2013)), the likely time that ASF virus will be inactivated under the specific environmental condition(s) can be determined. A reference tool is available from Animal Health Australia's emergency animal disease repository.[10]

In one of the very few studies looking at environmental transmission (Olesen et al 2018a), very small groups of pigs were introduced into pens that had been vacated by ASF virus–infected pigs at 3, 5 and 7 days. During the time the ASF virus–infected pigs were in the pens, faeces and wet bedding were removed each day except on the day of their euthanasia (Olesen et al 2018a), and, following their removal, visible blood contamination was washed away using Virkon S. The environmental virus titre that introduced pigs were exposed to was small, as indicated by high values for Cq (quantification cycle, in real-time PCR assay). The introduced pigs did not develop clinical signs of ASF, and viral DNA was not detected in the introduced pigs from blood samples taken over the following 3 weeks. The absence of infection in the introduced pigs may be a result of low virus exposure levels. Olesen et al (2018a) noted that had blood contamination not been washed away before introducing the pigs, the period of infectiousness from the environment may have been longer.

[9] HAD_{50} = 50% haemadsorbing doses

[10] [Under development]

Contact with contaminated water (eg from dumping of infected carcasses into waterways) could contribute to spread of ASF in some countries (McCullough 2018). Although ASF virus may remain viable in water, it is likely to be rapidly diluted in large bodies of water and is not expected to be present at infective levels (Beltrán-Alcrudo et al 2017).

Virus has been detected in air samples collected in rooms with experimentally infected pigs from day 4 post-inoculation to day 70 post-inoculation (de Carvalho Ferreira et al 2013a). This supports the concept that aerosols may play a role in transmission within herds (aerosol infection can occur over distances up to about 2–3 m), but windborne spread is not considered likely to contribute to spread of ASF virus between herds (Beltrán-Alcrudo et al 2017, Olesen et al 2017).

Susceptible animals

Live domestic animals

The primary route of infection is oronasal. The infectious dose of ASF virus via the oronasal route is estimated to be 10 HAD_{50}/mL (Gallardo et al 2013).[11] ASF virus may spread to pigs through sylvatic and tick–pig cycles (see 'Arthropod vectors', below). Direct and indirect mechanisms (eg biting insects) may spread the virus between domestic pigs and between herds.

Results from experimental and field studies support the finding that the overall rate of spread of outbreaks of ASF in wild boar and domestic pigs is constant, but relatively slow (Schulz et al 2019), suggesting relatively low infectiousness.

Movement of infected pigs is the most important means of spread between piggeries. Spread can also occur by the movement of carcasses, contaminated products (as swill), aerosols, mechanical vectors and fomites (including feed, vehicles, equipment, clothing, people and insects). Within herds, direct contact with the excretions and secretions of infected pigs, and ingestion of contaminated products, are the main mechanisms of spread (Olesen et al 2017).

Infected pigs shed virus in secretions and excretions, particularly blood, as well as in saliva, lachrymal discharges, nasal discharges, faeces and urine. Virus is also reported to be in secretions from the genital tract (Thacker et al 1984, Beltrán-Alcrudo et al 2017), although no studies confirming this transmission mechanism were found (see 'Semen and embryos from live susceptible animals', below).

Viral shedding reportedly occurs up to 2 days before clinical signs of disease appear (Penrith & Vosloo 2009, Beltrán-Alcrudo et al 2017). The reported period of shedding following infection varies from up to 1 month (Wilkinson 1986) to more than 70 days (Beltrán-Alcrudo et al 2017).

Animals surviving ASF infection may have ASF virus persisting for prolonged periods in tissues or blood; these animals are known as carriers or survivors. Survivors is the term used in this manual (also refer to Section 2.6). Survivors may remain persistently infected for several months (Wilkinson 1984, Oura et al 2005) and have been demonstrated to transmit infection to susceptible animals (de Carvalho Ferreira et al 2013b, Gallardo et al 2015). Pregnancy does not appear to cause reactivation of virus excretion.

There is no evidence of transmission from sows to fetuses (Penrith et al 2004). Infected sows, however, may abort (Sánchez-Vizcaíno et al 2012).

[11] HAD_{50} = 50% haemadsorbing doses

Live wild (including feral) animals

Wild boar have been associated with disease overseas. Feral pig populations may serve as reservoirs of infection, with the possibility of secondary spread to domestic pigs.

There is no indication that a density threshold exists for ASF, or that density would reflect sustainability of an infection in feral pigs (EFSA AHAW Panel 2018). Rather, density may be one of many contributors to ASF spread in feral pigs. Indirect transmission from infected carcasses, mechanical vectors and small-scale social structures of host populations may modulate transmission dynamics (eg young wild boar contact many individuals within a population and may contribute to transmission (EFSA AHAW Panel 2018)).

Spread of virus via carcasses is more important than spread via infected live animals for wild boar in Europe (Chenais et al 2019) (see 'Carcasses', below).

Most backyard pigs in rural and remote northern Australia are likely to be wild-caught feral pigs, which creates another means for human-assisted spread and spread across the feral–domestic pig interface.

Extrapolating from a disease modelling study (O'Neill et al 2020), the following elements apply in relation to infection with Georgia 2007 ASF virus in feral pigs:

- The feral pig population in an affected area will likely decline sharply by 60–70%.
- Current feral pig densities and population sizes may not be large enough to sustain the disease.
- Survivor pigs may play a role in persistence of ASF within feral pig populations, particularly where the transmission rate is low.
- In the hot northern Australian environment, ASF virus in carcasses is unlikely to remain viable for extended periods.
- In the cooler southern states, ASF virus may remain viable longer in infected feral pig carcasses. However, in general, the feral pig population is much smaller and less dense than in northern New South Wales and Queensland, so disease persistence within these populations is less likely.

Carcasses

ASF virus persists in blood and tissues for long periods after death. It is not inactivated by postmortem changes in pH, autolysis or putrefaction (Beltrán-Alcrudo et al 2017).

Probst et al (2017) suggested that the behaviour of wild boar towards pig carcasses may contribute to the spread of disease. They found that, in Germany, rooting and foraging behaviours around and underneath wild boar carcasses are more likely to contribute to disease transmission to susceptible wild boar than scavenging. Wild boar, regardless of their age, were possibly more interested in soil surrounding and underneath the carcasses than in the carcasses themselves. These authors also indicated that ASF virus transmission from contact with an infected carcass does not necessarily occur within the first days after the death of an infected wild boar, but may occur from carcasses in a more advanced state of decomposition.

Dead pigs drifting ashore in China (FAO 2019a) and Taiwan (FAO 2019b) tested positive to ASF virus, with 100% sequence matching to the ASF virus in mainland China. Accordingly, contaminated dead pigs (very unlikely) and pig products (unlikely) that wash up onto Australian shores represent a potential pathway of introduction to feral pigs that may scavenge them, or root and forage in contaminated soil and material around and under them.

Animal products

Meat and meat products, casings – including use as animal feed

ASF virus can remain viable for many months in a protein environment, such as raw, unprocessed, frozen meat (Penrith & Vosloo 2009). The virus has been recovered after 150 days from contaminated meat kept at 4 °C, after 104 days from meat kept at –4 °C, and after 188 days from bone marrow stored at –4 °C (MacDiarmid 1991). Dee et al (2018) simulated the intercontinental transport of ASF virus–contaminated materials, including moist cat and dog food and pork casings, and found that ASF virus remained viable following the 37-day trial at both 4–14 °C and 10–20 °C. Other studies have shown that ASF virus is sensitive to some combined treatments of heat, alkaline pH and peroxide that could be used during the production of spray-dried porcine plasma, which is used in the production of some animal feeds (Kalmar et al 2018).

Brining alone is insufficient to inactivate ASF virus in hams (MacDiarmid 1991). However, cooking pork to a well-done stage may inactivate the virus, provided it has been heated throughout to 100 °C for at least 30 minutes. Although dry-cured hams are not cooked, the amount of ASF virus in Parma, Serrano and Iberico hams dry-cured under specific conditions is significantly reduced by the 9–12-month curing process (Mebus et al 1997).

Viable virus has been recovered from putrefied serum stored at room temperature for 15 weeks, and from blood stored at 4 °C for 18 months to 6 years (Sánchez-Vizcaíno et al 2009, 2012).

In the 1985 outbreak in Belgium (Bironf et al 1987), the European Union required that pigmeat produced in the infected area be placed in hermetically sealed containers and held at a temperature of at least 60 °C for 4 hours, with at least 30 minutes of this period above 70 °C.

Animal byproducts

Hides, skins and trophies

ASF virus may be present in bristles and skin (including trophies) from infected pigs.

ASF virus in bristles may be inactivated by boiling for at least 30 minutes, or immersion for at least 24 hours in a solution of 1% formaldehyde (OIE 2018b).

ASF virus in skins may be inactivated by:

- boiling in water for long enough that matter other than bone, tusks and teeth are removed
- soaking with agitation in a 4% (w/v) solution of sodium carbonate (washing soda) maintained at pH 11.5 or above for at least 48 hours
- soaking with agitation in a formic acid solution (100 kg salt and 12 kg formic acid per 1000 L of water) maintained below pH 3.0 for at least 48 hours (wetting and dressing agents may be added)
- treating raw hides for at least 28 days with salt containing 2% sodium carbonate (washing soda), or treating with 1% formalin for a minimum of 6 days (OIE 2018b).

Swill/prohibited pig feed

Ingestion of pigmeat or pigmeat products infected with ASF virus is an important means of ASF virus spread, especially in the first outbreak in a country. Many ASF outbreaks that have occurred in ASF-free countries or zones were caused by feeding waste food products derived from infected pigs to domesticated pigs (Sánchez-Vizcaíno 2010). The first cases of ASF in Malta, Brazil and Sardinia were in swill-fed pigs close to international airports or seaports. The 2007 introduction

of ASF to Georgia is thought to have occurred from feeding waste at international harbours as swill (Rowlands et al 2008).

The nationally agreed prohibited pig feed definition lists 100 °C for 30 minutes as an approved process for treatment of swill.[12] This exceeds the OIE requirements for inactivation of ASF virus.

Semen and embryos from live susceptible animals

The OIE recommends measures to use against ASF virus when importing porcine genetic material, suggesting that the risk of transmission from these products is not negligible. Therefore, controls around their use and movement are included in this manual as a precautionary measure.

The International Embryo Transfer Society has indicated that there is not enough information to reach a conclusion about the risk of transmission of ASF virus via embryos.

Specimens

ASF virus may remain viable in laboratory specimens (eg frozen tissue samples from infected animals). However, these are not expected to play a role in the transmission of ASF.

Waste products and effluent

While specific information on ASF virus in waste and effluent is limited, the section 'Environment (including windborne spread)', above, contains general information on the viability of ASF virus in blood, urine and faeces.

Equipment, including personal items

Transfer of ASF virus by fomites, including bedding, feed, equipment, clothes and footwear, is a proven method of spread of ASF (Penrith & Vosloo 2009). People, especially those handling pigs or pig products (eg farm workers, abattoir workers, veterinarians), veterinary instruments (especially hypodermic needles) and vehicles that have carried infected pigs have all been implicated in transfer of virus (Wilkinson 1986). There is also the risk of disease spread through fomite transfer through vehicle movements, including stock trucks, feed trucks and visitor vehicles that drive through contaminated roadways.

Krug et al (2018) explored the disinfection of ASF virus on steel, plastic and concrete surfaces, which are commonly found in pork packing plants. They found that dried blood on equipment strongly reduced the efficacy of sodium hypochlorite. This reinforces the need for surfaces to be adequately cleaned to remove organic material before being disinfected.

Arthropod vectors

In Africa, ASF virus is maintained in a sylvatic cycle involving warthogs and argasid (soft) ticks of the *Ornithodoros moubata* complex (which are found in warthog burrows). Trans-stadial and transovarial transmission of the virus occurs in these ticks (Bellini et al 2016, Spickler 2018). Transmission between *O. moubata* complex ticks and domestic pigs is also known to occur in parts of Africa (as a tick–pig cycle). The same may apply to transmission of ASF virus in wild boar in Europe (Costard et al 2013; Guinat et al 2016a, cited in Schulz et al 2017). *Ornithodoros* ticks play an important role in maintaining infection but are not thought to contribute to the geographical spread of the virus (Bellini et al 2016).

[12] https://animalhealthaustralia.com.au/?s=prohibited+pig+feed

On the Iberian Peninsula, the soft tick *Carios erraticus* (formerly *O. erraticus*) contributed to transmission of the disease in outdoor pig production systems and served as a reservoir of virus for 1 year in previously infected areas that had been depopulated. This resulted in persistence of the virus for 5 years (Boinas et al 2011). Trans-stadial, but not transovarial, transmission has been demonstrated in *C. erraticus* (EFSA AHAW Panel 2010).

The role of argasid ticks in other regions is either less important or has not been demonstrated. The only *Ornithodoros* ticks present in Australia are the kangaroo soft tick (*O. gurneyi*), the penguin tick (*O. capensis*) and *O. macmillani*, which has been found in tree hollows and nests of Australian cockatoos (Barker et al 2014). None of these ticks are known to feed on pigs.

Although the ornate kangaroo tick (*Amblyomma triguttatum*) is found on pigs, there is no evidence that ixodid (hard) ticks such as this are involved in transmission of ASF virus (de Carvalho Ferreira et al 2014, Spickler 2018).

Bloodsucking insects such as mosquitoes and biting flies (eg tabanids, *Stomoxys calcitrans*) may be involved in disease transmission. Olesen et al (2018b) suggested that *S. calcitrans* feeding on viraemic pigs may cause the mechanical spread of ASF within herds, and possibly between herds as a result of its flight range of 3.2 km, which may extend to 29 km, based on laboratory extrapolations (Bailey et al 1973). Such insects can carry high levels of virus for 2 days (Mellor et al 1987). *S. calcitrans* can transport infectious virus for at least 12 hours, and DNA can be detected in fly bodies up to 36 hours postfeeding (Olesen et al 2018b).

Oleson et al (2018c) found that, in addition to *S. calcitrans* acting as a mechanical vector of ASF virus (Mellor et al 1987), infection may occur in pigs orally ingesting flies fed blood contaminated with ASF virus. In this experiment, pigs that ingested 20 blood-fed flies transmitted the disease.

The laboratory study findings of Oleson et al (2018c) and Bailey et al (1973) suggest that ingestion of biting flies that had fed on contaminated blood serves as a potential source of infection between naive pig herds/populations.

A strong seasonality of ASF outbreaks in domestic pigs, with a peak in summer, was observed in Estonia, Latvia, Lithuania and Poland. A similar seasonal activity of biting insects was seen, raising the question of whether biting insects have a role in ASF transmission (Miteva et al 2020). Further research is required to understand the role of biting insects in ASF transmission.

In a 2020 review, Blome et al considered that biting insects have limited involvement in disease transmission between holdings or areas. Nevertheless, within a pen or shed on the same farm, or a smaller affected region, their role cannot be excluded (although it is unlikely).

People

ASF is not zoonotic, but people may contribute to the mechanical transmission of ASF virus between pigs by the movement of contaminated clothing, footwear, equipment and so on, as well as by shedding virus particles from the skin (including nasal passages).

In addition, human-assisted movements of live infected pigs and contaminated pig products are key transmission pathways between domestic pig herds and feral pig populations.

2.4.3 Factors influencing transmission

In Europe, ASF was reported to spread at a rate of approximately 1–3 km per month in wild boar (ProMED-mail 2019), but it is not known if this is relevant under Australian conditions. Human-

associated movements of infected pigs and/or contaminated pork products, and subsequent feeding of them to pigs in Europe and China, are believed to have contributed to the spread of ASF over large distances in short timeframes.

Transmission appears to be less effective by indirect contact than by direct contact with infected animals (Pietschmann et al 2015, Guinat et al 2016a,b).

2.5 Diagnostic criteria

2.5.1 Clinical signs

ASF is a highly variable disease, with several forms. The variability is largely due to differences in virulence among the many strains of the virus, but may also be influenced by host age, the amount of inoculum and the level of herd immunity.

Clinical findings of the various forms of the disease are drawn from the published literature and presented below. Extreme mortality rates and fever in pigs of all ages signal a highly virulent disease in a naive herd.

Large numbers of pigs may become infected simultaneously and display a range of clinical signs depending on the stage of infection, severity of the disease process and virulence of the virus.

Early diagnosis of an outbreak may be delayed if ASF is present in the mild form, or if the initial infections are in small pig herds or feral pigs.

Peracute form

Pigs may be found dead with no prior clinical signs.

Acute form

Clinical signs include high fever (40.5–42 °C), abortion in pregnant sows, depression, listlessness, cyanosis, anorexia, vomiting, diarrhoea, haemorrhages in the skin (redness of skin on ears, abdomen and legs), death in 6–13 days (but sometimes up to 20 days) and mortality rates up to 100%.

Subacute and chronic forms

Moderately virulent or low-virulent viruses may show less intense clinical signs for much longer (5–30 days).

Clinical signs include weight loss, arthritis, intermittent fever, death in 15–45 days, respiratory signs, mortality rates in the range 30–70% and chronic skin ulcers.

2.5.2 Pathology

Peracute form

There may not be many postmortem findings because the pigs may die before any gross pathology is seen.

Acute form (not all lesions are seen, depending on the isolate)

Findings may include:

- pronounced haemorrhages in the gastrohepatic and renal lymph nodes
- perirenal oedema

- petechiae of the renal cortex, medulla and pelvis
- congestive splenomegaly
- oedematous areas of cyanosis in hairless parts
- cutaneous ecchymoses on the legs and abdomen
- excess of pleural, pericardial and/or peritoneal fluid
- petechiae in the mucous membranes of the larynx and bladder, and on visceral surfaces of organs
- oedema in the wall of the gall bladder and mesenteric structures of the colon, and adjacent to the gall bladder.

Subacute and chronic form

Findings may include:

- focal caseous necrosis and mineralisation of the lungs
- enlarged lymph nodes.

Microscopic lesions

Extensive necrosis of lymphatic tissue is common and may be accompanied by haemorrhage and karyorrhexis of granular lymphocytes (nuclear fragmentation and degeneration). Necrosis is more severe and frequent with ASF than with CSF. There is vasculitis, with degeneration of endothelium and fibrinoid degeneration of artery walls in all organs. There is nonsuppurative inflammation of the brain, spinal cord and spinal nerves.

Pathogenesis

The pathogenesis of ASF virus was reviewed by Blome et al (2013). In pigs, the virus replicates in the mononuclear phagocyte system,[13] particularly in monocytes and macrophages. Massive destruction of macrophages is thought to play a major role in the pathogenesis of the disease. Different virus isolates show no general differences in cell tropism or organ distribution; however, a significant increase in the severity of tissue destruction is seen with increasing virulence (Oura et al 1998).

2.5.3 Differential diagnosis

The following diseases and conditions should be considered in a differential diagnosis of ASF:

- CSF
- Aujeszky's disease
- *Actinobacillus pleuropneumoniae* infection
- erysipelas
- salmonellosis
- various poisons, including warfarin
- pasteurellosis/pneumonia

[13] Previously known as the reticuloendoethelial system.

- mulberry heart disease
- isoimmune thrombocytopenic purpura
- viral encephalomyelitis
- porcine reproductive and respiratory syndrome
- porcine dermatitis and nephropathy syndrome.

2.5.4 Laboratory tests

Because of the considerable overlap in the clinical and pathological signs seen in ASF and many other pig diseases, the diagnosis needs to be confirmed by identification and characterisation of the causative virus. Relevant laboratory tests should be done to exclude the principal differential diagnoses.

If an outbreak is confirmed to be caused by ASF virus, regulatory requirements (eg for handling and reporting) apply because this agent is classified as a Security Sensitive Biological Agent (SSBA).[14] However, emergency situations, including emergency animal disease outbreaks, can be exempted from some SSBA regulatory requirements. Clarification should be sought from the SSBA officer at the facility concerned.

Samples required

Specimens required for identifying the agent, serological testing and histopathology are as follows:

- identifying the agent
  - whole blood from live, suspect animals in EDTA anticoagulant
  - unpreserved tissues collected aseptically at postmortem – tonsils, spleen, lymph nodes, lung, kidney and bone marrow
  - swabs from the oral cavity, tonsils and nasal cavity (from either live or dead pigs), placed in viral transport media
- serological testing
  - sera from animals suspected of having subacute or chronic disease
- histopathology
  - a full range of tissues in neutral-buffered formalin.

Tissue samples should be taken from affected pigs that have been killed and from pigs that have recently died. To minimise the risk of contamination, tissue samples should be taken during postmortem examination as aseptically as possible and without delay.

Sampling feral pigs

Sampling wild or feral animals can present several challenges that make the usual approach to sampling impracticable. Remote locations, lack of a cold chain, animals found dead and in varying states of decomposition, and untrained operators are all potential limitations.

Conventional approaches to sampling are always preferred where possible. However, to ensure that testing can proceed under challenging circumstances, alternative approaches can be used. Sampling of blood or peritoneal fluid from animals found (recently) dead or shot is expected to

[14] www.health.gov.au/SSBA

be enough to detect acute infection. Intact long bones from dead or decomposed animals can also be submitted for extraction and testing of bone marrow, where the virus can be preserved for long periods.

The alternative methods have performed adequately in surveillance of wild suids in a number of countries (Randriamparany et al 2016, Carlson et al 2018), but lack the full validation of conventional methods and may lack some sensitivity in practice. If conventional approaches to sampling are not available, swab sampling in viral transport media is preferred to card-based methods.

Proprietary swabs such as those from PrimeStore, COPAN eNAT, COPAN FLOQSwab and GenoTube Livestock, or Whatman FTA cards, provide a method for sample collection that may inactivate, stabilise and preserve viral DNA without the need to refrigerate the sample.

Some swabs are used dry, and others contain a liquid chemical preservative.

The manufacturer of the GenoTube swab recommends that samples be stored between 15 °C and 30 °C, which can be a challenge in field environments with temperatures consistently over 30 °C.

It is important to be aware that, although some of these sampling systems claim inactivation of the agent (some do not), this capability should not be assumed to be 100% effective. Adequate biosecurity measures must be taken in transporting all samples, regardless of whether the sampling system claims inactivation.

Transport of specimens

Specimens should be submitted in accordance with agreed state or territory protocols. Specimens should initially be forwarded to the state or territory laboratory for appropriate analysis, and assessment of whether further analysis will be required by the CSIRO Australian Centre for Disease Preparedness (CSIRO-ACDP), Geelong.

If the state or territory laboratory deems it necessary, duplicate samples of the specimens should be forwarded to CSIRO-ACDP for emergency disease testing, after the necessary clearance has been obtained from the chief veterinary officer (CVO) of the state or territory of the suspect case, and after the CVOs of Victoria and Australia have been informed about the case and the transport of the specimens to Geelong (for the first case). Sample packaging and consignment for delivery to CSIRO-ACDP should be coordinated by the relevant state or territory laboratory.

For further information, see the **AUSVETPLAN management manual *Laboratory preparedness***.

Packing specimens for transport

Blood samples and unpreserved tissue specimens should be chilled and transported with frozen gel packs. Samples submitted as GenoTube swabs or FTA cards will not require chilling. For further information, see the **AUSVETPLAN management manual *Laboratory preparedness***.

2.5.5 Laboratory diagnosis

The initial approach to ASF diagnosis is screening by real-time PCR (qPCR), as this method is rapid and sensitive, and can be scaled up readily if required. An antigen ELISA is also available, although rarely used. Virus isolation will be attempted. Further characterisation and genotyping by sequence analysis can be carried out on primary samples or on isolates.

Serology is also available. Although antibody serology generally plays a minor role in the initial diagnosis, it is likely to be used to define the nature and extent of any outbreak, and in the proof-of-freedom phase.

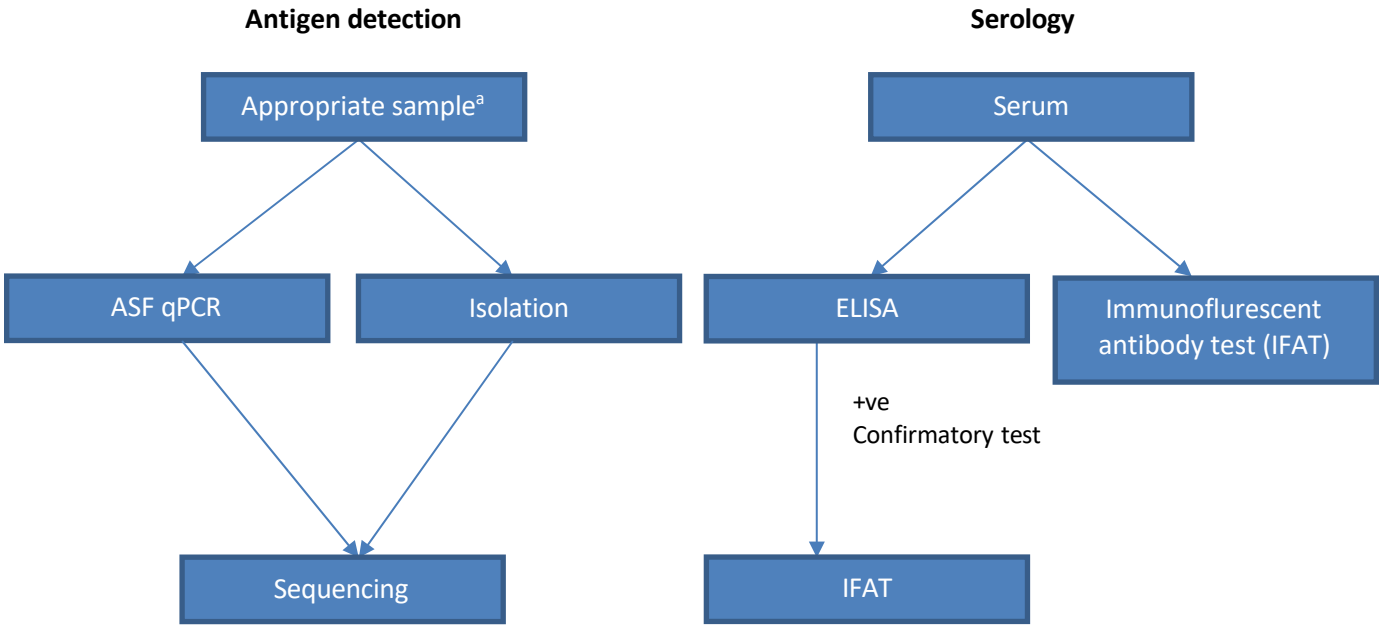
LEADDR

The role of the Laboratories for Emergency Animal Disease Diagnosis and Response (LEADDR) network is to provide frontline screening capability at jurisdictional laboratories. The network will also play a role in reviewing initial and ongoing laboratory findings, including test results, and providing advice to the Consultative Committee on Emergency Animal Diseases and its working groups on follow-up laboratory needs and strategies.

CSIRO-ACDP tests

The testing algorithm used by CSIRO-ACDP is shown in Figure 2.1. Further details of tests currently available at CSIRO-ACDP are shown in Table 2.3.

Figure 2.1 Current approach to diagnostic testing for ASF at CSIRO-ACDP



a Ideally, EDTA blood or postmortem samples (spleen, lymph node, tonsil, kidney). Other possible samples include tissue- or swab-based sampling systems such as PrimeStore and GenoTube, or paper-based approaches such as FTA cards and 3MM filter paper.

Table 2.3 Laboratory tests currently available at CSIRO-ACDP for diagnosis of African swine fever

Test	Specimen required	Test detects	Time taken to obtain result
Agent detection			
qPCR	EDTA blood/tissue	Viral genome	<1 day
Virus isolation	EDTA blood/tissue	Virus	1–2 weeks
ELISA	EDTA blood/tissue	Antigen	1 day
Agent characterisation			
PCR and sequencing (genotyping)	EDTA blood/tissue/virus isolate	Viral genome	2–3 days
Serology			
ELISA	Serum	Antibody	1 day
IFAT	Serum	Antibody	1 day

EDTA = ethylenediaminetetraacetic acid; ELISA = enzyme-linked immunosorbent assay; IFAT = immunofluorescent antibody test; PCR = polymerase chain reaction; qPCR = real-time PCR
Source: Information provided by CSIRO-ACDP, 2021 (refer to CSIRO-ACDP for most up-to-date information).

2.6 Resistance and immunity

The large variation in the clinical and pathological picture of ASF in different parts of the world is mainly due to variations in virulence of different strains of the virus, rather than to differences in the immune status of the pig population.

Approximately 40% of the pig population surveyed in Mozambique demonstrated some degree of innate resistance, with a broad range of variation (Penrith et al 2004). This may simply be a function of virus evolution in a population over a sustained period.

Infection with ASF virus genotype 2 (currently circulating in Eurasia) typically leads to a peracute or acute infection, with close to 100% individual mortality 1–10 days following exposure (EFSA 2014, Sánchez-Vizcaíno et al 2015). A less common form of infection is possible, where individuals develop a persistent infection that may be accompanied by signs of subacute or chronic disease, invariably leading to death. Animals have the potential to excrete virus in association with the resurgence of viraemia several months post-infection (Ståhl et al 2019).

Infection with the low-virulent or moderately virulent Netherlands ’86 strain of ASF virus identified a 70% mortality rate (Eblé et al 2019). Eblé et al (2019) and Gallardo et al (2015) found that chronically (or subchronically) infected domestic pigs could transmit the infection through contact with susceptible pigs, leading to acute infection up to 72 days post-inoculation. However, other studies (Gallardo et al 2018, Petrov et al 2018) found that infection could not be transmitted from survivors to sentinels.

2.6.1 Survivor pigs

There is no definition in the literature of an ASF virus carrier pig. Rather, the term ‘carrier’ seems to have been used to imply ‘survivor’. Ståhl et al (2019) applied the term ‘survivor’ to individuals

that survive the initial ASF infection. Survivor is the term adopted by this AUSVETPLAN response strategy.

According to Ståhl et al (2019), there are two types of 'survivors':

- '… chronically infected pigs which eventually will succumb to the disease, and which may excrete virus in association with resurgence of viraemia and, in most cases, reappearance of clinical signs of the disease. These infections have generally been associated with low virulent, often non-haemadsorbing viruses.
- pigs which clear the infection independently of virulence of the virus, and which possibly are more common in some pig populations. These pigs are not persistently infected and will not present with prolonged virus excretion beyond 30 to 40 days in the majority of cases ...'

The proportion of survivors is variable and is higher with less virulent viruses (Sánchez Botija 1962, Hess 1981).

In reviewing both epidemiological and experimental studies, Ståhl et al (2019) could find no evidence for any significant role for survivors of ASF virus infection in the epidemiology of the disease.

However, a recent study on ASF virus infection transmission and persistence in wild boar (O'Neill et al 2020) used modelling to demonstrate two key factors: environmental transmission from infected carcasses is important in producing a disease outbreak, and the rate of transmission is important to the disease persisting in low-density wild boar populations. To explain the persistence of the disease in the wild boar population in the field in the face of highly virulent ASF virus challenge, the disease model had to be adjusted to include survivors at a rate of 1–3%.

It is possible that there are other explanations for why the model did not fit the data unless survivor pigs were included in the modelling. Further research is required to better understand the role of survivor pigs in the epidemiology of the disease.

Based on a study in Spain, and extrapolating to the Australian context, outbreaks in the wild will likely be driven by environmental contamination from infected feral pig carcasses. However, a rapid decrease in population numbers may result in reduced spread of ASF virus in the environment (O'Neill et al 2020). Disease modelling suggests that scavengers are likely to help the degradation of carcasses rather than assist spread of ASF virus (O'Neill et al 2020).

2.7 Vaccination

There is currently no commercially available vaccine for ASF. This is primarily due to the complexity of the immune response to this virus (Sánchez-Vizcaíno et al 2009).

2.8 Treatment of infected animals

There is no effective treatment for infected animals. Palliative treatment may alleviate the clinical signs, but will not prevent the spread of infection and may make the detection of infected animals more difficult. Infected animals will be triaged for destruction.

2.9 Control overseas

In Malta and the Dominican Republic, ASF was eradicated by the total elimination of pigs from both countries (Geering et al 1995).

Other measures used and recommended for successful eradication overseas include destruction of infected and in-contact animals, sanitary carcass disposal, disinfection of infected premises and contaminated items, quarantine and movement controls, and prevention of contact between wild suids and domestic pigs (FAO 2009).

Preventive measures to mitigate the spread of ASF in pig farming systems were reviewed by Bellini et al (2016). The study identified the following disease pathways for transmission of ASF:

- direct pig-to-pig contact
- consumption of contaminated feed (swill feeding)
- vehicles and other fomites, such as clothing, footwear and surgical equipment
- workers and visitors
- slurry
- genetic materials
- bites from ticks.

Although not included by Bellini et al (2016), bloodsucking insects such as mosquitoes and biting flies (eg tabanids, *Stomoxys calcitrans*) have been suggested to be involved in disease transmission (see 'Arthropod vectors' in Section 2.4.2).

To address and mitigate these disease pathways, the following measures have been used in eradication programs:

- physical isolation of infected herds
- appropriate movement controls on animals, products, people, vehicles, equipment and so on
- appropriate disposal of carcasses, manure, bedding material and slurry
- ban on swill feeding.

Where ASF virus was present in ticks (on the Iberian Peninsula), eradication of the virus from domestic pig populations took decades. Pig housing that was identified to contain infected ticks was destroyed or isolated as part of this eradication campaign (Spickler 2018).

In the 2018 outbreak in the Czech Republic, authorities managed to prevent introduction of ASF to their domestic pig population, and to control and eradicate the disease from wild boar. Measures implemented included compulsory notification of all dead pigs in the infected area, movement controls, a ban on backyard pigs in the infected area, active search and removal of wild boar carcasses, intensive hunting of wild boar by trained hunters, laboratory investigation of all dead and hunted wild boar, and safe disposal of dead wild boar using rendering (Czech Republic State Veterinary Administration 2018).

The European Food Safety Authority Panel on Animal Health and Welfare suggested using different wild boar management strategies at different stages of an ASF outbreak (EFSA AHAW Panel 2018). The authors proposed the following:

- In the early stages of an outbreak, keep populations in the infected area undisturbed (eg ban hunting, stop harvesting crops) to minimise dispersal of animals, and drastically reduce the wild boar population in surrounding uninfected areas. Passive surveillance (through collection of carcasses) should be used to monitor the epidemic.

- As the epidemic decreases, reconsider more active population management measures such as culling to reduce populations.

3 Implications for Australia

3.1 Potential pathways of introduction

Potential routes for the introduction of African swine fever (ASF) into Australia include the importation or arrival of:

- contaminated pork and pork products
- contaminated porcine genetic material
- contaminated fomites
- infected pigs or pig carcases.

Since Australia has strict import conditions in place, the introduction of ASF through the legal importation of these commodities is very unlikely. However, the illegal introduction of contaminated pork or pork products that are illegally fed to pigs or accessed by pigs poses a significant risk.

3.2 Social and economic effects

Economic impacts from an incident of ASF in Australia would result from disease-induced mortalities, production losses, costs and losses resulting from domestic market disruptions, decreased consumer confidence, export market losses and disease control costs such as welfare slaughter. Businesses may be forced to euthanase pigs for welfare purposes or movement restrictions that impede movements between farms or to slaughter.

Industries associated with the pig production supply chain (eg grain production industry) or related industries (eg game meat industry) would be affected. It has been estimated that total sales revenue losses to the Australian pig industry would be $409.4 million over 3 years for a single-point outbreak, and $839.5 million over 5 years for a large, multipoint outbreak (ACIL Allen Consulting 2019). Similarly, lost primary and secondary processing costs are estimated to be $349 million and $919 million, respectively.

Trade in products from non-ASF-susceptible species (eg beef, sheep meat, horse meat, some rendered meals) may be jeopardised because of ASF in feral or domestic pig populations and international phytosanitary agreements requiring freedom from ASF.

Social impacts of an outbreak may arise from loss of livelihoods, loss of animals, loss of recreational activities (eg pig hunting), uncertainty around future earnings and the stigma associated with the disease. There will also be concerns about the welfare of affected animal populations, the ethics of destroying large numbers of uninfected pigs and the humaneness of the response measures applied to them. These factors may affect the mental health of individuals and lead to substantial economic impacts in areas with a heavy reliance on pig production. Indigenous communities that use feral pigs as a source of food may also be affected.

3.3 Critical factors for response

The critical factors for a response to ASF in Australia include the following (also refer to Appendix 4 for more detail):

- ASF is a highly variable disease. It can vary from disease with high morbidity and high case mortality to a very mild disease.
- Given the similarity of ASF to many endemic diseases, laboratory confirmation is required for diagnosis.
- ASF virus is shed in high concentrations in secretions and excretions containing blood during the acute phase of the disease.
- Pigs infected by mild virus strains or surviving acute disease may shed virus for more than 1 month following recovery.
- All domestic and feral pig species present in Australia are susceptible to infection.
- Early diagnosis will be limited by speed of early detection in cases of mild genotypes, slow response to clinical signs, and speed of sampling and dispatch to certified diagnostic laboratories. The frequency and volume of national pig movements in the pork industry are sufficiently high that a delay in early detection and diagnosis may be associated with substantial spread of the disease, including across jurisdictions and involving processing facilities.
- Transmission of ASF in Australia will most likely occur via the movement of animals, animal products and fomites spread by vehicles and people with accessibility to pigs. ASF virus is less likely to be transmitted over long distances without human assistance.
- No vaccine or effective treatment is available.
- There are no public health implications.
- Movement of the virus by fomites (including trucks) has been proven.
- ASF virus may remain viable for extended periods under some Australian environmental conditions (eg in cooler, wetter areas).
- Cleaning of pig pens and removal of all animal secretions and excretions (eg faeces, urine, blood) is essential if the pens are to be disinfected. Conversely, natural degradation of the virus can be expected without cleaning and disinfection; however, the time for this to occur is highly variable.
- Aerosols do not play a significant role in disease transmission between herds, but are important for transmission within herds and between animals in close contact.
- Trade in animal products will be affected.

4 Policy and rationale

4.1 Introduction

African swine fever (ASF) is a World Organisation for Animal Health (OIE)–listed disease that has the potential for rapid spread, causing significant production losses. It is of major importance in international trade in pigs and pig products.

4.1.1 Summary of policy

The default policy is to contain, control and eradicate ASF in the shortest possible time, while minimising social and financial disruption, using a stamping-out policy.

This approach will be supported by a combination of strategies, including:

- an *immediate epidemiological assessment* of the situation
- *rapid recognition* and *laboratory confirmation* of cases
- *implementation of legislated declared areas* for disease control purposes
- *application of biosecurity (including quarantine) and movement controls* over susceptible animals, animal products and byproducts, and fomites – supported by a robust permit system – to minimise spread of infection
- *tracing and surveillance* to help determine the source and extent of infection (including, as necessary, in feral pigs)
- *valuation for compensation*, followed by destruction and disposal of pigs, property and things on infected premises (IPs), and of other high-risk pigs, property and things, based on a *risk assessment*
- *sanitary disposal* of infected pigs, products and byproducts that are not suitable for treatment to inactivate the virus
- *decontamination* of IPs, dangerous contact premises (DCPs), dangerous contact processing facilities (DCPFs) and approved disposal sites (ADSs)
- *decontamination and/or disposal of fomites* to eliminate the virus
- proactive *management of animal welfare issues* that arise from the disease or the implementation of disease control measures
- *recall* of animal products likely to be contaminated (unless deemed unnecessary by a risk assessment)
- *surveillance and control* of feral animal populations, as appropriate
- *surveillance of tick vector populations*, if implicated in the epidemiology of the incident
- *relief and recovery programs* to minimise animal welfare and human socioeconomic issues that could inhibit the effectiveness of the response
- a *public awareness campaign*, including food safety messaging
- *industry support* to improve understanding of the issues, facilitate cooperation and address animal welfare issues.

Additional measures that may be used, if warranted, to minimise impacts on industry and manage the outbreak include zoning and compartmentalisation.

4.1.2 Case definition

For the purpose of this manual, a case of ASF is defined as laboratory-confirmed infection with ASF virus in a pig.

Notes:

- Positive serology in the absence of genome or antigen does not constitute a case but warrants further investigation to determine if there is evidence of infection.
- AUSVETPLAN case definitions guide when a response to an emergency animal disease (EAD) incident should be undertaken. AUSVETPLAN case definitions do not determine when international reporting of an EAD incident is required.
- At the time of an outbreak, revised or subsequent case definitions may be developed with the agreement of the Consultative Committee on Emergency Animals Diseases (CCEAD).

Information on the laboratory confirmation of infection is provided in Section 2.5.4.

4.1.3 Cost-sharing arrangement

In Australia, ASF is a Category 3 EAD in the Government and Livestock Industry Cost Sharing Deed in Respect of Emergency Animal Disease Responses (EAD Response Agreement – EADRA).[15] When cost sharing of the eligible response costs of an incident is agreed, Category 3 diseases are those for which costs will be shared 50% by government and 50% by industry.

4.1.4 Criteria for proof of freedom

Any approach to declaring proof of freedom should be based on the OIE *Terrestrial animal health code* chapters on ASF (Chapter 15.1) and animal health surveillance (Chapter 1.4).

See Section 7 for details on establishing proof of freedom.

4.1.5 Governance

Governance arrangements for the response to EADs are outlined in the **AUSVETPLAN *Overview***.

Information on the responsibilities of a state coordination centre and local control centre is available in the **AUSVETPLAN management manual *Control centres management* (Parts 1 and 2)**.

4.2 Public health implications

ASF virus does not infect humans. Pork products remain safe for human consumption.

[15] Information about the EAD Response Agreement can be found at https://animalhealthaustralia.com.au/eadra.

4.3 Control and eradication policy

The policy is to contain, control and eradicate ASF through stamping out, and to re-establish the ASF-free status of Australia as quickly as possible. Destruction, disposal and decontamination activities will be carried out in association with movement controls, tracing and surveillance. Zoning and compartmentalisation (see Section 4.3.4) may be used, where appropriate. The selected strategies will take into account that the disease is spread by direct contact with infected pigs and ingestion of contaminated products, by indirect contact with fomites and mechanical vectors (including insects such as biting flies and mosquitoes), and, in some environments, by biological vectors such as ticks.

A stamping-out policy is preferred because international experience has shown it to be effective. This approach also enables a more rapid return to freedom from ASF under the guidelines of the OIE *Terrestrial animal health code.*

Within this overall policy, the strategies selected will depend on a thorough assessment of the epidemiological situation at the time. They will need to be reassessed during an outbreak and altered if necessary.

4.3.1 Epidemiological assessment

Epidemiological investigation or assessment draws on multiple sources of information to build understanding of the disease and how it is behaving in an outbreak. This helps inform response decision making.

In the initial response to ASF, the key objectives for an epidemiological assessment will be to identify:

- the spatial distribution of infected and noninfected (domestic and feral) animal populations
- potential vectors involved
- virulence and phylogenetics of the virus strain present (to aid identification of the source)
- the likely or confirmed source of infection
- pathways of spread and their risk profiles
- traceability data of pigs, pig products and fomites
- the likely silent spread phase, the likely extent of spread, the size of the outbreak and the slope of the epidemic curve (and estimated dissemination ratio), using modelling where available
- risk factors for the presence and likelihood of infection, disease spread and susceptibility to disease (eg weather, vectors, feral pig populations, interactions between feral pig populations and kept pig populations, on-farm biosecurity, quality of movement records).

Epidemiological assessment, and tracing and surveillance activities (see Section 4.3.3) in an EAD response are interrelated activities. Early findings from tracing and surveillance will be inputs into the initial epidemiological assessment (eg considering the spatial distribution of infection). The outcomes of the initial epidemiological assessment will then guide decisions on subsequent tracing and surveillance priorities.

The outcomes of the epidemiological assessment will also be used to guide the selection of other appropriate response measures (including the application of movement controls) and assess the progress of disease control measures.

Ongoing epidemiological assessment is important for any EAD response to aid evaluation of the continued effectiveness and value of response measures. Ongoing epidemiological assessment will consider the outcomes of tracing and surveillance activities, and will contribute evidence to support any later claims of disease freedom.

4.3.2 Biosecurity (including quarantine) and movement controls

Detailed guidelines for classifying (and reclassifying) declared areas and premises are provided in the **AUSVETPLAN guidance document *Declared areas and allocation of premises definitions in an EAD response***.

In a response to ASF, biosecurity (including quarantine) and movement controls will be immediately imposed on all premises and declared areas on which infection or contamination with ASF virus is either known or suspected.

In accordance with Section 6, controls may be placed on the movement of infected or potentially infected pigs, and contaminated or potentially contaminated things (including pig semen and embryos; pig products and byproducts; vehicles; equipment; people; nonsusceptible animals; crops, grains, hay, silage and mixed feeds; and manure/effluent).

Biosecurity controls to prevent contact between feral and domestic pigs should be implemented to avoid infection of domestic pigs from feral pigs and vice versa.

Human-assisted movements of feral pig and associated fomites (eg hunting equipment) will be controlled to prevent seeding of ASF virus from infected areas to uninfected areas.

Aggregations of live pigs at pig shows and pig saleyards will be prohibited in the restricted area (RA). Operation of saleyards in the control area (CA) and outside area (OA) should be at the discretion of the jurisdiction.

Pig scale operations should not operate in the RA. Those within the CA and the OA should be at the discretion of the jurisdiction. If they are allowed to operate, the pigs must be for 'slaughter only'. Abattoirs that do not meet minimum standards will not be allowed to operate in any of the declared areas (RAs and CAs), or to receive pigs from declared areas.

Optimal biosecurity controls and enhancements will be encouraged on all pig premises, including those outside declared areas (infected area (IA), RA and CA). The *National farm biosecurity manual for pork production*[16] provides guidelines for pig producers on both routine and high-risk biosecurity procedures. The **AUSVETPLAN enterprise manual *Pig industry*** provides additional details on the biosecurity and other response measures that may be used on pig premises in an EAD response.

Section 5 provides details on the use of declared premises and areas, and on reclassifying premises and areas.

[16] www.farmbiosecurity.com.au/toolkit/plans-manuals

Section 6 provides details on movement controls to prevent further spread of ASF virus.

Biosafety and biosecurity for personnel

Specific human biosafety measures are not required for ASF because it is not a zoonotic disease.

Stringent biosecurity measures to manage the movements of people onto and off premises will be important for controlling ASF. Movements of personnel onto or off high-risk premises (IPs, DCPs, DCPFs, suspect premises – SPs, trace premises – TPs, and ADSs) should be limited, where possible.

Personnel involved in handling pigs and/or potentially contaminated items or areas (eg people involved in sampling pigs, or their products or byproducts, or in destruction, disposal and decontamination activities) on high-risk premises (IPs, DCPs, DCPFs, SPs, TPs and ADSs) should be considered contaminated. These may include response personnel, farm personnel and truck drivers.

All potentially contaminated personnel should shower (including washing hair) before entering and after leaving premises, with complete clothing changes. If showering facilities are not available on-site, showering may occur elsewhere but should occur as soon as practicable after leaving the premises.

Farm-specific boots and overalls should be used. Decontamination of farm-specific footwear after each use and hot laundering (≥60 °C) of used overalls is required. These requirements should also be met by workers and drivers entering and leaving processing facilities that handle pigs from IPs, DCPs, SPs and TPs (ie approved processing facilities – APFs, and DCPFs).

On farm, personnel should work a 'one-way flow' from clean areas to dirtier areas within a production shed. Sharing of personnel between production sheds (or production units within a shed) is not recommended.

Biosecurity for equipment

Stringent biosecurity measures to manage the movements of equipment, vehicles and other things onto and off premises will be important for controlling ASF.

Movements of vehicles and equipment onto or off high-risk premises (IPs, DCPs, DCPFs, SPs, TPs and ADSs) should be limited, where possible. Where possible, loading facilities and feed bins should be near perimeter fencing (with shuttles to the main feed storage, etc), to limit vehicles moving onto premises.

Equipment to be used in handling pigs and/or potentially contaminated items or areas (eg in sampling of pigs, or their products and byproducts; or in destruction, disposal and decontamination activities) on high-risk premises (IPs, DCPs, DCPFs, SPs, TPs and ADSs) should be considered contaminated and either disposed of on-site (see Section 4.3.10) or decontaminated (see Section 4.3.11).

Nonreusable equipment should be disposed of in a biosecure manner (eg incineration, commercial hazardous biological waste program). Reusable equipment (including vehicles) should be decontaminated (see the **AUSVETPLAN operational manual *Decontamination***) on exit from the premises (or at an approved 'receiving' premises).

4.3.3 Tracing and surveillance – domestic pigs

Guidance on tracing and surveillance can be found in the **AUSVETPLAN guidance document *Tracing and surveillance***.

Tracing

Rapid trace-forward (spread tracing) and trace-back (source tracing) of risk animals and items from IPs will help identify the source of the disease, the primary case(s), and the location of potentially infected animals and contaminated items. This will help identify the origin of the outbreak and define the potential extent of disease spread.

It is important to estimate the date when ASF virus is likely to have been introduced onto each IP, because this date will be used for forward and backward tracing. In the initial stages of an outbreak, an estimated date of introduction to a premises may not yet have been determined or the epidemiological investigation may be inconclusive. In these cases, tracing should consider movements onto and off IPs from a minimum of 15 days before the first appearance of clinical signs on the IP (representing the OIE incubation period and the priority timeframe) up until the time that effective quarantine was imposed on the IP.

Traces should be prioritised based on a risk assessment, with emphasis on the following movements:

- Off the IP (ie trace-forward). This should be for 2 days before the first appearance of clinical signs on the IP for fomites (recognising that animals may shed virus for 2 days before demonstrating clinical signs) and 15 days (one incubation period) before the first appearance of clinical signs on the IP for live pigs; tracing should cover the period up until the time that effective quarantine was imposed on the IP. Where resources are limited, these periods may be shortened based on a risk assessment. For example, if the date of onset of clinical signs is accurately known, the emphasis will be on trace-forward from 2 days before the onset of signs. As resources allow, and as a precautionary measure, further trace-forward of live pig movements off the IP for 30 days before the first appearance of clinical signs on the IP up until the time that effective quarantine was imposed on the IP is ideal.
- Onto the IP (ie trace-back). This should be for 15 days (one incubation period) before the first appearance of clinical signs on the IP up until the time that effective quarantine was imposed on the IP. Where resources are limited, this period may be shortened based on a risk assessment. For example, if the date of onset of clinical signs is accurately known, the emphasis will be on trace-back from 2 days before the onset of signs. Trace-back to 30 days (ie two incubation periods) before the first appearance of clinical signs on the IP up until the time that effective quarantine was imposed in the IP is ideal.

Tracing should be prioritised according to risk and include:

- pigs
- vehicles, including livestock transport vehicles, feed trucks, farm visitors' cars, quad bikes, vehicles from utility companies (eg electricity, gas), local government cars (eg rangers), and other rural industry vehicles such as those of forestry contractors
- people, including workers, people who live on the property and visitors such as veterinarians, vehicle drivers, sales and feed representatives, tradespeople, technicians, visitors and other rural industry contractors

- animal products, including meat (chilled, frozen, bone-in, boneless), offal (red and green), pet meat, skins, hides, semen and embryos, and other porcine products (pharmaceuticals, blood, ears, hair)
- render material sent off-site for processing
- wastes and effluent
- casings
- gut screenings and manure
- biological specimens, including for schools and universities
- in-contact wrappers and cartons
- slaughter equipment, such as knives, steels, etc.
- animals, other than pigs in contact with infected pigs and contaminated items
- pig feed, including prohibited pig feed
- other feed and bedding materials, including hay, straw, crops, grains and mixed feed
- organic fertilisers (eg pig compost).

Follow-up investigation of premises identified by tracing should be prioritised by the likelihood of transmission and the potential consequences for disease control activities.

The period of interest for tracing products from an abattoir relates to when viraemic pigs first knowingly or unknowingly arrived at the abattoir, rather than the date that ASF was first detected or diagnosed on the source farm.

Because of the risk of cross-contamination, tracing may need to include product that was in contact with suspected product at a boning room.

Tracing should include consideration of vector involvement and contact with feral pigs.

Information management systems should be used to support tracing activities, as well as examination of farm, abattoir or other facility records, and interviews with farm workers and/or managers. The PigPass database and documents such as National Vendor Declarations (NVDs) should be used to assist with tracing.

Forward tracing of product and product recall

Products and byproducts from a pig that has passed antemortem inspection, and carcase and offal that have passed postmortem inspection at an export-registered abattoir are unlikely to be the source of a further outbreak. A product recall of whole carcases would only be implemented when a risk assessment identifies that it is critical to manage the risk of transmission and the benefits would outweigh the socioeconomic costs.

The operations and effectiveness of inspection services at domestic abattoirs should be assessed to ascertain the potential for disease spread. The risk assessment includes carcase traceability.

Further information is included in the **AUSVETPLAN guidance document *Forward tracing and product recall from abattoirs affected by African swine fever*** [under development].

Surveillance

Surveillance in an ASF outbreak will initially be aimed at:

- identifying the source of infection
- determining the extent of spread, including identifying whether vector and feral pig populations are involved and, if so, their distribution
- providing data to inform risk analyses and selection of appropriate control measures.

The surveillance aims will be achieved by prioritising surveillance:

- of premises where animals are showing clinical signs consistent with ASF (SPs), and where animals are not showing clinical signs but are considered highly likely to contain an infected animal and/or contaminated animal carcasses, pig products, wastes or things (DCPs)
- of other premises found to be epidemiologically linked to the index case (identified through tracing) to determine whether they may be infected and/or contaminated
- to identify premises containing infected animals that have not been identified through tracing, for further investigation and testing.

Field surveillance should be prioritised based on risk, as indicated by the premises classification categories (SPs, TPs and DCPs are the highest priority for investigation). Further prioritisation of surveillance should be based on risk and consider the likelihood that subclinical infection may be present, and the risks of further disease transmission and dissemination. For example, SPs and TPs in areas otherwise believed to be free from infection (the OA and CA) may be a higher priority for investigation than premises in the area where infection is known to be present (the RA).

Surveillance in wild animal and vector populations is discussed in Sections 4.3.12 and 4.3.13, respectively.

Section 7 provides further guidance on surveillance for ASF, including recommendations for surveillance on premises of different classifications, and proof of freedom.

4.3.4 Zoning and compartmentalisation for international trade

Where it is not possible to establish and maintain disease freedom for the entire country, establishing and maintaining disease-free subpopulations, through zoning and/or compartmentalisation,[17] may be considered.

In the case of a limited disease outbreak, a containment zone[18] may be established around the areas where the outbreak is occurring, with the purpose of maintaining the disease-free status of the rest of the country outside the containment zone.

All zoning applications would need to be prepared by the Australian Government in conjunction with the relevant jurisdiction(s) and agreed to by the CCEAD. Compartmentalisation applications

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[17] With zoning, disease-free subpopulations are defined primarily based on geography. With compartmentalisation, disease-free subpopulations are defined primarily by management practices (such as a biosecurity plan and surveillance practices of enterprises or groups of enterprises).

[18] The OIE defines a 'containment zone' as an infected zone defined within a previously free country or zone, which includes all suspected or confirmed cases that are epidemiologically linked and where movement control, biosecurity and sanitary measures are applied to prevent the spread of, and to eradicate, the infection or infestation.

would require input from the relevant industries. Recognition of both zones and compartments must be negotiated between the Australian Government and individual overseas trading partners. Zoning and compartmentalisation would require considerable resources that could otherwise be used to control an outbreak. Careful consideration will need to be given to prioritising these activities, because the resulting competition for resources could delay the quick eradication of the disease and recognition of disease freedom.

Agreements between trading partners take time to develop, consider and finalise, because of the need to provide detailed information on activities such as biosecurity, surveillance, traceability and diagnostics to support the approach that is developed. An importing country will need assurance that its animal health status is not compromised if it imports from an established disease-free zone in Australia. Trading partners may not accept a zoning or compartmentalisation proposal, regardless of the information provided. Eradication of disease may be achieved before zoning or compartmentalisation applications are finalised.

The OIE general guidelines for zoning and compartmentalisation are in Chapter 4.4 of the OIE *Terrestrial animal health code*; guidelines for ASF are in Chapter 15.1.

4.3.5 Animal welfare

Guidance on managing livestock welfare can be found in the **AUSVETPLAN operational manual *Livestock welfare and management***.

Because morbidity and mortality resulting from ASF may be high, close monitoring and careful management of animal welfare on affected premises will be required.

The imposition of movement controls on live pigs may result in the development of animal welfare issues, particularly as a result of overcrowding. This can occur within days to weeks, depending on the production system in use (East et al 2014).

Overcrowding of pigs due to temporary cessation of movement will likely result in welfare issues unless culling is introduced as part of the emergency response. Where culling for welfare purposes is to be considered for cost sharing, see the EADRA guidance document *Livestock welfare management and compensation principles for Parties to the Emergency Animal Disease Response Agreement*.[19]

4.3.6 Vaccination

There is no commercially available vaccine against ASF.

4.3.7 Treatment of infected animals

The treatment of infected animals is not effective and will not be undertaken. Severely affected animals may be triaged and euthanased on welfare grounds.

4.3.8 Treatment of animal products and byproducts

A risk assessment should be undertaken of product and byproducts held by an abattoir/cold store at the time of the abattoir's designation as an IP or a DCPF. This should include an epidemiological assessment of the IP or the DCP supplying the pigs used in the product to

[19] https://animalhealthaustralia.com.au/ausvetplan

determine the likelihood that pigs were exposed, contaminated or infected at the time of movement to the abattoir. It should also include an assessment of the likelihood that exposed, contaminated or infected pigs may have been shipped from contaminated premises to the abattoir before detection of ASF.

If any movement of pigs from an IP or a DCP to the abattoir, including movements before confirmation of disease, is determined to present a risk of virus or disease transmission, the **AUSVETPLAN guidance document *Management of dangerous contact processing facility/infected premises abattoir and cold store on-site products during an African swine fever outbreak*** [under development] should be used to determine the product disposition and resultant action. An approach consistent with the precautionary principle should be applied. Any product movement should be commensurate with Section 6.4.4, noting that product derived from IPs and DCPs sent to an abattoir for destruction as part of the agreed response plan should be destroyed and disposed of.

Where an abattoir is designated as an IP based on confirmation of ASF in animals on antemortem inspection, and where the risk of any infected animals being processed during that line or from former shipments from the same premises is extremely low, previously processed product may be permitted to move off-site, subject to risk assessment.

Products and byproducts from pigs on SPs and TPs should be risk assessed to determine whether they need to be held and secured until the classification of the premises of origin is clarified or until the product can be tested.

Section 2.4.2 outlines the minimum level of treatment expected to inactivate ASF virus in pig products and byproducts.

Different types of rendering processes used in Australia will inactivate ASF virus. However, there is concern that low-temperature rendering, which is a wet-rendering process, will produce treated, but not rendered, product that does not meet the inactivation requirements outlined in this manual.

Rendered pig products from declared premises will not be allowed back into the pig food chain as a feed ingredient on the rare occasion that quality controls of rendered product are not met and ASF virus is not inactivated.

4.3.9 Destruction of animals

Guidance on destruction methods can be found in the **AUSVETPLAN operational manual *Destruction of animals***.

Destruction plans should be developed for each premises on which animals may be destroyed.

Because ASF is significantly less contagious than other diseases such as foot-and-mouth disease, the need for rapid destruction of pigs is reduced; however, animal welfare issues that may result from delayed destruction and overcrowding must be considered. Furthermore, reclassifying premises based on epidemiological units (see Appendix 5) should be considered, because reducing the numbers of animals for destruction will be beneficial in terms of resource requirements and financial implications (eg compensation) (see the **AUSVETPLAN guidance document *Declared areas and allocation of premises classifications in an emergency animal disease response*** [to be finalised]).

On IPs, all pigs will be destroyed.

On DCPs, based on a risk assessment (Olesen et al 2018a, Eblé et al 2019), high-risk pigs should be destroyed. These could include:

- pigs originating from an IP (within the trace-back window); representative samples will likely be collected for testing at the time of destruction
- pigs that have had direct contact with pigs on an IP
- pigs that have had access to the faeces, urine and/or secretions of pigs moved from an IP
- pigs exposed to contaminated feed or water
- pigs on which any equipment, including hypodermic needles, that has previously been used on an IP has been used (unless the equipment or needles were subject to an approved decontamination process before leaving the IP)
- pigs that have been handled by personnel immediately after they have handled pigs from an IP.[20]

The management of other pigs on DCPs should be based on the findings of the risk assessment, taking into consideration the likelihood of exposure to ASF virus and the potential risks of disease transmission (within the premises and to other premises), including the consequences for disease control.

On a case-by-case basis, destruction may be considered for low-risk pigs on DCPs where capacity is available at a DCPF and the risks of disease transmission from transportation can be adequately addressed.

On SPs and TPs, the priority will be to clarify the status of the premises as quickly as possible. Destruction of pigs on these premises is not expected but may be considered case by case, taking into consideration the likelihood that infection may be present, the consequences for disease control and the availability of resources.

Operational activities for feral pigs, including destruction, are addressed in the **AUSVETPLAN operational manual *Wild animal response strategy*** [to be updated].

Welfare destruction

Humane destruction on-site may be considered on any premises where pigs are experiencing welfare issues, such as overcrowding due to the imposition of movement controls, and where transport to processing facilities presents an unacceptable risk of disease transmission.

4.3.10 Disposal of animals, and animal products and byproducts

Guidance on disposal options and methods can be found in the **AUSVETPLAN operational manual *Disposal***.

Disposal plans should be developed for each premises where disposal is to take place (eg IP, DCP, DCPF, ADS). Disposal of potentially high-risk materials from SPs and TPs may also be required before the investigation of their status is complete.

[20] Assuming that personal decontamination has not occurred or has been insufficient to destroy ASF virus or prevent human-assisted transmission of ASF virus

High-risk materials from quarantined premises should be disposed of in a biosecure manner on-site or at an ADS. Similarly, and where practical, feral pig carcasses should be transported under permit and disposed of in a sanitary manner, which may include at an ADS.

High-risk materials include carcasses, culled pigs, pig products and byproducts, wastes, effluent, and contaminated fomites (eg clothing, equipment) that cannot be adequately decontaminated.

Feed and other items may be high-risk materials if, based on epidemiological assessment, they may be implicated in the spread of disease or may otherwise be potentially contaminated with ASF virus.

The method chosen for disposal will be influenced by the type and volume of material to be disposed of, the resources available, the local environment, the prevailing weather, legislative requirements (including environmental protection legislation) and the risk of spreading the virus.

Risk material should be disposed of in a way that prevents feral pigs and mechanical vectors (such as rodents and biting insects) from gaining access to contaminated material. Deep burial, composting, burning, incineration or above-ground burial may be considered.

Decontamination of all equipment and machinery involved in disposal will be required. Disposal must be auditable in terms of biosecurity, traceability and financial requirements.

Where disposal on-site is not feasible, an approved site for disposing of risk material (ie an ADS) may be used, subject to risk assessment and taking into consideration the risk of transmission of ASF virus during transport of the risk material to the disposal site. Movements of risk material should be in accordance with the recommended movement controls in Section 6.

Disposal of feral pigs is addressed in the **AUSVETPLAN operational manual *Wild animal response strategy*** [to be updated].

4.3.11 Decontamination

Decontamination of contaminated premises (IPs, DCPs, DCPFs and ADSs) and fomites (eg clothing, footwear, nondisposable equipment) is a critical part of the response to ASF. Decontamination plans should be developed for each premises to be decontaminated.

Decontamination of domestic piggeries requires:

- pretreatments to reduce and, preferably, eliminate, the level of organic matter (eg combinations of physical removal such as scrubbing and scraping, soaking, detergents, and high-pressure water)
- adequate contact time and concentration of the active ingredients of the disinfectant
- temperature and pH within the effective range for the disinfectant being used.

Guidance on decontamination can be found in the **AUSVETPLAN operational manual *Decontamination***.

IPs should be decontaminated following depopulation and disposal of contaminated material.

Staged decontamination may be required on DCPs where complete depopulation of the premises is not undertaken (see Section 4.3.9).

ASF virus is susceptible to a range of disinfectants (refer to Section 2.4.2 and the ***Decontamination*** manual).

Decontamination of IAs is unlikely to be practical. However, decontamination of known contaminated substrates (eg soil, feral pig carcasses) can be achieved by sanitary disposal of the substrate and chemical decontamination of fomites (eg equipment).

4.3.12 Wild animal management

Guidance on the management of wild animals in an EAD response is provided in the **AUSVETPLAN operational manual *Wild animal response strategy*** [to be updated].

ASF virus may be spread by feral pigs, other pest animals (eg rodents) and biting insects (eg flies, mosquitoes).

Feral pigs

Surveillance of feral pig populations near IPs will be required. If feral pigs are infected, measures to manage the disease in these populations may need to be considered. A surveillance and control program, including destruction, disposal and decontamination, should be developed in consultation with experts on the ecology and control of feral pigs. European experience of a staged approach to wild boar control should be considered (see Section 2.9).[21]

Where eliminating infection from the feral pig population is not feasible, compartmentalisation of the commercial pig industry may need to be pursued (see Section 4.4).

4.3.13 Vector management

Early epidemiological investigation into potential tick vector species will be important to inform vector management because it is currently unknown whether tick species in Australia will play a role in disease spread. With input from an entomologist, a vector monitoring program should be implemented to identify whether ticks are implicated in the epidemiology of ASF in Australia and, if so, the species involved.

If tick species are implicated in the spread of ASF in Australia, a targeted approach to vector control to break the transmission cycle should be developed, with entomological advice.

Rodents and other pests and vermin (eg cats, birds), and insect control measures should be implemented to minimise the risk of contamination of these vectors with ASF virus, and minimise the risk of transmission to and from neighbouring feral and domestic pig populations.

Control of the stable fly (*Stomoxys calcitrans*), which has been identified as a theoretical mechanical vector of field transmission of ASF virus (Mellor et al 1987), will be difficult to achieve.

[21] The Czech experience is reported on the OIE website (https://rr-europe.oie.int/wp-content/uploads/2019/11/5_sge-asf12_eradication-wild-boar_free-status_czech.pdf).

4.3.14 Public awareness and media

Guidance on managing public information can be found in the **AUSVETPLAN resource document *Biosecurity incident public information manual*** [to be updated].[22]

Public awareness and industry engagement will support a cohesive response. The communications strategy should include mechanisms for raising awareness in pig hunters, owners of petting zoos and school farms, urban and peri-urban pig owners, and managers of smaller commercial piggeries (who may not be engaged with the industry peak body, for example). Consumers of pork products should be targeted by food safety messaging.

Key topics to be covered in public information messaging will include advice on:

- the safety of food and other products derived from pigs
- signs of ASF in domestic and feral pigs, and how to report suspect cases
- reporting suspicion of disease
- modes of transmission of ASF virus, including spread by people, and prohibited pig feed restrictions
- biosecurity (including quarantine) and movement controls for domestic and feral pig populations, pig products and contaminated items
- biosecurity measures to minimise the presence of feral pigs, and their proximity and access to domestic pigs, thereby preventing entry of ASF virus to pig production premises
- where to find more information on the response and the control measures being used.

Further details on public information about feral pigs are provided in the **AUSVETPLAN resource document *Biosecurity incident public information manual*** [to be updated].

National coordination of public information and engagement messaging, both in the event of an ASF incident and in preparation for a potential outbreak in Australia, may occur through activation of the National Biosecurity Communication and Engagement Network.[23] The network will coordinate animal health information from jurisdictional departments of agriculture, and liaise with Australian Pork Limited and other government agencies, including public health, emergency services and environment.

4.3.15 Other strategies

Feeding of prohibited pig feed to pigs carries a high risk of introducing ASF to domestic or feral pig herds. In the event of an ASF incident and during preparation for a potential incursion of ASF into Australia, a multi-agency approach is needed to enforce current feeding bans and restrictions for domestic and feral pigs. Security at municipal waste transfer and waste facilities should be improved to prevent feral pigs gaining access to domestic food scraps. A widespread, multilingual public awareness campaign should support these controls.

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[22] BIPIM Part 1 Public Information Policy in the 'Resource documents' section of the 'Informing EAD responses – AUSVETPLAN' webpage (https://animalhealthaustralia.com.au/ausvetplan).

[23] Previously known as the Primary Industries National Communication Network (NCN). More information is available at www.outbreak.gov.au/about/biosecurity-incident-national-communication-network.

4.3.16 Stand-down

Stand-down of the response will occur when the National Management Group (NMG) formally declares that the outbreak is over. This may be when it decides (on advice from the CCEAD) that ASF has been eradicated or that eradication is no longer considered feasible, or following completion of the transition to management (T2M) phase.

Additional information on the stand-down of EAD responses can be found in the **AUSVETPLAN management manual *Control centres management (Part 1)***. Additional information on T2M can be found in the EADRA guidance document *Transition to management* [under development].

4.4 Other control and eradication options

If it is not feasible to eradicate ASF using the strategies outlined above, a T2M or long-term control program may need to be developed through consultation between Australian governments and the pig industry.

T2M may be considered an option when the implementation of an Emergency Animal Disease Response Plan (EADRP) has failed to eradicate ASF, and eradication is no longer considered technically or practically feasible, cost beneficial or desirable.

The T2M phase commences when the NMG agrees (on advice from the CCEAD) that it is no longer technically feasible, cost beneficial or desirable to eradicate ASF and that the response should enter a T2M phase.

The T2M commences when the NMG approves a revised EADRP that includes provisions for a T2M phase. The T2M ends when the activities under the revised EADRP are completed, but it must be completed within the agreed timeframe.

Should ASF virus become established in feral or domestic pig populations, the control program may include compartmentalisation of the various parts of the commercial pig industry, supported by accredited industry quality assurance and/or government accreditation programs.

4.5 Funding and compensation

Details of the cost-sharing arrangements can be found in the EAD Response Agreement.[24] Details of the approach to the valuation of, and compensation for, livestock and property in disease responses can be found in the **AUSVETPLAN operational manual *Valuation and compensation***.

[24] https://animalhealthaustralia.com.au/eadra

5 Declared areas and premises

When an emergency animal disease (EAD) is first suspected, the premises involved will undergo a clinical and/or epidemiological investigation. If the case definition, as defined in the relevant AUSVETPLAN response strategy, is met (ie the index case[25]), the relevant chief veterinary officer (CVO) or their delegate will determine the premises classification and will declare the premises an infected premises (IP).

Domestic pigs

After the identification of the first IP, an infected area (IA), a restricted area (RA) and a control area (CA) may be declared.[26] All premises within these areas will be classified.

At the beginning of an EAD incident in domestic pigs, the initial premises classifications will be IP, at-risk premises (ARP), premises of relevance (POR), unknown status premises (UP) and zero susceptible species premises (ZP).

Any premises within the RA or the CA will have only one classification at any one time. After an epidemiological investigation, clinical assessment, risk assessment or completion of control measures, a premises may be reclassified. Properties may be divided into epidemiological units that will enable multiple premises classifications within the same farming enterprise.

Once the first IP has been identified, intelligence gathering through veterinary epidemiological investigations will quickly lead to the identification of dangerous contact premises (DCPs) and trace premises (TPs). Suspect premises (SPs) may be identified through tracing and investigation, as well as by public notifications. These will have high priority for follow-up investigation by the relevant state or territory authorities. In a worst-case scenario, an SP could become an IP; therefore, SPs need to be investigated as a matter of very high priority. Similarly, investigation and risk assessment of a TP might identify it as an IP, a DCP or a dangerous contact processing facility (DCPF). An SP or a TP might also be assessed as negative and qualified as SP-assessed negative (AN) or TP-AN, and eventually reclassified as an ARP, a POR or a ZP.

All premises classifications are subject to change as a result of a modification in the case definition(s) or investigation(s) as the incident response proceeds.

Classifications should be applied with information needs of managers in mind. They should assist managers to monitor and report progress. Premises classifications to be used should be agreed early in a response, so that control centre personnel can apply the correct and consistent classifications and definitions from the outset of the investigation and response.

Feral pigs

A precautionary approach should be taken when defining declared areas where only feral pigs are infected because there is likely to be uncertainty in the distribution of African swine fever

[25] The first case to come to the attention of investigators

[26] This is invariably the case with highly contagious diseases (eg foot-and-mouth disease, equine/avian/swine influenza, classical swine fever) but may not apply to less contagious diseases (eg Hendra virus, anthrax, Australian bat lyssavirus).

(ASF) in feral pig populations. Areas should be assessed and reassessed frequently as more information is obtained on locations of infected feral pigs and likely areas of infection.

Movement controls will be applied as per domestic pig commodity matrices and the feral pig meat matrix (see Section 6).

5.1 Declared area definitions

Declared areas are areas implemented under jurisdictional legislation for the purposes of disease control management and monitoring. They include the following (or equivalent):

- IAs, which are defined when the disease is found in feral animals, and are subject to strict disease control measures
- RAs, which are subject to strict disease control measures
- CAs, which are disease-free buffers between an RA and the parts of Australia that are free from disease.

An outside area (OA) is not declared, but is the part of Australia that is disease-free.

The aim of specific movement controls and surveillance strategies that are applied within the CA is to maintain its disease-free status and prevent spread of the disease from the IA or the RA into the CA or the OA. The areas are based on risk and have clear boundaries.

The size of declared areas will vary depending on the status of the outbreak when the EAD is first detected. The size and shape of declared areas is likely to change over the duration of the outbreak. Factors that will influence the size and shape of the IA, RA and CA are included in Sections 5.1.1–5.1.3 and Appendix 6.

Detailed guidelines for declared areas are provided in the **AUSVETPLAN guidance document** ***Declared areas and allocation of premises classifications in an EAD response*** and the fact sheet ***Declared areas – what are they?*** [under development].

5.1.1 Infected area (IA)

The IA may provide an additional legislative tool in the management of feral pigs, particularly in areas where domestic pigs are not known to occur, and to demarcate the response activities between feral and domestic pig populations. The case initiating declaration of an IA must meet the case definition as described in this response strategy.

The minimum size of the IA would likely be the estimated roaming range of a feral pig. For ASF, pigs can potentially shed virus 2 days preclinically, and sick pigs are less likely to travel far. Timeframes would be estimated based on assessment of carcass decomposition.

5.1.2 Restricted area (RA)

The RA is a legally declared area that is subject to disease controls, including intense surveillance and movement controls.

For ASF, an RA (or RAs) will be declared to encompass all IPs and DCPs, and include as many SPs, TPs and DCPFs as practicable. Where feral pigs are involved, it will also encompass the IA.

For more information on determining the size of, and borders for, the RA based on risk assessment, refer to Appendix 6.

5.1.3 Control area (CA)

For ASF, the CA may initially encompass the whole of the affected state(s) or territory(ies). The size of the CA will be reassessed through the duration of the response, commensurate with the evolving situation.

The borders of the CA should be based on risk assessment, taking into consideration the factors outlined in Appendix 6.

Where only feral pigs are thought to be infected, the CA may be informed by consideration of the factors in Appendix 6 and the maximum ranging distance around the confirmed case.

5.2 Other areas

It is possible that other types of areas (eg surveillance area, or treatment area (around the IA, in the case of feral pigs)), which are not legally declared, may be used for disease control purposes in some jurisdictions.

5.2.1 Outside area (OA)

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

The OA will also be of interest for zoning[27] and compartmentalisation[28] for purposes of trade access, as well as for disease control (see below).

5.3 Premises classifications

Detailed guidelines for classifying premises statuses are provided in the **AUSVETPLAN guidance document *Declared areas and application of premises classifications in an EAD response***. Definitions of premises are in the Glossary.

5.3.1 Premises status classifications

For ASF, the premises classifications to be used are:

- infected premises (IP)
- suspect premises (SP)
- trace premises (TP)
- dangerous contact premises (DCP)
- dangerous contact processing facility (DCPF)

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[27] The process of defining, implementing and maintaining disease-free and infected areas, in accordance with OIE standards. Zoning is based on geopolitical and/or physical boundaries and surveillance, to facilitate disease control and/or trade.

[28] The process of defining, implementing and maintaining one or more disease-free establishments, under a common biosecurity management system, in accordance with OIE standards. Compartmentalisation is based on applied biosecurity measures and surveillance, to facilitate disease control and/or trade.

- approved processing facility (APF)
- approved disposal site (ADS)
- at-risk premises (ARP)
- premises of relevance (POR)
- resolved premises (RP)
- unknown status premises (UP)
- zero susceptible species premises (ZP).

For feral pigs, there is no infected premises (IP) classification. Rather, the IA represents the area thought to be contaminated with ASF virus and would most closely equate to an IP.

5.3.2 Qualifiers

Please also refer to the **AUSVETPLAN guidance document *Declared areas and premises classifications*** for more detail on qualifiers.

Assessed negative (AN)

AN is a qualifier that may be applied to IAs, ARPs, PORs, SPs, TPs, DCPs or DCPFs. The qualifier may be applied following surveillance, epidemiological investigation, and/or laboratory assessment/diagnostic testing and indicates that the premises is assessed as negative at the time of classification. SPs, TPs, DCPs or DCPFs, once assessed negative, can progress through the SP-AN, TP-AN, DCP-AN or DCPF-AN status to another status. The animals on such premises are subject to the procedures and movement restrictions appropriate to the declared area (IA, RA or CA) in which the premises is located.

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

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

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

Sentinels on site (SN)

SN is a qualifier that may be applied to IPs and DCPs to indicate that sentinel animals are present on a premises as part of response activities (ie before it can be assessed as an RP).

The qualifier should not be applied to premises that have been resolved and have been allowed to restock (regardless of the stocking density chosen for initial restocking).

5.3.3 Other disease-specific classifications

Not relevant.

5.4 Reclassifying premises and previously declared areas

Maintaining movement restrictions on areas for long periods has important implications for resource management, animal welfare, business continuity, and socioeconomic impacts on producers and regional communities. Therefore, attention should be given to reclassifying premises and previously declared areas as quickly as possible.

Detailed guidelines for reclassifying previously declared areas are provided in the **AUSVETPLAN guidance document *Declared areas and allocation of premises classifications in an emergency animal disease response***.

5.4.1 Reclassifying premises

Guidelines for assessing SPs and TPs as negative and reclassifying their status are outlined in Section 7.1.2.

IAs, IPs and DCPs require action to address the risk that infection and/or contamination with ASF virus is present. To assess an IA, IP, DCP or DCPF that houses pigs as negative – and allow its reclassification, release from biosecurity controls and, if appropriate, restocking – consideration must be given to the effectiveness of decontamination (through natural, physical and/or chemical means) in virus elimination and, where appropriate, placement of sentinel animals.

The actual time before placement of sentinel animals should consider a range of factors, including:

- factors affecting virus viability and infectivity (eg substrate protein or lipid content, ambient temperature, water content, virus virulence and quantum)
- confidence in the decontamination process through natural, physical and/or chemical means.

Guidance on the use of sentinel animals, where appropriate, before release from biosecurity controls and restocking is provided in Section 7.1.2.

5.4.2 Resolution of an abattoir from an IP or a DCPF to an RP

Given the relatively small number of Australian abattoirs processing pigs and the impact that a designation of IP or DCPF will have on the eligibility of abattoirs to receive pigs from uninfected piggeries, timely resolution of the abattoir to a resolved status (RP) is important to minimise the impact of the disease outbreak.

Criteria for resolution of an abattoir IP or DCPF are that:

- any pigs in the lairage have been destroyed and appropriately disposed of
- infected/contaminated products have been managed
- all abattoir areas (including lairage), vehicles and equipment that have had or likely had contact with infected pigs, pig products and wastes have been decontaminated and been verified as such by a government inspector
- solid and liquid wastes have been risk assessed in terms of ASF virus transmission and managed case by case.

There should be no minimum time that an abattoir must be nonoperational following completion and verification of the above activities. The detailed process and verification should determine the timeframe for resolution of an IP/DCPF abattoir.

Also refer to the **AUSVETPLAN guidance document *Resolution of an abattoir designated as an IP or DCPF in an ASF outbreak*** [under development].

6 Movement controls

6.1 Principles

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

- Containment and eradication of African swine fever (ASF) is the highest priority. Therefore, 'normal business movements' are not allowed.
- Live animals pose the greatest risk of disease spread; therefore, their movements from all premises within the infected area (IA), restricted area (RA) and control area (CA) must be strictly controlled.
- A livestock standstill is not considered necessary.
- The outside area (OA) should remain as 'clean' as possible. Therefore, movement of animals and products from the RA to the OA is generally prohibited. Movement of animals and products from the CA to the OA will also be restricted.
- Trace premises (TP) and suspect premises (SP) are temporary classifications, and every effort should be made to resolve the status of these premises as soon as possible.
- The numbers of susceptible animals within the RA should be minimised. Therefore, movements of animals into the RA will be limited and usually for slaughter only.
- Movements of stock and people are more restricted within the RA than within the CA. The size of the RA is expected to be larger in the early stages of the response.
- Movement controls may be varied during a response from those listed here. However, this will involve a variation to the agreed Emergency Animal Disease Response Plan, with endorsement by the Consultative Committee on Emergency Animal Diseases and the National Management Group.
- Recommended movement controls apply to any movement off a premises, whether on foot or by vehicle, that involve either public or private land.
- All movement control matrices are for guidance.
- Application for a movement permit does not automatically mean that one will be granted.
- In emergency or exceptional circumstances, any proposed movement may be considered by the jurisdictional chief veterinary officer (CVO) on a risk-assessed case-by-case basis.
- Interstate movements will need to meet the import requirements of the receiving jurisdiction.

6.2 Guidelines for issuing permits

In an emergency animal disease (EAD) event, with respect to pigs, quarantine and movement controls must strike a balance between quick and effective disease control, welfare and business continuity. Therefore, it is not appropriate to simply prohibit all movement of animals and products. On the other hand, diligence needs to be applied to minimise the risk of further spread of the disease.

Recommended biosecurity and movement controls in each AUSVETPLAN response strategy provide guidance on which movements can be allowed and under what conditions. This is based on an analysis of the disease risks that are presented by a specific movement, of a specific

commodity, at a specific time during the EAD response phase. Each disease strategy will indicate whether a proposed movement is:

- allowed (under normal jurisdictional, including interstate, requirements)
- prohibited – except under the conditions of a general, special or emergency permit
- prohibited.

Permits may not be available until the relevant CVO provides approval for movements, and this may not be available in the early stages of a response. When assessing risk for the purposes of issuing a permit, the elements to consider may include:

- sources of risk
  - risk material such as pigs (live or dead), semen, embryos, meat, meat products, waste products (offal, gut contents, manure, render material, fertiliser, biological specimens, casings, used wrappers and cartons, effluent) and fomites (vehicles; people; nonsusceptible animals; crops, grains, hay silage and mixed feeds)
  - premises classification of both the originating and destination premises
  - presence of ASF virus on both the originating and destination premises
  - location of source and destination premises
  - fate at destination premises (eg for slaughter vs for growing out)
  - current vector activity, if relevant
  - presence of feral pigs in the area
  - organisation and management issues (ie confidence in animal tracing and surveillance)
  - proposed end use of pig products, byproducts and waste
  - proposed transport route
  - treatment of animals and vehicles to prevent concurrent movement of vectors, if relevant
  - security of transport
  - security and monitoring at the destination
  - environment and natural events
  - community and human behaviour
  - risk of sabotage
  - technology
  - regulations and standards
  - available resources for compliance and enforcement
- areas of impact
  - livestock health (health of affected species, including animal welfare)
  - human health (including worker health and safety, and mental health)
  - trade and economic impacts (including commercial and legal impacts)
  - environmental impacts
  - organisational capacity
  - political impacts
  - reputation and image of the producer, government and wider industry
- proposed risk treatment measures
  - destruction of animals
  - processing of product
  - decontamination or other treatment of animals, vehicles and fomites
  - vector control, if relevant
  - biosecurity and movement records
  - security and compliance enforcement
  - communication.

6.3 Types of permits

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

6.3.1 General permit

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

6.3.2 Special permit

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

Emergency permit

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

6.3.3 Other movement requests

Movements not reflected within any of the movement control matrices or narratives may be considered by the relevant jurisdictional CVO on a risk-assessed case-by-case basis.

6.4 Recommended quarantine practices and movement controls

Movement controls and quarantine will be imposed as quickly as possible on all premises and areas in which ASF virus is either known or suspected. Movement controls will apply to anything that may have become contaminated with ASF virus.

Movement controls both onto and off the IA (in the case of feral pigs) and classified premises will apply to all animals, people, products and fomites within declared areas.

Since ASF virus is not transmitted from farm to farm by wind, preventing the movement of suspect animals, people and materials will likely contain the disease. However, insects and ticks may play a role, and the role of feral pigs in the outbreak must be considered and managed.

It may be several weeks before there can be any confidence that no feral or domestic pigs in an area are incubating the disease, and biosecurity controls will be maintained during this time.

Pigs and products such as manure, compost and contaminated feed that cannot be moved from infected premises (IPs) will need to be destroyed and disposed of or treated in a biosecure manner.

Technical and other disease risks for assessment in deciding movement controls are provided in Appendix 7.

6.4.1 Recommended movement controls for live pigs

Table 6.1 describes the recommended movement controls for live pigs within and between declared areas.

Table 6.1 Recommended movement controls for live pigs within and between declared areas

To→ From ↓		RA						CA				OA
		IP	DCP	SP, TP	DCPF	APF	ARP	SP, TP	DCPF	APF	POR	
RA	IP	Prohibited (except under EP – conditions a, c, d, e, h, l)	Prohibited	Prohibited	Prohibited (except under EP – conditions a, c, d, e, h, l)	Prohibited	Prohibited	Prohibited	Prohibited (except under EP – conditions a, b, c, d, e, h, k, l n)	Prohibited	Prohibited	Prohibited
	DCP	Prohibited (except under EP – conditions a, c, d, e, h, k, l)	Prohibited	Prohibited	Prohibited (except under EP – conditions a, c, d, e, h, k, l)	Prohibited	Prohibited	Prohibited	Prohibited (except under EP – conditions a, b, c, d, e, h, k, l n)	Prohibited	Prohibited	Prohibited
	SP	Prohibited (except under EP – conditions a, c, d, e, h, k, l)	Prohibited	Prohibited	Prohibited (except under EP – conditions a, c, d, e, h, k, l)	Prohibited	Prohibited	Prohibited	Prohibited (except under EP – conditions a, c, d, e, h, k, l, n)	Prohibited	Prohibited	Prohibited
	TP	Prohibited (except under EP – conditions a, c, d, e, h, k, l),	Prohibited	Prohibited	Prohibited (except under EP – conditions a, c, d, e, h, k, l)	Prohibited	Prohibited	Prohibited	Prohibited (except under EP – conditions a, c, d, e, h, k, l, n)	Prohibited	Prohibited	Prohibited
	ARP	Prohibited (except under SpP – conditions a, c, d, f, h, j, k, l)	Prohibited	Prohibited	Prohibited (except under GP – conditions a2, c, f, h, j, k, l)	Prohibited (except under GP – conditions a2, c, f, g, i, j, k, l, n)	Prohibited (except under SpP – conditions c, d, f, g, i, j, k, l, m)	Prohibited	Prohibited (except under SpP – conditions a2, c, d, f, g, h, j, l, n)	Prohibited (except under SpP – conditions a2, c, d, f, g, i, j, k, l, n)	Prohibited (except under SpP – conditions c, d, f, g, i, j, k, l, m)	Prohibited (except under SpP – conditions a2, c, f, g, i, j, k, l, n, o)
CA	SP	Prohibited (except under EP – conditions a, c, d, e, h, k, l, n)	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, c, d, e, h, k, l, n)	Prohibited	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, c, d, e, h, k, l)	Prohibited	Prohibited	Prohibited
	TP	Prohibited (except under EP – conditions	Prohibited	Prohibited	Prohibited (except under SpP –	Prohibited	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, c, d, f, h, j, l)	Prohibited	Prohibited	Prohibited

To→ From ↓		RA						CA				OA
		IP	DCP	SP, TP	DCPF	APF	ARP	SP, TP	DCPF	APF	POR	
		a, c, d, e, h, j, k, l, n)			conditions a, c, d, e, h, j, k, l, n)							
	POR	Prohibited	Prohibited	Prohibited	Prohibited (except under GP – conditions a2, c, f, h, j, k, l, n)	Prohibited (except under GP – conditions a2, c, f, g, i, j, k, l, n)	Prohibited (except under SpP – conditions c, d, f, g, i, j, k, l, m)	Prohibited	Prohibited (except under GP – conditions a2, c, f, h, j, l)	Prohibited (except under GP – conditions a2, c, f, g, i, j, k, l)	Prohibited (except under GP – conditions c, f, g, i, j, k, l, m)	Prohibited (except under SpP – conditions a2, c, f, g, i, j, k, l, n, o)
OA		Prohibited	Prohibited	Prohibited	Prohibited	Prohibited (except under GP – conditions a2, c, f, g, i, j, k, l, n)	Prohibited (except under SpP – conditions c, d, f, g, i, j, k, l, m)	Prohibited	Prohibited (except under SpP – conditions a, c, d, f, h, j, k, l, n)	Prohibited (except under GP – conditions a2, c, f, g, i, j, k, l, n)	Prohibited (except under GP – conditions c, f, g, i, j, k, l, m)	Allowed under normal jurisdictional and interstate movement requirements

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

Permit conditions for Table 6.1:

a) Direct movement to abattoir for destruction and disposal or IP for destruction and disposal.

a2) Direct movement to abattoir for slaughter only (for human consumption, subject to risk assessment).

b) Only under exceptional circumstances. Only if on-farm destruction cannot be undertaken and no alternative means of destruction are available in the RA.

c) Single consignment per load.

d) Under approval from CVO (for emergency permits) or CVO delegate/inspector of livestock (for SpP) after assessment[29] indicates that the risk associated with the movement is acceptable within the response.

e) Travel by approved routes and no stopping en route.

f) Travel by main roads/highways and not transiting through a property or stopping en route adjacent to a known pig production area.

g) [The dispatching and receiving premises must meet minimum biosecurity standards.[30]]

h) Vehicles carrying livestock are decontaminated (ie cleaned and disinfected) after unloading and inspected/certified as such. Decontamination must occur before entry to a new pig premises or pig product processing facility within the destination declared area or before leaving the destination declared area.

i) Vehicles carrying livestock are decontaminated (ie cleaned and disinfected) after unloading. Decontamination must occur before entry to a new pig premises or pig product processing facility within the destination declared area or before leaving the destination declared area.

j) Absence of clinical signs consistent with ASF in all pigs on the premises of origin before and on the day of dispatch.

k) Any suspicious or clinically consistent clinical signs of ASF in pigs proposed to be moved are immediately reported to the local control centre, the state coordination centre or the Emergency Animal Disease Watch Hotline (1800 675 888).

l) All pig movements must comply with state/territory legislation related to traceability requirements/standards, and be accompanied by a PigPass National Vendor Declaration (NVD) or waybill. Traceability must be maintained for a minimum of 30 days for consignments moved to another farm.

m) Pigs are kept separate ('quarantined') on the receiving farm as a separate biosecurity unit for a minimum of 15 days before introduction to the herd, or pigs at the origin (dispatching farm) and destination (receiving farm) are in the same domestic enterprise compartment with the same biosecurity status. Biosecurity controls are applied to personnel, equipment (fomites) and feed to eliminate contact between different biosecurity units [as per the minimum biosecurity standards], together with specific biosecurity enhancements agreed by the CVO.[30]

n) For slaughter only, if the declared area of origin does not contain an available abattoir.

o) Under approval from CVO (for emergency permits) or CVO delegate/inspector of livestock (for SpP) after assessment[31] indicates that the risk associated with the movement is acceptable within the response. The premises must have the assessed

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[29] This may include diagnostic testing of pigs scheduled for movement, or background surveillance testing of 'normal', sick and dead pigs to exclude ASF.

[30] ['Minimum biosecurity standards' – Australian Pork Industry Quality Assurance Program (APIQ) accreditation or equivalent to the APIQ biosecurity standards and the *National farm biosecurity manual for pork production* (November 2019)]

[31] This may include diagnostic testing of pigs scheduled for movement, or background surveillance testing of 'normal' sick and dead pigs to exclude ASF – refer to Appendix 8 for more information.

negative (AN) qualifier, which may involve clinical surveillance and/or diagnostic testing to demonstrate absence of ASF. Pigs scheduled for movement may also be required to be tested.

6.4.2 Recommended movement controls for pig semen

Movement of semen from high-risk premises will be prohibited. To enable business continuity, semen sourced from properties in the CA and OA can be moved into the RA and CA under permit. However, since pigs on IPs and some dangerous contact premises (DCPs) will be destroyed, movement of semen onto IPs or DCPs (as well as onto SPs and TPs) is prohibited.

Almost all movements are of fresh semen. Frozen semen is rarely used and will be handled case by case.

Table 6.2 describes the recommended movement controls for pig semen within and between declared areas.

Table 6.2 Recommended movement controls for pig semen within and between declared areas

To→ From ↓		RA				CA		OA
		IP	DCP	SP, TP	ARP	SP, TP	POR	
RA	IP, DCP, SP, TP	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
	ARP	Prohibited	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)
CA	SP, TP	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
	POR	Prohibited	Prohibited (except under GP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under GP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under GP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under GP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under GP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)

OA	Prohibited	Prohibited (except under GP – conditions b, c, d, e, f, g, h)	Prohibited (except under GP – conditions b, c, d, e, f, g, h)	Prohibited (except under GP – conditions b, c, d, e, f, g, h)	Prohibited (except under GP – conditions b, c, d, e, f, g, h)	Prohibited (except under GP – conditions b, c, d, e, f, g, h)	Allowed in accordance with jurisdictional movement requirements

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

Permit conditions for Table 6.2:

a) For the dispatch of semen from an at-risk premises (ARP) or a premises of relevance (POR) (ie a boar stud within the RA or the CA, respectively), a government veterinary officer or an appropriately skilled independent registered veterinarian approved by the CVO is to undertake a risk assessment of site infection risks on the semen collection premises (boar stud) and conclude that the risks are acceptable before an inspector may issue a permit for the movement of semen. The risk assessment will include whether the boar stud can meet the permit conditions listed below [and demonstrate maintenance of minimum biosecurity standards.[32]]
b) Donor boars are present for at least 30 days (two incubation periods) on the premises before semen is collected for dispatch.
c) A daily health monitoring program is in place to observe all pigs on the premises and to detect and investigate clinical signs of ASF in pigs on the farm.
d) Any high suspicion of ASF is immediately reported to the Emergency Animal Disease Watch Hotline (1800 675 888).
e) Laboratory testing of highly suspicious sick or dead pigs at the boar collection facility is undertaken to exclude ASF. (If highly suspicious clinical signs are observed, unused collected semen and semen already dispatched should not be used, and further dispatch of semen must not occur until absence of ASF is confirmed.)
f) Farm records of all disease investigations and diagnoses are maintained.
g) Records of all semen dispatches are maintained to enable traceability of semen dispatches to individual farms.
h) Semen dispatching procedures ensure that couriers/transporters do not enter the pig production area.

[32] [Australian Pork Industry Quality Assurance Program (APIQ) accreditation or equivalent to the APIQ biosecurity standards and the *National farm biosecurity manual for pork production* (November 2019)]

6.4.3 Recommended movement controls for pig embryos

The International Embryo Transfer Society has indicated that there is not enough information to reach a conclusion about the risk of transmission of ASF virus via embryos.

Movements of pig embryos are expected to be infrequent (mainly for research purposes) and low risk; however, a precautionary approach is taken.

Table 6.3 describes the recommended movement controls for pig embryos within and between declared areas.

Table 6.3 Recommended movement controls for pig embryos within and between declared areas

To→ From ↓		RA				CA		OA
		IP	DCP	SP, TP	ARP	SP, TP	POR	
RA	IP, DCP, SP, TP	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
	ARP	Prohibited	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)
CA	SP, TP	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
	POR	Prohibited	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)
OA		Prohibited	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under GP – conditions b, c, d, e, f, g, h)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under GP – conditions b, c, d, e, f, g, h)	Allowed in accordance with jurisdictional movement requirements

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

Permit conditions for Table 6.3:

a) For the dispatch of embryos from an ARP or a POR (ie an embryo collection centre), a government veterinary officer or an appropriately skilled independent registered veterinarian approved by the CVO is to undertake a risk assessment of site infection risks on the embryo collection premises and conclude that the risks are acceptable before an inspector may issue a permit for the movement of embryos. The risk assessment will include whether the embryo collection premises can meet the permit conditions listed below [and demonstrate maintenance of minimum biosecurity standards.[33]]
b) Donor sows/gilts are present for at least 30 days (two incubation periods) on the premises before embryos are collected for dispatch.
c) A daily health monitoring program is in place to observe all pigs on the premises and to detect and investigate clinical signs of ASF in pigs on the farm.
d) Any high suspicion of ASF is immediately reported to the Emergency Animal Disease Watch Hotline (1800 675 888).
e) Laboratory testing of highly suspicious sick or dead pigs at the embryo collection facility is undertaken to exclude ASF. (If highly suspicious clinical signs are observed, unused collected embryos and embryos already dispatched should not be used, and further dispatch of embryos must not occur until absence of ASF is confirmed).
f) Farm records of all disease investigations and diagnoses are maintained.
g) Records of all embryo dispatches are maintained to enable traceability of embryo dispatches to individual farms.
h) Embryo dispatching procedures ensure that couriers/transporters do not enter the pig production area.

[33] [Australian Pork Industry Quality Assurance Program (APIQ) accreditation or equivalent to the APIQ biosecurity standards and the *National farm biosecurity manual for pork production* (November 2019)]

6.4.4 Recommended movement controls for meat and meat products of domestic animals from abattoirs and chillers

Meat and meat products may include whole carcases, meat, raw offal, blood, bone, sausage casings, skin, fat, pig ears, snouts, trotters, and items such as heart valves destined for therapeutic use in humans or animals, from animals and carcases that have passed antemortem and postmortem inspection. Where the abattoir processes multiple species, it will include all meat and meat products from all species.

Meat and meat products exclude any carcase or item that has not been passed as fit for human consumption, or that has been consigned for rendering or discarded as a waste product during processing (eg hair, bone or trimmings). The matrix in this section does not cover movements of wild harvested meat or meat products.

Permit applications for movements of meat or meat products must consider the premises classification of the property of origin of the pigs, the likelihood that the consignment was infected at the time of processing, whether product is contaminated with viable ASF virus, whether the product is traceable to its property of origin, the destination or intended use of the product (including the potential for exposure of pigs) and biosecurity during transport. Note: Once product is released into the market, there are unlikely to be further restrictions on movement within or between declared areas.

Assessment of likelihood of ASF virus contamination of meat and meat products

Where abattoirs process both pigs and other species, the likelihood of ASF virus contamination of meat and meat products from other species will also need to be assessed.

The following steps will be used to determine the likelihood that pigs were infected at the time of processing and/or product is contaminated with ASF virus:

1. When an abattoir or cold store is designated as an IP, SP, dangerous contact processing facility (DCPF) or TP due to detection of ASF, suspicion of disease or tracing, undertake an epidemiological assessment to determine the likelihood that the pigs of interest were viraemic when they were slaughtered. As part of this investigation, any animal, carcase or line of carcases that shows clinical signs consistent with ASF should be tested to confirm or exclude ASF. The consignment will be classified as high, medium or low likelihood of being viraemic when slaughtered.
   Note: If test results are pending, it is possible that relevant product will be assumed to be at high risk of contamination if it is impractical to hold product until test results are available.
2. Determine whether the product that is likely to be contaminated can be identified and traced among other product on-site or in the chiller. All product that cannot be traced to a specific line of pigs will be designated as the same risk as product from the pigs of interest in 1. above.
3. Determine whether product from other consignments of animals may have been contaminated during processing. All product that may have been contaminated will be designated as the same risk as product from the pigs of interest in 1. above.

Note: Product classified as low risk must originate from pigs and carcases that:

- are from an epidemiological unit/premises classification and cohort that is assessed by veterinary investigations as unlikely to be infected or contaminated, and
- pass antemortem and postmortem inspection by a government veterinarian or CVO-approved inspector.

Also refer to the **AUSVETPLAN guidance document *Management of dangerous contact processing facility/infected premises abattoir and cold store on-site product during an African swine fever outbreak*** [under development].

Table 6.4 describes the recommended movement controls for meat and meat products of domestic animals from abattoirs and chillers within and between declared areas.

Table 6.4 Recommended movement controls for meat and meat products of domestic animals from abattoirs and chillers within and between declared areas

To→ From ↓		**Likelihood that product is contaminated[a]**	**RA**	**CA**	**OA**
RA	**IP**	High	Prohibited. Destroyed on-site or moved for disposal under SpP – conditions a, b, c, d, e, f	Prohibited. Destroyed on-site or moved for disposal under SpP – conditions a, b, c, d, e, f	Prohibited
		Medium	Prohibited. Destroyed on-site or moved for disposal under SpP – conditions a, b, c, d, e, f	Prohibited. Destroyed on-site or moved for disposal under SpP – conditions a, b, c, d, e, f	Prohibited
		Low	Prohibited (except under SpP – conditions a, d, e, f)	Prohibited (except under SpP – conditions a, d, e, f)	Prohibited (except under SpP – conditions a, d, e, f)
	DCPF	High	Prohibited. Destroyed on-site or moved for disposal under SpP – conditions a, b, c, d, e, f	Prohibited. Destroyed on-site or moved for disposal under SpP – conditions a, b, c, d, e, f	Prohibited
		Medium	Prohibited. Destroyed on-site or moved for disposal under SpP – conditions a, b, c, d, e, f	Prohibited. Destroyed on-site or moved for disposal under SpP – conditions a, b, c, d, e, f	Prohibited
		Low	Prohibited (except under SpP conditions – a, d, e, f)	Prohibited (except under SpP – conditions a, d, e, f)	Prohibited (except under SpP – conditions a, d, e, f)
	SP, TP	High	Prohibited. Destroyed on-site or moved for disposal under SpP – conditions a, b, c, d, e, f	Prohibited. Destroyed on-site or moved for disposal under SpP – conditions a, b, c, d, e, f	Prohibited
		Medium	Prohibited. Destroyed on-site or moved for disposal under SpP – conditions a, b, c, d, e, f	Prohibited. Destroyed on-site or moved for disposal under SpP – conditions a, b, c, d, e, f	Prohibited
		Low	Prohibited (except under SpP – conditions a, d, e, f)	Prohibited (except under SpP – conditions a, d, e, f)	Prohibited (except under SpP – conditions a, d, e, f)

To→ From ↓		Likelihood that product is contaminated[a]	RA	CA	OA
	APF	Low	Allowed under GP – conditions d, e, f	Allowed under GP – conditions d, e, f	Allowed under GP – conditions d, e, f
	Unclassified abattoir or cold store plant	Low	Prohibited (except under SpP – conditions a, d, e, f)	Prohibited (except under SpP – conditions a, d, e, f)	Prohibited (except under SpP – conditions a, d, e, f)
CA	**DCPF**	High	Prohibited. Destroyed on-site or moved for disposal under SpP – conditions a, b, c, d, e, f	Prohibited. Destroyed on-site or moved for disposal under SpP – conditions a, b, c, d, e, f	Prohibited
		Medium	Prohibited. Destroyed on-site or moved for disposal under SpP – conditions a, b, c, d, e, f	Prohibited. Destroyed on-site or moved for disposal under SpP – conditions a, b, c, d, e, f	Prohibited
		Low	Prohibited (except under SpP – conditions a, d, e, f)	Prohibited (except under SpP – conditions a, d, e, f)	Prohibited (except under SpP – conditions a, d, e, f)
	SP, TP	High	Prohibited. Destroyed on-site or moved for disposal under SpP – conditions a, b, c, d, e, f	Prohibited. Destroyed on-site or moved for disposal under SpP – conditions a, b, c, d, e, f	Prohibited
		Medium	Prohibited. Destroyed on-site or moved for disposal under SpP – conditions a, b, c, d, e, f	Prohibited. Destroyed on-site or moved for disposal under SpP – conditions a, b, c, d, e, f	Prohibited
		Low	Prohibited (except under SpP – conditions a, d, e, f)	Prohibited (except under SpP – conditions a, d, e, f)	Prohibited (except under SpP – conditions a, d, e, f)
	APF	Low	Allowed under GP – conditions d, e, f	Allowed under GP – conditions d, e, f	Allowed under GP – conditions d, e, f
	Unclassified abattoir or cold store plant	Low	Prohibited (except under SpP – conditions a, d, e, f)	Prohibited (except under SpP – conditions a, d, e, f)	Prohibited (except under SpP – conditions a, d, e, f)
OA	**Abattoir or cold chiller**	Very low	Allowed under normal jurisdictional or interstate movement requirements	Allowed under normal jurisdictional or interstate movement requirements	Allowed under normal jurisdictional or interstate movement requirements

APF = approved processing facility; CA = control area; DCPF = dangerous contact processing facility; GP = general permit; IP = infected premises; OA = outside area; RA = restricted area; SP = suspect premises; SpP = special permit; TP = trace premises

a Based on steps 1–3 described in the text.

Permit conditions for Table 6.4:

a) Documented risk assessment that indicates that the risk associated with the movement is acceptable within the response.
b) For disposal or treatment (eg burial, composting, incineration, landfill, rendering).
c) Biosecure transport by approved routes only to an approved disposal or treatment facility.
d) The material is not brought into direct or indirect contact with susceptible animals.
e) Every precaution is taken to ensure that effluent, other fluids or materials do not leak or fall out of the transport vehicle.
f) Transport vehicles and containers are cleaned and disinfected after unloading. Drivers must shower, change and avoid contact with pigs for at least 24 hours after delivery.

6.4.5 Recommended movement controls for feral pig meat and meat products

Feral pig meat and meat products may include whole carcases, meat, raw offal, blood, bone, sausage casings, skin, fat, pig ears, snouts, trotters, trophies and skins.

Meat excludes any carcase or item that has not been passed for human consumption, or that has been consigned for rendering or discarded as a waste product during dressing or processing (eg hair, bone or trimmings).

Permit applications for movements of feral pig meat or meat products must consider the likelihood that the product is contaminated with viable ASF virus, the destination or intended use of the product (including the potential for exposure of pigs), and biosecurity during transport. Note: Once product is released into the market, there are unlikely to be further restrictions on movement within or between declared areas.

Table 6.5 describes the recommended movement controls for feral pig meat (including whole carcases) within and between declared areas.

Table 6.5 Recommended movement controls for feral pig meat (including whole carcases) within and between declared areas

To→		**IA**	**RA**	**CA**		**OA**	
From ↓		**All premises and locations**	**All premises**	**APF**	**All other premises**	**APF**	**All other premises**
IA	**All premises and locations**	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
RA	**All premises**	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
CA	**All premises**	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
OA	**Carcases from all premises/locations other than APFs**	Prohibited (except under SpP – conditions a, b, c, d, e, f)	Prohibited (except under SpP – conditions a, b, c, d, e, f)	Prohibited (except under SpP – conditions a, b, c, d, e, f)	Prohibited	Prohibited (except under SpP – conditions a, c, d, e, f)	Prohibited
	APF	Prohibited	Prohibited	Prohibited (except under SpP –	Prohibited	Prohibited (except under SpP –	Allowed under jurisdictional and

				conditions a, b, c, d, e, f)		conditions a, c, d, e, f)	interstate movement requirements under GP – conditions c, d, e, f, g

APF = approved processing facility; CA = control area; GP = general permit; IA = infected area; OA = outside area; RA = restricted area; SpP = special permit

Permit conditions for Table 6.5:

a) Documented risk assessment that indicates that the risk associated with the movement is acceptable within the response.
b) For disposal or treatment (eg burial, composting, incineration, landfill, rendering).
c) Biosecure transport by approved routes only.
d) The material is not brought into direct or indirect contact with susceptible animals.
e) Every precaution is taken to ensure that effluent, other fluids or materials do not leak or fall out of the transport vehicle.
f) Transport vehicles and containers are cleaned and disinfected after unloading. Drivers must shower, change and avoid contact with pigs for 24 hours after delivery.
g) For personal consumption only.

6.4.6 Recommended movement controls for domestic pig carcasses, stillborn piglets and placentas for disposal off farm

Note: The movement of feral pig carcasses is prohibited within, between and from the RA and the CA except under SpP.

Table 6.6 describes the recommended movement controls for domestic pig carcasses, stillborn piglets and placentas within and between declared areas.

Table 6.6 Recommended movement controls for domestic pig carcasses, stillborn piglets and placentas within and between declared areas

To→ From ↓		**RA**	**CA**	**OA**
RA	**IP, DCP, SP, TP**	Prohibited (except under EP – conditions a, b, c, e, f) Disposal options B, C, I, L, R	Prohibited (except under EP – conditions a, b, c, e, f) Disposal options B, C, I, L, R	Prohibited
	ARP	Prohibited (except under SpP – conditions a, b, d, e, g, h, i) Disposal options B, C, I, L, R	Prohibited (except for rendering[a] under SpP – conditions a, b, d, e, g, h, i, j, k) Disposal options B, C, I, L, R	Prohibited
CA	**SP, TP**	Prohibited (except under EP – conditions a, b, c, e, f) Disposal options B, C, I, L, R	Prohibited (except under EP – conditions a, b, c, e, f) Disposal options B, C, I, L, R	Prohibited
	POR	Prohibited (except for rendering[a] under SpP – conditions a, b, d, e, g, h, i, j) Disposal options B, C, I, L, R	Prohibited (except under GP – conditions a, d, e, g, h, i) Disposal options B, C, I, L, R	Prohibited (except for rendering under GP – conditions a, d, e, g, h, i, j)
OA		Prohibited	Prohibited (except for rendering[a] under GP – conditions a, d, g, h, i, j)	Allowed under normal jurisdictional requirements

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

Disposal options: B – burial (on farm, off farm (communal)); C – composting (on farm, off farm, commercial; if not on the farm of origin, only permitted on a zero susceptible species premises (ZP)); I – incineration (pyre or air curtain incineration); L – landfill (commercial/licensed); R – rendering

a BCILR (burial, composting, incineration, landfill, rendering) disposal options should be available within the CA, whereas rendering facilities may not be.

Permit conditions for Table 6.6:

a) Direct movement from premises of origin to disposal site.
b) Under approval from CVO (for emergency permits) or CVO delegate/inspector of livestock (for SpP) after assessment indicates that the risk associated with the movement is acceptable within the response. This may include laboratory testing of sick and dead pigs to exclude ASF.
c) Travel by approved routes and no stopping en route.
d) Travel by main roads/highways and not transiting through a property or stopping en route adjacent to a known pig production area.
e) Carcasses, stillborn piglets and placentas must be transported in leakproof trucks, vehicle trays or containers.
f) Vehicles carrying carcasses, stillborn piglets and placentas are decontaminated (ie cleaned and disinfected) after unloading and inspected/certified as such.
g) Vehicles carrying carcasses, stillborn piglets and placentas are decontaminated (ie cleaned and disinfected) after unloading.
h) Absence of clinical signs consistent with ASF in all pigs on the premises before and on the day of dispatch.
i) Any clinical signs in pigs suspicious for, or consistent with, ASF are immediately reported to the local control centre, state coordination centre or Emergency Animal Disease Watch Hotline (1800 675 888).
j) For rendering only, if the area of origin does not contain an accessible rendering facility.

6.4.7 Recommended movement controls for waste products and effluent off farm

Waste products are defined as manure, effluent, bedding and composted material (which may include composted carcasses).

Table 6.7 describes the recommended movement controls for waste products and effluent off farm within and between declared areas.

Table 6.7 Recommended movement controls for waste products and effluent off farm within and between declared areas

To→ / From ↓		RA							CA					OA
		ADS[a] (which must also be a ZP)	Commercial compost facility	IP	DCP	SP, TP	ARP	ZP	ADS (which must also be a ZP)	Commercial compost facility	SP, TP	POR	ZP	
RA	IP	Prohibited (except under SpP – conditions a, b, c, d, e, f, g)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under EP – conditions a, b, c, d, e, f, g)	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h, i)	Prohibited	Prohibited	Prohibited	Prohibited
	DCP	Prohibited (except under SpP – conditions a, b, c, d, e, f, g)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g)	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, i)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h, i)	Prohibited	Prohibited	Prohibited	Prohibited
	SP	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
	TP	Prohibited (except under SpP – conditions a, b, c, d, e, f, g)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, i)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h, i)	Prohibited	Prohibited	Prohibited	Prohibited
	ARP	Prohibited (except under SpP –	Prohibited (except under SpP –	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited (except under SpP	Prohibited (except under SpP –	Prohibited (except under SpP –	Prohibited	Prohibited	Prohibited (except under SpP –	Prohibited

To→ From ↓		RA							CA					OA
		ADS[a] (which must also be a ZP)	**Commercial compost facility**	**IP**	**DCP**	**SP, TP**	**ARP**	**ZP**	**ADS (which must also be a ZP)**	**Commercial compost facility**	**SP, TP**	**POR**	**ZP**	
		conditions a, b, c, d, e, f, g)	conditions a, b, c, d, e, f, g, h)					– conditions a, b, c, d, e, f, g)	conditions a, b, c, d, e, f, g, i)	conditions a, b, c, d, e, f, g, h, i)			– conditions a, b, c, d, e, f, g)	
CA	**SP**	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
	TP	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, i)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h, i)	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, i)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h, i)	Prohibited	Prohibited	Prohibited	Prohibited
	POR	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, i)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h, i)	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, b, c, d, e, f, g)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, b, c, d, e, f, g)	Prohibited
OA		Prohibited (except under SpP – conditions a, b, c, d, e, f, g, i)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h, i)	Prohibited	Prohibited	Prohibited	Prohibited	Allowed under normal jurisdictional requirements	Allowed under normal jurisdictional requirements	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h, i)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h, i)	Prohibited	Allowed under normal jurisdictional requirements	Allowed under normal jurisdictional requirements

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

a Disposal facility refers to the site where product is ultimately disposed of. It does not refer to facilities where treatment is applied before product is transported to a subsequent destination.

Permit conditions for Table 6.7:

a) Will involve a risk assessment to determine whether the risk associated with the movement is acceptable within the response, including any conditions required to manage the product at the receiving premises.
b) Biosecurity practices, including decontamination, must be implemented for vehicles and equipment when entering and exiting properties known or likely to be contaminated, to minimise the risk of disease spread.
c) Transport must be undertaken in a biosecure manner and in leakproof trucks, vehicle trays or containers.
d) Transport by main roads/highways and not transiting through a property or stopping en route adjacent to a known pig production area.
e) Transport vehicles are decontaminated (ie cleaned and disinfected) at an appropriate site (eg truck wash-down facility) immediately after unloading and under supervision (government, industry or accredited third party). Decontamination must occur before entry to a new pig premises or pig product processing facility within the destination declared area or before leaving the destination declared area.
f) Any material permitted for movement must not be brought into direct or indirect contact with susceptible livestock.
g) The receiving premises must implement biosecurity standards that minimise the risk of contaminated product contributing to viral spread, and must have mechanisms that minimise the likelihood of wild/feral animals accessing the waste product material.
h) Material must be treated in a manner that meets requirements for inactivation of ASF virus before further movement of material to another destination.
i) Movement only considered where there is no disposal facility in the same declared area.

6.4.8 Recommended movement controls for waste products and effluent from abattoirs and processing facilities

Waste products are defined as manure, effluent, skins, hair, blood, rendered product and offal (products that have not been inspected or have not been declared fit for human consumption).

Table 6.8 describes the recommended movement controls for waste products and effluent from abattoirs and processing facilities within and between areas.

Table 6.8 Recommended movement controls for waste products and effluent from abattoirs and processing facilities within and between declared areas

To→ / From ↓		RA							CA					OA
		ADS[a] (which must also be a ZP)	DCPF[b]	APF[c]	IP, DCP	SP, TP	ARP	ZP[c]	ADS (which must also be a ZP)	DCPF[c]	APF[c]	SP, TP, POR	ZP[c]	
RA	IP	Prohibited (except under SpP – conditions a, b, c, d, e, f, g)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, i)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, i)	Prohibited	Prohibited	Prohibited	Prohibited
	DCPF	Prohibited (except under SpP – conditions a, b, c, d, e, f, g)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, i)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, i)	Prohibited	Prohibited	Prohibited	Prohibited
	SP	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
	TP	Prohibited (except under SpP – conditions a, b, c, d, e, f, g)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited (except under SpP – conditions	Prohibited (except under SpP – conditions a,	Prohibited	Prohibited	Prohibited	Prohibited

To→ From ↓		RA							CA					OA
		ADS[a] (which must also be a ZP)	DCPF[b]	APF[c]	IP, DCP	SP, TP	ARP	ZP[c]	ADS (which must also be a ZP)	DCPF[c]	APF[c]	SP, TP, POR	ZP[c]	
									a, b, c, d, e, f, g, i)	b, c, d, e, f, g, i)				
	APF	Prohibited (except under SpP – conditions a, b, c, d, e, f, g)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, b, c, d, e, f, g)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, i)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited	Prohibited (except under SpP – conditions a, b, c, d, e, f, g)	Prohibited
CA	SP	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
	TP	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, i)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h, i)	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, b, c, d, e, f, g)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h)	Prohibited	Prohibited	Prohibited	Prohibited
	APF	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, i)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h, i)	Prohibited (except under SpP – conditions a, b, c, d, e, f, g, h, i)	Prohibited	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, b, c, d, e, f, g)	Prohibited (except under GP – conditions a, b, c, d, e, f, g)	Prohibited (except under GP – conditions a, b, c, d, e, f, g, h)	Prohibited (except under GP – conditions a, b, c, d, e, f, g, h)	Prohibited	Prohibited (except under GP – conditions a, b, c, d, e, f, g)	Prohibited
OA		Prohibited	Prohibited	Prohibited (except under SpP – conditions a, b, c, e)	Prohibited	Prohibited	Prohibited	Allowed under normal jurisdictional requirements	Allowed under normal jurisdictional requirements	Allowed under normal jurisdictional requirements	Allowed under normal jurisdictional requirements	Prohibited	Allowed under normal jurisdictional requirements	Allowed under normal jurisdictional requirements

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

a Disposal facility refers to the site where product is ultimately disposed of. It does not refer to facilities where treatment is applied before product is transported to a subsequent destination.

b DCPFs and APFs include commercial compost facilities and processors. ZPs other than those being used as disposal facilities are only to receive effluent or manure. Commercial processors include pet meat suppliers and renderers where treatment is applied before release.

c BCILR (burial, composting, incineration, landfill, rendering) disposal options should be available within the CA, whereas rendering facilities may not be.

Permit conditions for Table 6.8:

a) Will involve a risk assessment to determine whether the risk associated with the movement is acceptable within the response, including any conditions required to manage the product at the receiving premises.
b) Biosecurity practices, including decontamination, must be implemented for vehicles and equipment when entering and exiting properties known or likely to be contaminated, to minimise the risk of disease spread.
c) Transport must be undertaken in a biosecure manner and in leakproof trucks, vehicle trays or containers.
d) Transport by main roads/highways and not transiting through a property or stopping en route adjacent to a known pig production area.
e) Transport vehicles and containers are decontaminated (cleaned and disinfected) immediately upon unloading and under supervision (government, industry or accredited third party).
f) Any material permitted for movement must not be brought into direct or indirect contact with susceptible livestock.
g) The receiving premises must implement biosecurity standards that minimise the risk of contaminated product contributing to viral spread and must have mechanisms that minimise the likelihood of wild/feral animals accessing the waste product material.
h) Material must be treated in a manner that meets requirements for inactivation of ASF virus before further movement of material to another destination.
i) Movement only considered where there is no disposal facility in the same declared area.

6.4.9 Recommended movement controls for empty livestock transport vehicles and associated equipment

Vehicles that have been used to transport live pigs, and equipment used with live pigs or their products must be thoroughly decontaminated after use and between loads.

Decontamination applies to movements of vehicles and equipment that have had direct contact with pigs or their products into, within and out of RAs and CAs. Movement of these vehicles and equipment should be as per the relevant movement control matrix.

Further information on decontamination procedures and site preparation is available in the **AUSVETPLAN operational manual *Decontamination*** and nationally agreed standard operating procedure (NASOP) *Decontamination of large equipment*.[34]

6.4.10 Recommended movement controls for people and nonsusceptible animals

Movements of people and nonsusceptible animals, including working/hunting dogs, off IAs, IPs, DCPs, SPs and TPs will be controlled and subject to appropriate decontamination procedures to prevent mechanical spread of ASF virus. Within the RA and the CA, people and working/hunting dogs that regularly travel from location to location and come into contact with high-risk items (eg domestic or feral pigs, pig products, waste, property and things that could become contaminated with virus – see also Section 4.3.11) will be required to undergo appropriate decontamination of themselves, and their overgear, equipment and vehicles between locations, and keep detailed records of their movements. Unnecessary movements of people and nonsusceptible animals, including working/hunting dogs, onto and off premises in the IA and the RA should be prevented.

Further information is available in NASOP 01: *Personal decontamination – entry and exit procedures* and NASOP 26: *Decontamination of groups of people – entry and exit procedures*.[35]

6.4.11 Recommended movement controls for vehicles and equipment used to destroy or transport feral pig carcasses

Biosecurity requirements in Sections 6.4.9 and 6.4.10 apply to hunters and their vehicles.

6.4.12 Recommended movement controls for stockfeed, stock feedstuffs and bedding

The term ‘stockfeed’ includes crops, grains, hay, silage and mixed feeds, as well as any materials used for pig bedding material. The term ‘stock feedstuffs’ includes stockfeed as well as supplements (such as vitamins and minerals) and other additives (such as antibiotics). Where possible, the TP or SP status should be resolved before any movement of feedstuffs off the premises is considered.

The movement of stockfeed grown and harvested from paddocks on pig premises may be allowed but will be dependent on a number of factors, including:

- premises classification and area of origin
- whether paddocks from which the stockfeeds were harvested were treated with pig effluent/manure, and the period between treatment and harvest

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[34] https://animalhealthaustralia.com.au/nationally-agreed-standard-operating-procedures
[35] https://animalhealthaustralia.com.au/nationally-agreed-standard-operating-procedures

- how long and at what temperature the stockfeeds have been stored on the premises postharvest
- where the stockfeeds have been grown and stored in relation to the pig production area
- the confirmation of, or uncertainty of, ASF virus in feral pigs in the area where the stockfeed has been harvested
- likelihood of paddock or feed contamination by infected feral pigs
- intended destination and end use of the stockfeed and feedstuffs.

The risk assessment for an IP, DCP, SP and TP should consider:

- if and when paddocks from which the stockfeed was harvested were treated with pig effluent/manure before the first clinical signs consistent with ASF
- how long the stockfeed and feedstuffs have been stored on the premises postharvest
- the environmental and product temperature at which the stockfeed and feedstuffs have been stored on the premises postharvest
- where the stockfeed has been grown in relation to the pig production area (proximity, segregation, security and risk of cross-contamination)
- where the stockfeed and feedstuffs have been stored postharvest in relation to the pig production area (proximity, segregation and risk of cross-contamination)
- any other potential contamination of harvested or stored stockfeed by effluent/manure or other material of pig origin, or vectors such as rodents or fomites (eg contaminated machinery) and time when this occurred
- likelihood of paddock or feed contamination by feral pigs
- intended destination and end use of the stockfeed and feedstuffs (eg ZP, feedmill producing pig feed, bulk grain handler such as Grain Corp that may supply pig feedmills)
- further processing of the stockfeed and feedstuffs (eg pelleting)
- vehicle movements and vehicles as fomites.

The risk assessment for a feedmill situated on a pig premises should consider:

- the position of the feedmill relative to the pig production area and the risk of cross-contamination
- whether feedmill staff also work in the pig production area, and biosecurity and decontamination protocols for movements between these areas
- whether vehicles or other equipment are shared between the feedmill and pig production area
- potential movements of rodents or other vectors that act as fomites between the feedmill and pig production area
- whether the same road is used to access the feedmill and pig production area
- the source/origin of feed ingredients
- the destination of the feed – premises status, declared area (RA, CA, OA)
- whether the feedmill uses mixed lines or single-line feed production systems
- vehicle and equipment decontamination practices between deliveries.

Records must be kept of all movement of stockfeed and feedstuffs originating from premises with domestic or feral pigs in the RA and CA. The records should include date of harvest, commodity type, date of dispatch, destination, whether the product originated from a paddock treated with effluent or manure, and date treated.

Table 6.9 describes the recommended movement controls for stock feedstuffs and bedding within and between declared areas.

Table 6.9 Recommended movement controls for stock feedstuffs and bedding within and between declared areas

To→ / From ↓		RA							CA				OA			
		Disposal facility[a] (which must also be a ZP)	**DCP**	**SP, TP**	**ARP**	**ZP (other than feedmill or bulk storage facility)**	**Feedmill[b]**	**Feedmill[c]**	**POR**	**ZP (other than feedmill or bulk storage facility)**	**Feedmill[b]**	**Feedmill[c]**	**Pig premises**	**ZP (other than feedmill or bulk storage facility)**	**Feedmill[b]**	**Feedmill[c]**
RA	**IP, DCP, SP, TP[e]**	Prohibited (except under SpP – conditions a, c, e, f)	Prohibited	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, c, d, e, f)	Prohibited (except under SpP – conditions a, b, c, d, e, f)	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, c, d, e, f)	Prohibited (except under SpP – conditions a, b, c, d, e, f)	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
	IP, DCP, SP, TP[f]	Prohibited (except under SpP – conditions a, c, e, f)	Prohibited	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, c, d, e, f)	Prohibited (except under SpP – conditions a, b, c, d, e, f)	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, c, d, e, f)	Prohibited (except under SpP – conditions a, b, c, d, e, f)	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, c, d, e, f)	Prohibited (except under SpP – conditions a, b, c, d, e, f)	Prohibited
	Feed mill[g]	Prohibited (except under SpP – conditions a, c, e, f)	Prohibited	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, b, c, d, e, f)	Prohibited	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, b, c, d, e, f)	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
	ARP	Prohibited (except under SpP – conditions a, c, e)	Prohibited (except under SpP – conditions a, c, d, e)	Prohibited (except under SpP – conditions a, c, d, e)	Prohibited (except under SpP – conditions a, c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions a, b, c, d, e)	Prohibited (except under GP – conditions a, c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under SpP – conditions a, b, c, d, e, f)	Prohibited	Prohibited (except under SpP – conditions a, c, d, e)	Prohibited (except under SpP – conditions a, b, c, d, e, f)	Prohibited

To→ From ↓		RA							CA				OA			
		Disposal facility[a] (which must also be a ZP)	**DCP**	**SP, TP**	**ARP**	**ZP (other than feedmill or bulk storage facility)**	**Feedmill[b]**	**Feedmill[c]**	**POR**	**ZP (other than feedmill or bulk storage facility)**	**Feedmill[b]**	**Feedmill[c]**	**Pig premises**	**ZP (other than feedmill or bulk storage facility)**	**Feedmill[b]**	**Feedmill[c]**
	Feed mill[h]	Prohibited (except under SpP – conditions a, b, c, e)	Prohibited (except under SpP – conditions a, b, c, d, e)	Prohibited (except under SpP – conditions a, b, c, d, e)	Prohibited (except under SpP – conditions a, b, c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under SpP – conditions a, b, c, d, e)	Prohibited (except under SpP – conditions a, b, c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under SpP – conditions a, b, c, d, e)	Prohibited	Prohibited (except under SpP – conditions a, b, c, d, e)	Prohibited (except under SpP – conditions a, b, c, d, e)	Prohibited
	Feed mill[i]	Prohibited (except under SpP – conditions b, c, e)	Prohibited (except under SpP conditions b, c, d, e)	Prohibited (except under SpP – conditions b, c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under SpP – conditions b, c, d, e)	Prohibited (except under SpP – conditions b, c, d, e)	Prohibited (except under SpP – conditions b, c, d, e)	Prohibited (except under SpP – conditions b, c, d, e)
CA	**DCP, SP, TP[e]**	Prohibited (except under SpP – conditions a, c, e)	Prohibited	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, c, d, e)	Prohibited (except under SpP – conditions a, b, c, d, e)	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, c, d, e)	Prohibited (except under SpP – conditions a, b, c, d, e)	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
	DCP, SP, TP[f]	Prohibited (except under SpP – conditions a, c, e)	Prohibited	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, c, d, e)	Prohibited (except under SpP – conditions a, b, c, d, e)	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, c, d, e)	Prohibited (except under SpP – conditions a, b, c, d, e)	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, c, d, e)	Prohibited (except under SpP – conditions a, b, c, d, e)	Prohibited
	Feed mill[j]	Prohibited (except under SpP – conditions a, b, c, e)	Prohibited	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, b, c, d, e)	Prohibited	Prohibited	Prohibited	Prohibited (except under SpP – conditions a, b, c, d, e)	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited

To→ From ↓		RA							CA				OA			
		Disposal facility[a] (which must also be a ZP)	**DCP**	**SP, TP**	**ARP**	**ZP (other than feedmill or bulk storage facility)**	**Feedmill[b]**	**Feedmill[c]**	**POR**	**ZP (other than feedmill or bulk storage facility)**	**Feedmill[b]**	**Feedmill[c]**	**Pig premises**	**ZP (other than feedmill or bulk storage facility)**	**Feedmill[b]**	**Feedmill[c]**
	POR	Prohibited (except under SpP – conditions c, e)	Prohibited (except under SpP – conditions a, c, d, e)	Prohibited (except under SpP – conditions a, c, d, e)	Prohibited (except under SpP – conditions a, c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under SpP – conditions a, b, c, d, e)	Prohibited (except under SpP – conditions a, c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under SpP – conditions a, b, c, d, e)	Prohibited	Prohibited (except under SpP – conditions a, c, d, e)	Prohibited (except under SpP – conditions a, c, d, e)	Prohibited
	Feed mill[k]	Prohibited (except under SpP – conditions a, b, c, e)	Prohibited (except under SpP – conditions a, b, c, d, e)	Prohibited (except under SpP – conditions a, b, c, d, e)	Prohibited (except under SpP – conditions a, b, c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under SpP – conditions a, b, c, d, e)	Prohibited (except under SpP – conditions a, b, c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under SpP – conditions a, b, c, d, e)	Prohibited	Prohibited (except under SpP – conditions a, b, c, d, e)	Prohibited (except under SpP – conditions a, b, c, d, e)	Prohibited
	Feed mill[i]	Prohibited (except under SpP – conditions b, c, e)	Prohibited (except under SpP – conditions b, c, d, e)	Prohibited (except under SpP – conditions b, c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under SpP – conditions b, c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under SpP – conditions b, c, d, e)
OA		Prohibited (except under SpP – conditions a, c, e)	Prohibited (except under SpP – conditions a, c, d, e)	Prohibited (except under SpP – conditions a, c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Prohibited (except under GP – conditions c, d, e)	Allowed under normal jurisdictional requirements	Allowed under normal jurisdictional requirements	Allowed under normal jurisdictional requirements	Allowed under normal jurisdictional requirements

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

a Disposal facility refers to the site where product is ultimately disposed of. It does not refer to facilities where treatment is applied before product is transported to a subsequent destination.
b NOT making pig feed, or a bulk storage facility NOT supplying ingredient for pig feed or bedding.
c Making pig feed, or a bulk storage facility supplying ingredients for pig feed or bedding.
d A pig production area is sheds and paddocks used for pig production in both indoor and outdoor farming systems.
e Treated with pig manure/effluent
f NOT treated with pig manure/effluent
g Situated on an IP, DCP, SP or TP
h Situated on an ARP
i Situated on a ZP
j Situated on a DCP, SP or TP
k Situated on a POR

Permit conditions for Table 6.9:

a) For the dispatch of stock feedstuffs or bedding from or to an IP, DCP, SP, TP, ARP or POR, or from the OA to a disposal facility, a government officer or an appropriately skilled independent person approved by the CVO is to undertake a risk assessment, with particular attention to the presence of feral pigs and the potential for contamination with ASF virus. (Note: This will require the risk assessment to consider the uncertainty around infected feral pigs contaminating stock feedstuffs.) The risk assessment will include whether the dispatcher can meet the permit conditions listed below [and demonstrate maintenance of minimum biosecurity standards[36]].
b) For the dispatch of stock feedstuffs or bedding from or to a feedmill, a government officer or an appropriately skilled independent person approved by the CVO is to undertake a risk assessment of site infection risks on the feedmill. The risk assessment will include whether the feedmill can meet the permit conditions listed below [and demonstrate maintenance of minimum biosecurity standards].
c) Records of all stock feedstuff movements must be recorded.
d) [The dispatching and receiving premises must meet minimum biosecurity standards.]
e) Transport vehicles must comply with applicable property entry/exit biosecurity requirements. Where required, transport vehicles and containers must be decontaminated (cleaned and disinfected) immediately upon unloading and under supervision (government, industry or accredited third party).
f) Material permitted for movement must not be brought into direct or indirect contact with susceptible livestock.

[36] ['Minimum biosecurity standards' – Australian Pork Industry Quality Assurance Program (APIQ) accreditation or equivalent to the APIQ biosecurity standards and the *National farm biosecurity manual for pork production* (November 2019)]

7 Surveillance and proof of freedom

7.1 Surveillance

The key objectives and priorities for surveillance in response to an outbreak of African swine fever (ASF) are outlined in Section 4.3.3.

7.1.1 Specific considerations

Specific considerations for surveillance for ASF include the following:

- The presentation of ASF may vary considerably with the virulence of the virus strain.
- ASF may present similarly to many endemic diseases, and laboratory investigation is required for diagnosis.
- Captive pig populations include those that are part of commercial, smallholding and backyard production; domestic pets; and pigs held in educational farms, petting zoos, zoos and so on.
- Surveillance of feral pig populations will be important because they may act as reservoirs of infection, and to provide evidence to support proof of freedom.
- Surveillance of potential tick vector species and other vectors (eg biting insects), as appropriate, will be required.

The types of surveillance that are most appropriate for ASF are:

- active surveillance of premises identified through tracing to determine whether they contain infected animals and/or contaminated items – this may include field surveillance (ie property visits), telephone surveillance and regular review of herd records
- active surveillance at congregation points (eg saleyards, abattoirs, scales) to identify pigs showing clinical signs that have not been identified through tracing
- enhanced passive surveillance to detect premises and feral pig populations containing infected animals showing clinical signs that were not identified through tracing – this will involve encouraging producers, animal health professionals, other members in the pig supply chain, pig hunters, local government, zoos and so on to report pigs showing signs consistent with ASF.

Active surveillance of healthy pigs and other pigs with no known links to the outbreak (eg at slaughter, during field visits to premises with pigs) is unlikely to be an efficient way of detecting cases of ASF. However, it could be considered in some situations – for example, if producer-led reporting is not adequate for the population at risk (eg feral pigs), for a widespread outbreak or for proof of freedom.

Other activities to complement the above surveillance techniques include retrospective examination of abattoir records for high condemnation rates for findings consistent with ASF, and retrospective examination of samples submitted to laboratories from instances of disease that could have been ASF.

Using ropes to collect oral fluids has been demonstrated to be effective for ASF (Grau et al 2015), and may have a place for in-herd surveillance. It is not a recommended approach to investigating suspect cases.

7.1.2 Premises surveillance

Domestic animals

Surveillance activities (eg field visits, telephone surveillance[37]) should be prioritised based on risk, as indicated by the premises classification. Where the number of these premises is large and available resources are limited, further prioritisation may be required. This should take into consideration the likelihood that infection may be present, and the risk of further disease transmission and dissemination in both domestic and feral pig populations.

Surveillance on infected premises (IPs)

Surveillance on IPs may be useful to:

- confirm that infection is present, if the premises was classified as an IP without laboratory confirmation
- confirm the infection status of any rare and valuable animals (particularly if alternative disease control measures are being considered)
- aid epidemiological understanding of the outbreak, including on large premises – for example
  - clinical monitoring if the presentation of ASF is atypical
  - genetic mapping or other characterisation of the virus present – for example, if the IP is not linked to other areas of infection, or periodically throughout the outbreak to monitor for changes in virus virulence or characterisation.

Where laboratory investigation is required, the selection of animals to sample should be based on risk, and consider the presence of distinct epidemiological units or groups of animals on the premises. It should include enough animals to be representative of each distinct population present. Animals to target for sampling include:

- dead animals
- animals showing clinical signs consistent with ASF
- animals most likely to be severely affected (considering risk factors such as age, or exposure to a high viral load environment, etc)
- animals introduced to the premises in the tracing window of interest (as these may be a source of infection)
- animals more likely to be infected (eg those with a history of recent exposure to other animals, such as breeding males with higher numbers of matings recently; those returned from aggregation points, such as saleyards)
- rare and valuable animals.

Surveillance on suspect premises (SPs)

Veterinary investigation of SPs is a priority and should occur as soon as practical after suspicious signs are recognised and reported.

Given the range of clinical presentations of ASF, it is possible that many SPs will require investigation. As a general guide, SPs with epidemiological links to IPs should be investigated as the highest priority; those with no epidemiological links to IPs should be considered a lower priority. (There are many endemic causes of clinical signs similar to ASF, and therefore many

[37] A clinical assessment proforma may be emailed or telephoned in at the nominated frequency, summarising mortalities, removals to a hospital pen and treatments.

reports will not be due to ASF. However, to ensure that producers are not discouraged from reporting, it is important that authorised government officers or personnel directed by the jurisdictional authority conduct surveillance to resolve these cases in a timely manner, as far as possible.)

SPs in the outside area (OA) are a higher priority for investigation than those in the control area (CA) or restricted area (RA).

SPs in the CA are a higher priority for investigation than those in the RA.

SPs with rare and valuable animals are a higher priority for investigation than those of equivalent risk status but without such animals.

On SPs, the approach should be as follows:

- An epidemiologically representative sample of pigs on the premises should be examined for clinical signs that could be consistent with ASF.
- Samples should be taken from all pigs found to be showing (even vague) clinical signs or from recent mortalities. Appropriate samples should also be collected to enable testing for differential diagnoses.
- Healthy pigs should be sampled for molecular and serological testing. Detection of virus may identify preclinical but shedding animals. Detection of seroconversion will help indicate how long ASF virus may have been present on the premises and provide data for epidemiological investigations.
- If not already done, an investigation should be conducted to determine whether the premises may be epidemiologically linked to the outbreak.
- The approach to assessing dangerous contact premises (DCPs) or dangerous contact processing facilities (DCPFs) as negative, following completion of control activities, is outlined in Section 5.4.

The timing of laboratory testing and the period of observation/quarantine may be affected by:

- the virulence of the circulating virus strain – for example, a shorter period between laboratory testing rounds or a shorter period of observation may be enough if highly virulent virus is circulating with more acute presentation and dramatic clinical signs
- proximity to other cases in the area – for example, if there are other cases nearby, a more extended period of observation may be preferable
- the strength of epidemiological links to other cases
- potential involvement of feral pigs – for example, if ongoing contact with feral pigs cannot be ruled out, a more extended period of observation may be preferable.

If negative test results are reported, but there remains an epidemiological link to an IP, the property status may revert to DCP, and measures for this new status will need to be completed.

Surveillance on trace premises (TPs)

Prioritisation of TP surveillance (eg field visits, telephone surveillance) should be based on risk, and informed by advice on mortalities and production records on the premises. It should consider the likelihood that infection may be present, and the risk of further disease transmission and dissemination if the animals are infected.

The approach to surveillance of live pigs on TPs should be consistent with the guidance for surveillance on SPs. In addition, where the premises was identified through tracing of contaminated animal products, wastes or things, consideration should be given to surveillance, including sampling for laboratory investigation, where warranted (eg using molecular techniques such as PCR testing where the presence of ASF virus contamination cannot be otherwise ascertained).

Producer-led reporting of any clinical signs consistent with ASF or changes in production statistics may be used on lower-priority TPs while awaiting further assessment from authorised officers.

If live pigs on the premises show clinical signs consistent with ASF, the premises should be considered an SP, and the guidance on surveillance and assessment of SPs followed.

The approach to assessing TPs as negative, following completion of control activities, is outlined in Section 5.4.

Surveillance on dangerous contact premises (DCPs) and dangerous contact processing facilities (DCPFs)

Surveillance activities (eg field visits, telephone surveillance) should be prioritised based on risk. Surveillance of live pigs on DCPs and DCPFs should be consistent with the guidance for surveillance on SPs.

Where the premises has been allocated a DCP or DCPF classification because of the potential presence of contaminated animal products, wastes or things (eg the environment, feed), these items should also be subject to decontamination and/or disposal, or sampling for laboratory investigation, where warranted (eg using molecular techniques such as PCR testing where the presence of ASF virus contamination cannot be otherwise ascertained).

The approach to assessing DCPs or DCPFs as negative, following completion of control activities, is outlined in Section 5.4.

Surveillance on other premises with live pigs (at-risk premises (ARPs) in the RA, premises of relevance (PORs) in the CA, and premises in the OA)

The aim of surveillance on ARPs, PORs and premises in the OA will be to detect infection (new IPs) as early as possible, while minimising opportunities for inadvertent spread of ASF virus through field visits.

Methods of surveillance may include:

- inspection of all at-risk herds or groups by owners or managers
- veterinary investigation of mortality or abortion events
- monitoring and review of production records and producer health reports[38]
- phone interviews
- field inspection and sampling by veterinary or animal health surveillance teams.

[38] This may include diagnostic testing on pigs scheduled for movement, or background surveillance testing of 'normal' sick and dead pigs to exclude ASF.

The frequency and method(s) of surveillance chosen for individual premises will depend on the assessed risk (including from vector and feral pig transmission), the number of premises to monitor and the available resources.

The initial approach to surveillance on ARPs, PORs and other premises with pigs in the OA would include raising awareness of the range of clinical presentations of ASF and using producer (or owner)-led reporting of clinical signs or changes in production statistics. This should be accompanied by the provision of biosecurity advice, to help prevent the introduction and/or further spread of disease.

Surveillance activities would be based on risk; for example, ARPs may be considered a higher priority for such visits, particularly ARPs close to IPs. Abattoir surveillance may also be useful for monitoring the status of pigs from these premises.

The timing and frequency of active surveillance visits in the CA and the OA may differ from those in the RA. For logistical purposes (and to minimise the risk of disease spread), it may be useful to separate management and resourcing of surveillance in the CA from that in the RA.

Additional surveillance activities on these premises may subsequently be required to provide evidence to support proof of freedom.

Surveillance of sentinels used in restocking

Use of sentinel pigs when restocking premises following depopulation and decontamination may be considered. Use of sentinels, including staged repopulation using sentinels, will only occur on the presumption that it does not create additional risk that cannot be effectively and efficiently managed.

The decision to use sentinels should take into consideration:

- confidence in the decontamination process
- consequences for disease control if decontamination was incomplete
- the potential involvement of tick vectors.

Sentinel pigs may be introduced as a staged approach to repopulation – that is, introducing sufficient numbers to all relevant areas to ensure confidence in the decontamination process. Where sentinel pigs are introduced before full restocking, the following guidance should be considered:

- Sentinel pigs should not be placed until it is considered that there is no viable virus in the environment to which pigs are to be introduced. The actual time before placement should consider a range of factors, including those described in Section 2.4.2 and Appendixes 2 and 3, including
  - the matrix or substrate in which ASF virus exists
  - ambient temperature
  - water content
  - ASF virulence and vial shedding
  - the potential involvement of tick vectors
  - confidence in the decontamination process (eg types of surfaces and substrates that were decontaminated).
- Sentinel pigs should be PCR-negative and seronegative for ASF before placement.

- Based on advice from the Food and Agriculture Organization of the United Nations, it is recommended that sentinels should make up approximately 10% of the normal stocking rate (FAO 1999) and that, ideally, enough sentinels are in each pen on the farm where pigs with clinical ASF were found. Where multiple pens in multiple sheds were infected, groups of sentinels will be held in each pen of each infected shed and monitored daily for clinical signs of disease.
- Laboratory investigation should be undertaken on
  - any pigs that show clinical signs of ASF
  - any mortalities occurring during the sentinel period (including postmortem examination and collection of appropriate tissue samples; see Section 2.5.4)
  - sentinels every 2 weeks (molecular diagnostics and serology) for 40 (Beltrán-Alcrudo et al 2017), 42 (FAO 1999) or 45 (Official Journal of the European Communities 2002, Dzhailidi et al 2014) days.
- Where sentinels are used as part of a premises repopulation process, sample numbers may be determined based on epidemiology.
- If the epidemiological assessment indicates that ticks are suspected or known to be involved in the epidemiology of the disease, the World Organisation for Animal Health (OIE) specifies a sentinel period of 2 months for IPs (OIE 2018b). This 2-month period may be included wholly or partly within the 3-month proof-of-freedom phase. Testing should be done every 2 weeks (as above) for the duration of the sentinel period.
- If any sentinel pigs are confirmed as infected with ASF virus, the premises should be considered an IP and relevant control measures undertaken.
- If all sentinel pigs remain negative for the presence of ASF virus throughout the sentinel period, the premises may be assessed negative. Full restocking could then proceed, provided that restocking does not create additional risk that cannot be effectively and efficiently managed – for example, use of sentinels and restocking are not likely to be permitted in declared areas of active infection (eg the RA).

Other surveillance

Surveillance of feral pig populations and any implicated vector species (soft ticks, biting insects) will also be required; see Sections 4.3.12 and 4.3.13, respectively.

7.2 Proof of freedom

Providing confidence that ASF is no longer present in Australia will be important to satisfy trading partners and regain access to international markets, and to underpin import controls to prevent the reintroduction of ASF.

Chapter 15.1 of the OIE *Terrestrial animal health code* lists the criteria by which a country, zone, compartment or establishment may be considered free from ASF. The surveillance framework must meet these requirements, and must provide sufficient evidence that there is no detectable ASF virus infection in domestic and feral pigs at a selected prevalence of disease, and that statistical confidence limits are robust enough to satisfy the OIE and trading partners. The recommended approach to surveillance in feral pigs is provided in Appendix 9.

The role of *Ornithodoros* or other soft-bodied ticks in the transmission and persistence of ASF will need to be elucidated and explained in a dossier to demonstrate freedom. The OIE requires 3 months of negative surveillance after the disinfection of the last infected premises and implementation of an appropriate surveillance program in domestic and feral pigs for a country

to regain ASF freedom. If ticks are involved, the surveillance program must use sentinel pigs for 2 months, as per Article 15.1.7 of the Terrestrial Code. Given that this measure could only be used on domestic pig premises, there is a need for further research on the role of existing species of *Ornithodoros* and other soft-bodied ticks in Australia in relation to feral pigs and potential ASF transmission.

Finding evidence of infection at any prevalence in the feral pig population automatically invalidates any freedom claim unless otherwise stated in the relevant chapters of the Terrestrial Code.

Although the OIE provides guidelines for recovering ASF-free status, acceptance of this status following an outbreak will have to be negotiated with individual trading partners and may take considerably longer than the minimum periods prescribed in the Terrestrial Code.

A key requirement for the OIE and trading partners will be evidence of an effective surveillance program capable of detecting infection if it is present in the population, and analysis of data to support the case for disease freedom. Descriptions of the veterinary services, demographics of susceptible populations and relevant industry structures should be included to justify the design of the surveillance program.

Specific recommendations for this surveillance will be developed using the technical expertise of competent and experienced epidemiologists, and will be based on the characteristics of the outbreak. The surveillance program will need to be carefully designed and followed to ensure that it produces sufficient data that are reliable and acceptable to the OIE and international trading partners, while avoiding being excessively costly and logistically complicated. The surveillance program will include clinical, serological and molecular surveillance of relevant susceptible domestic and feral pig populations. It will include targeted and random components, and will build on the surveillance, diagnostic testing, tracing and epidemiological assessment conducted during the response phase.

In addition to the recommendations in the Terrestrial Code, the design of the program will consider the general and specific considerations for ASF surveillance outlined in Section 7.1.

Appendix 1

AFRICAN SWINE FEVER FACT SHEET

Disease and cause

African swine fever (ASF) is a viral disease of pigs that is clinically indistinguishable from several other important emergency and endemic pig diseases, including classical swine fever, Aujeszky's disease, erysipelas and salmonellosis. Depending on strain virulence, infection can result in high morbidity and mortality. The disease is caused by species of *Asfivirus*. It has been responsible for serious economic and production losses overseas.

Occurrence in Australia

There have been no outbreaks of ASF in Australia.

Species affected

ASF is not a zoonotic disease.

ASF only infects domestic and feral pigs – including warthogs, other African wild hogs and Timorese warty pigs. There are no known human health risks associated with eating meat and pork products from affected animals.

Key signs

Although the literature refers to an incubation period for ASF of 4–19 days, for the purpose of this manual, the World Organisation for Animal Health (OIE) incubation period of 15 days is used.

ASF can have a number of clinical presentations, depending on the virulence of the virus strain. Pigs can be found dead with no prior clinical signs. They can have acute clinical signs, including fever, depression, anorexia, hyperaemia or cyanosis of extremities (particularly the ears and snout), incoordination and laboured breathing. Mortality rates vary but can reach up to 100%, depending on the strain virulence. A chronic form of the disease can occur in pigs that survive, resulting in transient fever, weight loss, pneumonia and arthritis. These pigs may become persistent shedders of the virus.

Clinical signs alone cannot be used to differentiate ASF from some other diseases of pigs; laboratory testing must be used to diagnose the disease.

Spread

ASF virus is shed in faeces, urine and haemorrhagic secretions of infected pigs. Although the virus has been recovered from semen, there is no evidence of actual disease transmission by this route.

Disease transmission occurs via direct contact with infected pigs; ingestion of infected pig products; or contact with contaminated premises, equipment or people – including contaminated livestock transporters, and other vehicles such as cars and feed trucks travelling on contaminated routes.

Feral pigs can become an important reservoir for the virus, and may lead to secondary spread to domestic piggeries. Control practices involve strict biosecurity management, with sanitary destruction and disposal of pig carcasses.

Persistence of the agent

ASF virus is an enveloped virus and is stable at a wide range of pH levels in serum-free medium (approximately pH 3.9–11.5); serum increases the stability of the virus. The virus remains viable when frozen but may be inactivated by heat.

Appendix 2

VIABILITY OF AFRICAN SWINE FEVER VIRUS UNDER DIFFERENT SCENARIOS

Expected African swine fever (ASF) virus inactivation times under varying environmental temperatures

Davies et al (2017) have determined the half-life of ASF virus in blood, urine and faeces (Table A2.1).

Table A2.1 Half-life of viable ASF virus

Substrate	Half-life (days)			
	4 °C	12 °C	21 °C	37 °C
Faeces (solid)	0.65	0.50	0.39	0.29
Urine	2.19	1.07	0.68	0.41

Source: Davies et al (2017)

Indicative times for environmental degradation or inactivation of viable virus in a scenario where highly virulent virus is present in blood, urine and faeces in contaminated indoor areas; the initial virus titre of blood is assumed to be high ($10^{8.7}$) (Guinat et al 2014); and the desired end titre is low ($<10^{1}$) (Gallardo et al 2013) are as follows, using the half-life in urine (as the longest half-life for blood, urine and faeces) (Davies et al 2017):

- At 4 °C ambient temperature
  - half-life of 2.19 days
  - time would be 57 days.
- At 12 °C ambient temperature
  - half-life of 1.07 days
  - time would be 28 days.
- At 21 °C ambient temperature
  - half-life of 0.68 days
  - time would be 18 days.
- At 37 °C ambient temperature
  - half-life of 0.41 days
  - time would be 11 days.

Beltrán-Alcrudo et al (2017) proposed exposure to sunlight as a means of decontaminating equipment that cannot be decontaminated by other means; however, they did not provide guidance on the time needed to inactivate ASF virus.

Appendix 3

DETECTION TIMES FOR AFRICAN SWINE FEVER VIRUS DNA UNDER DIFFERENT SCENARIOS

Expected African swine fever (ASF) virus DNA detection times under varying environmental temperatures

Davies et al (2017) have determined the half-life of ASF DNA in faeces, urine and oral fluid (Table A3.1).

Table A3.1 Half-life of ASF virus DNA

Substrate	Half-life (days)			
	4 ºC	12 ºC	21 ºC	37 ºC
Faeces (solid)	9.95	9.48	9.00	8.25
Urine	32.54	27.99	24.18	19.48
Oral fluid	2.75	2.72	2.67	2.60

Source: Davies et al (2017)

Indicative times for finding ASF virus DNA in a scenario where highly virulent virus is present in blood, urine and faeces in contaminated indoor areas; the initial virus titre of blood is assumed to be high ($10^{8.7}$) (Guinat et al 2014); and the desired end titre is low ($<10^{1}$) (Gallardo et al 2013), are as follows, using the half-life in urine (as the longest half-life for oral fluids, urine and faeces) (Davies et al 2017):

- At 4 ºC ambient temperature
  - half-life of 32.54 days
  - time would be 846 days.
- At 12 ºC ambient temperature
  - half-life of 27.99 days
  - time would be 728 days.
- At 21 ºC ambient temperature
  - half-life of 24.18 days
  - time would be 629 days.
- At 37 ºC ambient temperature:
  - half-life of 19.48 days
  - time would be 506 days.

Appendix 4

FACTORS FOR A RESPONSE TO AFRICAN SWINE FEVER IN AUSTRALIA

The critical factors for a response to African swine fever (ASF) in Australia include the following in terms of domestic pigs, feral pigs or both:

Factors	Deduction and implication	Relevant to	
		Domestic pigs	Feral pigs
Susceptible species • All domestic and feral pig species are susceptible to infection in Australia. Suid species kept under zoological conditions may also be susceptible. In this manual, the term 'pig' is used to refer to all susceptible species in Australia.	**Susceptible species** • All suids are susceptible and must be considered for control purposes.	✓	✓
• There are no public health implications.	**Human health** • Community must be reassured that pork is safe to eat.	✓	✓
Clinical signs • ASF is a highly variable disease. It can vary from disease with high morbidity and high case mortality to a very mild disease, depending on the genotype involved.	**Diagnostic testing** • Genotyping will be critical to understanding the expected syndromes to be observed clinically.	✓	✓
• Given the similarity of ASF to many endemic and exotic diseases, laboratory confirmation is required for diagnosis.	• Differential diagnoses include exotic and endemic diseases.	✓	✓
	• A wide spectrum of diseases should be tested for to ensure their detection.	✓	✓
Persistence of agent and modes of transmission • ASF virus is shed in high concentrations in secretions and excretions during the acute phase of the disease.	**Disposal and decontamination** • The quantum of virus directly influences the decontamination requirements. Less decontamination will require longer timeframes to ensure that sufficient virus log reductions have occurred to reduce the infection pressure and risk.	✓	✓

Factors	Deduction and implication	Relevant to	
		Domestic pigs	Feral pigs
	Tracing • Tracing must be undertaken to rapidly identify trace premises (TPs) and conduct investigations to determine source and spread of disease. This includes human-assisted movements of live animals and fomites.	✓	✓
	Surveillance • Surveillance of pig populations must be undertaken to ensure early detection before a response; rapid detection during a response, delimiting the distribution and extent of disease spread; and proof of freedom following eradication efforts.	✓	✓
	Biosecurity controls • Biosecurity controls must be implemented on declared premises and in declared areas to minimise the risk of virus transmission.	✓	✓
• ASF virus may remain viable for extended periods under some Australian environmental conditions (eg in cooler, wetter areas).	**Disposal and decontamination** • Disposal and decontamination measures must be undertaken commensurate with risk.	✓	✓
• ASF virus may remain viable under some heat treatments. Heat treatment of meat and meat products to 100 °C for 30 minutes is thought to inactivate the virus.	**Biosecurity controls** • Rendered pig product from declared premises requires consideration of the likelihood of virus transmission in the rare case that quality controls of rendered product are not being met and ASF virus is not being inactivated.	✓	
• Aerosols do not play a significant role in disease transmission between herds, but are important for transmission within herds and between animals in close contact.	**Declared areas** • The size of the restricted area does not need to account for windborne spread.	✓	✓

Factors	Deduction and implication	Relevant to	
		Domestic pigs	Feral pigs
• The virus remains viable for extended periods in suitable substrates (ie urine, faeces, protein) and when frozen.	**Disposal and decontamination** • Total cleaning and removal of all animal secretions and excretions (eg faeces, urine, blood) are essential before disinfection begins.	✓	✓
	Biosecurity controls • As above	✓	✓
• The quantum of virus within the environment will influence decontamination procedures.	**Disposal and decontamination** • The persistence of ASF virus in the environment may present challenges in decontaminating some premises in a timely manner.	✓	✓
	Declared areas • Declaration of an infected area (IA) will assist with identifying potentially contaminated lands.		✓
• ASF virus may persist in the environment (eg contaminated ground/death sites) and in carcasses, resulting in a prolonged source of infection for feral pigs.	**Disposal and decontamination** • Removal and sanitary disposal of feral pig carcasses should be undertaken, where feasible. • Decontamination of the immediate death site should be undertaken, where feasible.		✓
	Biosecurity controls • As above	✓	✓
• Pigs infected by less virulent virus strains or surviving acute disease may shed virus for more than 1 month following recovery.	**Epidemiology and policy amendments** • Infection with mild virus strains may require modifications to the approach provided here, as the approach provided is for more virulent strains.	✓	✓
	• Infection with less virulent virus will require heightened clinical and laboratory surveillance, test and slaughter campaigns, and potentially wider eradication campaigns in feral animals.	✓	✓

Factors	Deduction and implication	Relevant to	
		Domestic pigs	Feral pigs
Laboratory tests • Tests are available for rapid detection of ASF virus, but early diagnosis of an outbreak may be delayed if ASF is present in the mild form, or if initial infections are in small, noncommercial pig herds or feral pigs.	**Diagnostic testing** • ASF should be considered in differential diagnoses even where clinical signs are vague or nonspecific.	✓	✓
	• With any suspicion, diagnostic testing is recommended.	✓	✓
Factors influencing transmission • Transmission of ASF in Australia will most likely occur via the movement of animals, animal products and fomites when this results in contact with other pigs. ASF virus is unlikely to be transmitted over long distances without human assistance.	**Disease prevention** • Australian border controls are the critical first step in preventing disease entry. Efforts must be made to reduce the likelihood of disease entry through communications, interceptions and regular testing of confiscated product.	✓	✓
	• Swill feeding must be prohibited before, during and after a response.	✓	✓
	Movement controls • Human-assisted movements of live animals, pork, pork products and contaminated items must be managed.	✓	✓
	• Aggregations of live pigs at pig shows, pig saleyards and pig scales must be managed.	✓	
	Biosecurity controls • As above	✓	✓
• Movement of the virus by fomites (including trucks) has been proven.	**Movement controls** • Human-assisted movements of live animals, pork, pork products and contaminated items must be managed.		
	• Movement controls will be applied to fomites.	✓	✓
	• Arthropod vectors, including biting insects and ticks, will	✓	✓

Factors	Deduction and implication	Relevant to	
		Domestic pigs	Feral pigs
	require assessment and management, as appropriate.		
Vaccination and treatment • No vaccine or effective treatment is available.	**Stamping-out policy** • Other controls must be applied, including destruction, disposal and decontamination.	✓	
	Animal welfare • Animal welfare needs must be addressed.	✓	
Demographics and populations • Smallholder pig populations may not be easily identified or located.	• Control measures should support self-identification, and verification of premises details with jurisdictional governments and industry.	✓	
• Feral pig populations may not be easily identified or located.	**Surveillance** • Surveillance to identify pig populations may be undertaken pre-emptively or 'just in time' to inform control activities.		✓
Early detection surveillance • Any delay in notification from pig owners or hunters will lead to delays in response and prolonged response activities.	**Public information** • A public information campaign about domestic and feral pigs must be targeted towards relevant stakeholders.	✓	✓
• People may not recognise or report the disease, or seek assistance.	**Compensation and public information** • Compensation payments may aid early reporting.	✓	
Social and economic effects • Market fluctuations due to public health perceptions or product withdrawals would likely reduce the value of the industry.	**Control policies** • Control actions need to be undertaken rapidly to reduce disease spread, and prolonged impacts on domestic and export markets.	✓	✓
• Trade in pig products will be affected.	• Control actions need to be undertaken rapidly to reduce disease spread, and prolonged impacts on domestic and export markets.	✓	✓

Factors	Deduction and implication	Relevant to	
		Domestic pigs	Feral pigs
	• Compartmentalisation and zoning need to be considered.	✓	✓
• Destruction and disposal of culled pigs may require substantial resources and may cause community concerns.	**Public information** • A public information campaign must address the need for the agreed strategy.	✓	✓
	Disposal • Disposal is typically the rate-limiting step. Disposal must keep up with destruction to avoid disposal backlogs.	✓	✓
	Disposal and decontamination • Culled feral pigs should ideally be removed and disposed of in a sanitary manner.		✓
• Loss of animals in herds and zoos may result in loss of important genetics and species (including rare breeds).	**Stamping-out policy – rare and valuable animals** • Development of a policy for rare and valuable animals will need to be considered.	✓	✓
	• A risk-based case-by-case approach must be taken to managing these animals.	✓	✓
Animal welfare • Animal activists may influence public perceptions around animal welfare.	**Destruction** • Mass animal destruction decisions (ie the decision to destroy or not) and methodology may affect the implementation of control strategies (eg destruction, welfare slaughter).	✓	✓
	Public information • A public information campaign needs to address the rationale for the planned strategy.	✓	✓
	Feed stores will need to be managed appropriately for the duration of control.	✓	

Factors	Deduction and implication	Relevant to	
		Domestic pigs	Feral pigs
Response surveillance • Feral pig surveillance and control measures, where warranted, may be difficult to implement. This may be due to difficulty in finding and destroying pigs, mobilising resources into a region, undertaking ground control once arrived in the region, and undertaking aerial control and/or carcass removal.	**Stamping-out policy** • Finding feral pigs for control purposes can be challenging and may not be complete.		✓
	• Feral pig destruction and disposal, and decontamination of sites may only be appropriate in certain areas.		✓
	• Feral pigs that are infected but not controlled may remain as a reservoir of infection.		✓
Destruction • Most large abattoirs kill a single species, so accessing pig abattoirs may have some logistical issues because they may not be willing to accept pigs from potentially infected premises. Multispecies domestic abattoirs may also be unwilling to accept pigs during an outbreak.	**Destruction** • Both situations may result in difficulties finding slaughter pathways for some sectors of the industry.	✓	
	• Alternatives will need to be explored.	✓	
	• Incentives may need to be provided.	✓	

Appendix 5

THE EPIDEMIOLOGICAL UNIT

In the context of infectious disease, an epidemiological unit is a group of animals that share the same likelihood of exposure to a pathogen.[39] This may be because they share the same environment (eg animals in a pen) or they share some of the same management practices (eg the same personnel or equipment used in different sheds).

To decide if animals belong to the same epidemiological unit, consideration needs to be given to how the disease agent (eg virus) is transmitted from one animal to another – for example, by direct contact between animals, by contact with body discharges or manure, or through insect bites.

Biosecurity practices that prevent such contact are also important. For example, if the disease can be transmitted through viruses remaining in body fluids or manure, then clothing or equipment contaminated with the fluid or manure could transfer the virus between animal groups in separate housing. These animal groups would then be considered as the same epidemiological unit. However, biosecurity practices such as cleaning or disinfecting boots and equipment, showering, and changing clothes may reduce the chances of transferring the virus between animal houses.

In the context of African swine fever in a modern piggery, the primary transmission pathways are through:

- direct animal-to-animal contact
- contact with and/or consumption of animal products (meat and meat products), byproducts or waste products
- contaminated feed and bedding
- equipment and personal items contaminated with virus (equipment, clothes, footwear), vehicles, trucks and transporters.

Other possible transmission pathways include insects and ticks, semen, and embryos.

In the context of a disease event, it may be best to consider groups of susceptible animals sharing the same environment, management practices and transmission pathways as the same epidemiological unit. Similar treatment can then be applied to groups of animals in each epidemiological unit (eg all destroyed). Exceptions can be made if it can be proven that there is no epidemiological connection between groups of animals.

It may also be possible to rank epidemiological units from highest risk to lowest risk, according to the likelihood that an infective dose has been transferred between groups. This might be useful to prioritise groups of animals for testing or destruction.

[39] www.cabi.org/isc/glossary/94766

Appendix 6

DECLARED AREA CONSIDERATIONS FOR DOMESTIC AND FERAL PIGS

For both domestic and feral pigs:

- epidemiology of African swine fever (ASF) (eg the incubation period, the expected silent spread phase (when determining initial size of declared areas), transmission pathways, the ease and speed of transmission of the pathogen, preclinical virus shedding, the estimated dissemination ratio)
- known human-assisted and natural movements of pigs and risk materials (eg tracing and surveillance data)
- known active and passive surveillance data, including data from chiller boxes, abattoirs and processors, local government control programs (baiting, trapping, hunting), vehicle collisions and hunters
- known or expected geographic distribution of the virus
- length of time infection is thought to have been present in the area (eg the silent spread phase), and therefore where subclinical infection may be present
- location and distribution of populations of susceptible animals (including feral pigs) in the area, including
  - patterns of pig movements, including seasonal movements of feral pigs
  - proximity to domestic pig populations, including smallholdings, free-range piggeries and housed piggeries
  - production type in the area (eg commercial/smallholder, free range/housed) and associated biosecurity
  - likelihood of interaction between domestic and feral pig populations
- location of key elements in industry supply chains (eg abattoirs, renderers, artificial breeding centres)
- likely local active insect and tick vector species, and their distribution and expected dispersal[40]
- location, distribution and dispersal in the area of populations of nonsusceptible animals (eg rodents) and insects, which may act as mechanical vectors
- expected rate of spread of ASF due to local dispersal associated with susceptible and nonsusceptible animals (see Section 2.4.3)
- impacts on the industry of the disease control measures compared with the expected benefits of disease control
- prevailing weather conditions (and so the expected persistence of ASF virus)
- local land use (eg presence of national parks, heritage sites)
- known characteristics of ASF virus
- confidence in the accuracy of available information

[40] If *Stomoxys* spp. are present (eg tabanids), Bailey et al (1973) suggest that a minimum 3.2 km restricted area radius should be applied around a feral pig infected area.

- likelihood of interaction between domestic and feral pigs – consider the type of production housing in the area (eg indoors, outdoors) and biosecurity
- international practices, including protection zones around infected areas (feral pigs).[41]

For feral pigs:

- feral pig environment (ie habitat suitability and seasonality, age/sex and fecundity of infected animals, expected and maximum range of feral pigs, feral pig population overlap or continuity, terrain and barriers to movement, density of feral pigs, active insect vectors, proximity to domestic pig populations)
- direct horizontal transmission from other infected feral pigs[42]
- surveillance data in the local government area from pig control (baiting, trapping, hunting) by local government area authorities and landholders
- likely and maximum ranging distances
- local indirect transmission through contaminated environments (infected carcasses, remnants of infected animals (eg offal abandoned by hunters), contaminated soil or plant material, excretions)
- human-assisted transmission (through fomites and contaminated products (eg trophies) or items used in pig hunting, through movement of live feral pigs)
- animal dispersion from hunting, chasing, and so on – the **AUSVETPLAN operational manual *Wild animal response strategy*** [to be updated] notes that temporary movements resulting from disturbance range from 5 km to a maximum of 55 km; this is indicative only.

For feral pigs only, the expected size of the restricted area (RA) should be informed by the factors above, focusing on the likely roaming range in the predicted silent spread phase. For example, if it is expected that detection would not have occurred for at least 2 months, a minimum RA radius of 6 km around each infected area (IA) is recommended.

[41] Following confirmation of ASF in domestic pig holdings, European Union authorities establish a protection zone (equivalent to a restricted area) with a radius of at least 3 km around the outbreak site, which will itself be included in a surveillance zone (equivalent to a control area) with a radius of at least 10 km from the outbreak site (Article 9 of Council Directive 2002/60/EC).

[42] Guberti et al (2019) indicate that natural geographical spread of ASF in wild boar populations with a density typical for northern and eastern Europe occurs at a speed of about 1–3 km/month, resulting in a 12–36 km expansion of the endemic zone in a year.

Appendix 7

RECOMMENDED TECHNICAL AND DISEASE RISKS TO BE ASSESSED WHEN DECIDING MOVEMENT PERMITS

Table A7.1 Risks identified and addressed through movement control permit conditions

Category of risk	Risk	Commodity/matrix[a]			
		Live pigs (see Section 6.4.1)	**Semen and embryos (see Sections 6.4.2–6.4.3)**	**Domestic pig carcasses, stillborn piglets and placentas for disposal off farm (see Section 6.4.6)**	**Waste products and effluent off farm (see Section 6.4.7)**
Movement of infected or contaminated commodity	Infected or contaminated commodities or vehicles may be moved and spread ASF virus.	a, b, c, d, e, f, g, h, i, j, k, l, m, n, o	a, b, c, d, e, f	a, b, c, d, e, f, g, h, i	a, b, c, d, e, f, g, h, i
Movement of infected/contaminated commodity	Decontamination measures (eg rendering, composting, disinfection) are ineffective and commodities may be released, leading to further spread of ASF virus.	h		f, g	b, h
Movement across declared areas or jurisdictions	Moved commodities do not meet the receiving jurisdiction's import requirements and/or intrastate declared area movement requirements.	Underlying general principle	Underlying general principle	Underlying general principle	Underlying general principle
Aggregations	Multiple consignments per load may lead to spread of ASF virus.	c			
Traceability	Commodities are not traceable.	l	f, g	b	
Travel routes	The route travelled (including premises entry/exit practices) may contribute to ASF virus spread.	e, f	h	a, b, c, d	b, d, e
Biosecurity standards/controls	Disease may spread [if source and destination premises do not meet minimum biosecurity standards].[b]	g	a, b, c, f		g

Category of risk	Risk	Commodity/matrix[a]			
		Live pigs (see Section 6.4.1)	**Semen and embryos (see Sections 6.4.2–6.4.3)**	**Domestic pig carcasses, stillborn piglets and placentas for disposal off farm (see Section 6.4.6)**	**Waste products and effluent off farm (see Section 6.4.7)**
Biosecurity standards/controls	Moved commodities are not segregated at the destination premises or premises en route, leading to spread of ASF virus.	m	h		f
Biosecurity standards/controls	Vehicles may spread ASF virus if not decontaminated.	h, i	h	f, g	b, c, e
Further risk assessment	Conditions identified in the matrices do not consider all risks (see also Section 2).	d	a	b	a

a Letters refer to movement permit conditions for respective commodity movements.

[b Minimum biosecurity standards – Australian Pork Industry Quality Assurance Program (APIQ) accreditation or equivalent to the APIQ biosecurity standards and the *National farm biosecurity manual for pork production* (November 2019).]

Table A7.2 Risks not identified or addressed through movement control permit conditions that may need to be assessed

Category of risk	Risk
Biosecurity standards/controls	Pigs incubating infection may have been recently introduced to the premises. This requires consideration of both domestic and feral pigs. Consider: • abundance in the area • known movement patterns • biosecurity controls (eg exclusion fencing; controls (baiting, trapping, hunting)), which inform the likelihood of interaction between feral and domestic pigs.
Biosecurity standards/controls	ASF virus may have been introduced to, and/or spread from, the premises on fomites (eg people, vehicles, equipment) in the period when the virus may remain viable on the contaminated fomite (if it is not decontaminated). This requires consideration of: • vehicles (trucks and trailers) for movement of pigs (live or dead), waste, semen, feed and other goods • vehicle decontamination procedures and facilities on premises of origin and destination • people involved in the movements (eg drivers, animal handlers) • equipment, personal items and other goods being moved into or out of the piggery production area • personal hygiene and personnel biosecurity (eg clean clothes and footwear) • decontamination procedures and facilities on premises of origin and destination for all people movements • piggery cleaning and disinfection program • facilities and protocols for loading and unloading of pigs and other commodities (eg semen), including level of segregation from pig production areas.

Biosecurity standards/controls	Vectors (other than feral pigs), including *Stomoxys* flies, may introduce ASF virus to the premises. This requires consideration of farm pest/vermin control programs.
Biosecurity standards/controls	Sufficient biosecurity controls are not in place on the source or destination (as appropriate) premises (eg fencing in good repair, gates that shut, closed doors on sheds, insect controls, loading ramps, decontamination facilities).
Biosecurity standards/controls	Pork products (cooked or uncooked) or pet food are introduced to the production area and available for pigs to eat.
Biosecurity standards/controls	Movement, production and biosecurity records may not be available or accurate. This requires consideration of: • movements of live pigs, semen, staff, visitors and contractors • feed deliveries • other deliveries • daily pig inspections • mortalities and morbidities • inventory and production data • laboratory reports • vermin control • feral pig activities • cleaning and disinfection.
Early detection	ASF may be present in the herd but not yet detected due to vague clinical signs or low contagiousness, in combination with an expected level of mortality or morbidity in a herd, or due to inadequate recording and monitoring of pig ill-health and mortalities. This requires close consideration of: • pig health (clinical inspection of animals) • pig health and production records

	• veterinary and laboratory reports.

Appendix 8

COMMENTS ABOUT THE ASSESSED NEGATIVE QUALIFIER WITH RESPECT TO MOVEMENT OF PIGS

Comments about the assessed negative qualifier

At-risk premises (ARPs) and premises of relevance (PORs) that are to move pigs to the outside area (OA) for slaughter must meet the traceability, routeing and biosecurity requirements for the prescribed movement.

Surveillance activities must provide evidence that African swine fever (ASF) is not present on the ARPs or PORs from which pigs are to be moved, if they are to be considered assessed negative (AN).

Any suspicion of disease will be investigated, and no permits for live pig movements will be issued until the disease status of the pigs to be moved has been determined.

Given the likely virulence of the virus in this population, and the short incubation period, it is unlikely that sampling only of apparently healthy pigs by PCR or serological testing will be a cost-effective and practical surveillance method. However, sampling of apparently healthy pigs may be required to complement the clinical/syndromic surveillance if sufficient confidence levels for absence of disease are not achieved through clinical/syndromic surveillance.

Logistical considerations such as transport and testing time for samples, and the availability of livestock trucks, will also affect the implementation of this policy.

Surveillance on ARPs

ARPs must demonstrate a high level of confidence of freedom to manage the risks associated with live pig movements to the OA.

Measures required to demonstrate this confidence will be at the discretion of the jurisdictional chief veterinary officer (CVO) and will be articulated in the jurisdictional Emergency Animal Disease Response Plan (EADRP). Not all surveillance measures may be required.

Suitable surveillance measures may include:

- initial inspection of the site, including a clinical inspection of pigs; this could be by a government or third-party veterinarian, or another person authorised by the CVO in the jurisdiction the premises is located in
- recording and sharing morbidity and mortality records, and the history of reporting and investigation of suspected clinical signs of disease
- testing by PCR of all or a subsample of sick and dead pigs on the premises once a week, or within a nominated period, before loadout; farm workers could be trained to take samples
- sampling and testing of oral fluids once a week, from ropes placed in random pens
- sampling and testing of clinically healthy pigs to achieve required confidence levels for evidence of absence of ASF

- monitoring of antemortem and postmortem inspection results of pigs from the premises sent to the abattoir in the past week
- targeted sampling of all dead, suspect or condemned pigs antemortem and/or postmortem collected by meat inspectors or veterinarians for each batch of pig carcases in the abattoir.

Surveillance on PORs

PORs have a lower likelihood of having infected pigs than ARPs.

Measures required to demonstrate confidence that infected pigs are not moved from PORs to the OA will be at the discretion of the jurisdictional CVO and will be articulated in the jurisdictional EADRP. Not all surveillance measures may be required.

Suitable surveillance measures may include:

- recording and sharing morbidity and mortality records, and the history of reporting and investigation of suspected clinical signs of disease
- testing by PCR of all or a subsample of sick and dead pigs on the premises every 15 days (ie OIE incubation period), or within a nominated period, before loadout; farm workers could be trained to take samples
- sampling and testing of oral fluids every 15 days, from ropes placed in random pens
- sampling and testing of clinically healthy pigs to achieve required confidence levels for evidence of absence of ASF
- monitoring of antemortem and postmortem inspection results of pigs from premises sent to the abattoir in the past week
- targeted sampling of all dead, suspect or condemned pigs antemortem and/or postmortem.

Appendix 9

RECOMMENDED APPROACH TO SURVEILLANCE IN FERAL PIGS

The World Organisation for Animal Health (OIE) recognises that surveillance in feral pigs has potential challenges associated with feral pig behaviour, habitat, accessibility and associated logistics. It recommends (Article 15.1.32 of the *Terrestrial animal health code*) that a passive surveillance program for African swine fever (ASF) should include feral pigs found dead, road kills, animals showing abnormal behaviour and hunted animals, and should also include awareness campaigns targeted at hunters and farmers.

There may be situations where a more targeted surveillance program can provide additional assurance. The most suitable approach will depend on the size and type of disease outbreak, and associated available response resources and budget, but is most likely to consist of a surveillance system analysis using a scenario tree constructed from multiple surveillance types with associated sensitivity calculations.

Surveillance approaches

Representative survey of feral pig population within country, zone or compartment

The ability to complete a representative proof-of-freedom survey will depend on the cost and resources available and, by inference, the size of the area in question, the population of feral pigs and logistical factors. The time taken to complete the survey and the time for which the survey will be relevant are also considerations, because a single survey only provides information about a defined period of time. Unless the outbreak is relatively small and/or isolated, this method on its own is likely to be cost- and resource-prohibitive in Australia.

Complex surveillance system analysis using multiple data sources and scenario trees

Possible data sources include:

- passive surveillance (eg samples from feral pigs found dead or sick, or shot by hunters or land managers completing feral pig culls)
- reports from hunters, land managers and the general public
- previous surveillance and samples from infected areas (IAs), restricted areas (RAs) and feral pig destruction areas
- previous surveillance samples
- historical records
- environmental sampling (eg faeces, soil around feral pig carcasses)
- use of sentinel animals (eg collared feral pigs and subsequent sample collection).

Targeted surveillance programs

Targeted surveillance programs can provide additional assurance and increase the sensitivity of a surveillance design. The criteria to define high-risk areas for targeted surveillance include:

- areas with a history of ASF, such as the IA, RA and feral pig destruction areas
- subregions with large populations of wild or feral pigs
- regions that have borders with ASF-infected areas

- interfaces between feral pig and domestic pig populations
- areas with farms with free-ranging and outdoor pigs
- areas with a high level of hunting activity, where animal dispersion and feeding, as well as inappropriate disposal of waste, can occur
- other risk areas determined by the jurisdiction, such as seaports, airports, garbage dumps, and picnic and camping areas, where there may be unsanitary disposal of risk materials
- arthropod surveys in areas of feral pig populations.

Disease prevalence estimates

Proof-of-freedom surveillance will require an estimate of disease prevalence to calculate the system sensitivity and associated confidence intervals. The disease prevalence estimate can provide important information about the success of disease control measures, and the likely success of any eradication campaign versus a move to disease mitigation or transition to management.

Glossary

Disease-specific terms

Term	Definition
Cyanosis (adj. cyanotic)	Blueness of the skin and/or mucous membranes due to insufficient oxygenation of the blood.
Hyperaemia	An increase in the amount of blood in a tissue or organ due to dilation of the supplying arteries.
Infected area	The infected area may be legally declared around sites where feral animals are confirmed as infected and where the pathogen is thought to be present in the environment.
Petechiae	Tiny, flat red or purple spots in the skin or mucous membrane caused by bleeding from small blood vessels.
Pig production area	Sheds and paddocks used for pig production in both indoor and outdoor farming systems.
Rendering	Processing by heat to inactivate infective agents. Rendered material may be used in various products according to particular disease circumstances.
Transovarial transmission	Occurs in certain arthropod vectors as they transmit pathogens from parent arthropod to offspring arthropod.
Trans-stadial transmission	When a pathogen remains with the vector from one life stage ('stadium') to the next.

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, 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 (CSIRO-ACDP) and the Australian Government 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	*Aus*tralian *Vet*erinary 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. *See also* 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. *See also* 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.
Disinsectation	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. *See also* 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 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. *See also* 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. *See also* 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 *Terrestrial animal health code*. Describes standards for safe international trade in animals and animal products. Revised annually and published on the internet at: www.oie.int/en/what-we-do/standards/codes-and-manuals/terrestrial-code-online-access.
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/what-we-do/standards/codes-and-manuals/terrestrial-manual-online-access.
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.
Process slaughter	The slaughter of infected, potentially infected or at-risk animals at an abattoir.
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.
Qualifiers	
– assessed negative	Assessed negative (AN) is a qualifier that may be applied to ARPs, PORs, SPs, TPs, DCPs or DCPFs. The qualifier may be applied following surveillance, epidemiological investigation, and/or laboratory assessment/diagnostic testing and indicates that the premises is assessed as negative at the time of classification.
– sentinels on site	Sentinels on site (SN) is a qualifier that may be applied to IPs and DCPs to indicate that sentinel animals are present on the premises as part of response activities (ie before it can be assessed as an RP).
– vaccinated	The vaccinated (VN) qualifier can be applied in a number of different ways. At its most basic level, it can be used to identify premises that contain susceptible animals that have been vaccinated against the EAD in question. However, depending on the legislation, objectives and processes within a jurisdiction, the VN qualifier may be used to track a range of criteria and parameters.
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. Modified stamping out is the approach of slaughtering the animals at an accredited abattoir to produce a marketable product, where this is deemed suitable.
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', means material of mammalian origin, or any substance that has come in contact with this material, but does not include: (i) milk, milk products or milk byproducts either of Australian provenance or legally imported for stockfeed use into Australia (ii) material containing flesh, bones, blood, offal or mammal carcases that is treated by an approved process[1] (iii) 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 (iv) material used under an individual and defined-period permit issued by a jurisdiction for the purposes of research or baiting. [1] In terms of (ii), approved processes are: 1. rendering in accordance with the Australian Standard for the Hygienic Rendering of Animal Products 2. under jurisdictional permit, cooking processes subject to compliance verification that ensure that a core temperature of at least 100 °C for a minimum of 30 minutes, or equivalent, has been reached 3. treatment of cooking oil, which 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 4. under jurisdictional permit, any other nationally agreed process approved by AHC for which an acceptable risk assessment has been undertaken and that is subject to compliance verification. The national definition is a minimum standard. Some jurisdictions have additional conditions for swill feeding that pig producers in those jurisdictions must comply with, over and above the requirements of the national definition.
Swill feeding	Also known as 'feeding prohibited pig feed', it includes:

	• feeding, or allowing or directing another person to feed, prohibited pig feed to a pig • allowing a pig to have access to prohibited pig feed • the collection and storage or possession of prohibited pig feed on a premises where one or more pigs are kept • supplying to another person prohibited pig feed that the supplier knows is for feeding to any pig. This definition was endorsed by the Agriculture Ministers' Council through AGMIN OOS 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	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).
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

Disease-specific abbreviations

Abbreviation	Full title
ADS	approved disposal site
ASF	African swine fever
CSF	classical swine fever
HAD	haemadsorbing dose
IA	infected area

Standard AUSVETPLAN abbreviations

Abbreviation	Full title
ACDP	Australian Centre for Disease Preparedness
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
NMG	National Management Group
OA	outside area

Abbreviation	Full title
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
TP	trace premises
UP	unknown status premises
ZP	zero susceptible species premises

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