AUSTRALIAN VETERINARY EMERGENCY PLAN

AUSVETPLAN

1996

Disease Strategy

African swine fever

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

Agriculture and Resource Management Council of Australia and New Zealand

This Disease Strategy forms part of:

AUSVETPLAN Edition 2.0, 1996

[AUSVETPLAN Edition 1.0, was published in 1991]

This strategy will be reviewed regularly. Suggestions and recommendations for amendments should be forwarded to the AUSVETPLAN Coordinator (see Preface).

Record of amendments to this manual:

There are occasional minor differences in the page breaks between the paper version and this electronic version which we can unfortunately not avoid.

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PREFACE

This **Disease Strategy** for the control of **African swine fever (ASF)** is an integral part of the **Australian Veterinary Emergency Plan**, or AUSVETPLAN (Edition 2.0). AUSVETPLAN structures and functions are described in the **Summary Document**.

This strategy sets out the disease control principles that were approved in February 1991 by the then Australian Agricultural Council out-of-session at meeting number 135, for use in a veterinary emergency caused by the introduction of African swine fever to Australia. The strategy has since been updated and revised. The strategy has been upgraded and approved by the Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) out-of-session in January 1996.

African swine fever is designated as a List A disease by the Office International des Epizooties (OIE). List A diseases are, 'Communicable diseases which have the potential for serious and rapid spread, irrespective of national borders; which are of serious socioeconomic or public health importance and which are of major importance in the international trade of animals and animal products'. The principles contained in this document for the diagnosis and management of an outbreak of African swine fever conform with the **OIE International Animal Health Code 1992** (OIE Code; Appendix 3).

ASF is included in the list of diseases for which arrangements exist under the Commonwealth/States cost-sharing agreement for the eradication of certain exotic animal diseases. Information on the cost-sharing arrangements can be found in the AUSVETPLAN **Summary Document** and in the **Valuation and Compensation Manual.**

Detailed instructions for field implementation of the strategies are contained in the AUSVETPLAN **Operational Procedures Manuals** and **Management Manuals.** Cross-references to strategies, manuals and other AUSVETPLAN documents are expressed in the form:

Document Name, Section no.
For example, **Decontamination Manual, Section 3**.

In addition, *Exotic Diseases of Animals: A Field Guide for Australian Veterinarians* by W.A. Geering, A.J. Forman and M.J. Nunn, Australian Government Publishing Service, Canberra, 1995 (**Exotic Diseases Field Guide**) is a source for some of the information about the aetiology, diagnosis and epidemiology of the disease and should be read in conjunction with this strategy.

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

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The writing group was responsible for drafting this strategy. However, the text may have been amended at various stages of the consultation/approval process and the policies expressed in this version do not necessarily represent the views of all members of the writing group. Contributions may also have been made by other people not listed above and the assistance of all involved is gratefully acknowledged.

CONTENTS

1 NATURE OF THE DISEASE

African swine fever (ASF) is a highly contagious disease that may cause high or low mortality rates, fever, hyperaemia of the skin and a variety of 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 diseases are best distinguished from each other by laboratory tests.

1.1 Aetiology

ASF virus was, until recently, considered to be a member of the family Iridoviridae. However, it has now been shown that some features of ASF virus have more in common with poxviruses than iridoviruses (DNA arrangement and the presence within the virion of enzymes necessary for the synthesis and modification of early viral RNA). The result is that ASF virus is no longer classified as an iridovirus but its uniqueness precludes it being incorporated into any existing virus family and it is therefore presently unclassified (Francki et al 1994).

1.2 Susceptible species

Domestic and feral pigs (*Sus scrofa*) are the only species susceptible in Australia. In Africa, the African wart-hog (*Phacochoerus aethiopicus*), African bush pig (*Potamochoerus porcus*) and possibly the African giant forest hog (*Hylochoerus meinertzhageni*) are susceptible to infection but do not show clinical signs. They are important in the epidemiology of the disease in Africa.

1.3 World distribution and occurrence in Australia

ASF is present in most of sub-Saharan Africa. In 1957, the disease spread to Portugal, where it was eradicated, but it re-appeared in 1960 and quickly spread to Spain. ASF remains endemic in the Iberian peninsula and this region has been a major source for spread to other countries. ASF is now under good control in both Spain and Portugal and mainly restricted to feral pigs in only small areas of both countries. The disease spread to France, Italy (now endemic in Sardinia), Malta, Belgium, Holland, Cuba, Brazil, Dominican Republic and Haiti. In most cases it has been eradicated. In the cases of Malta and the Dominican Republic, ASF was eradicated by the total elimination of pigs from these countries (Geering et al 1995).

There have been no occurrences in Australia.

1.4 Diagnostic criteria

[For terms not defined in the text see Glossary]

1.4.1 Clinical signs Error! Bookmark not defined.

ASF is a very variable disease. In its most spectacular form there is high morbidity and mortality. However, it can be a very mild disease. There are several forms of the disease.

Peracute form:
- pigs found dead with no prior clinical signs.

Acute form:
- fever up to 42°C;
- hyperaemia or cyanosis of extremities, particularly ears and snout;
- loss of appetite/irregular appetite;
- inability or unwillingness to stand up/convulsions;
- incoordination/stiff gait;
- huddling together/piling one on top of another;
- laboured breathing/coughing;
- dysentery or diarrhoea;
- conjunctivitis;
- mucopurulant nasal discharge;
- vomiting;
- abortion;
- case fatality rate up to 100%;
- severe reduction of white blood cells;
- course — 1 to 7 days.

Subacute form:
- clinical signs as listed under acute but generally milder and persisting longer (3–4 weeks);
- fever may fluctuate irregularly (>40.5°C);
- occasional pigs may go purple all over;
- case fatality rate lower — death rate is usually higher in younger pigs;
- bleeding from injection sites;
- abortion.

Chronic form (generally pigs surviving the subacute form):
- recurrent transient fever;
- ill thrift (failure to thrive), stunting and emaciation;
- pneumonia (laboured breathing/coughing);
- arthritis;
- cutaneous ulcers;
- death — often due to secondary bacterial infections;
- pigs may become chronic carriers without showing any of the clinical signs listed above.

1.4.2 Pathology

Gross lesions

Acute form:
- lymph nodes are enlarged and haemorrhagic often resembling blood clots — the gastrohepatic, renal, mesenteric and submandibular lymph nodes are most often affected;
- spleen may be enlarged (2–3 times normal size), dark, friable or pulpy;
- haemorrhages can occur in almost any organ. They are most commonly seen on serosal membranes and in kidneys (as subcapsular petechiae), heart, urinary bladder, lung and gall bladder;
- septal oedema of lungs resulting in prominent interlobular septa; and
- fluid in body cavities.

Subacute form:
- findings are more variable than for the acute form;
- lymph node and renal haemorrhage;
- enlarged but not congested spleen;
- lobular consolidation of cranial lung lobes; and
- haemorrhage of the intestinal lining, lymph nodes and kidney.

Chronic form:
- enlarged lymph nodes;
- fibrinous pericarditis and pleurisy;
- lobular consolidation of lungs — may progress to lobular necrosis;
- small hard nodular white masses in lungs;
- arthritis;
- cutaneous ulcers;
- poor body condition.

Microscopic lesions (histopathology)

Extensive necrosis of lymphatic tissue is common, particularly in lymph nodes with karyorrhexis (nucleus fragmentation in degenerating granular leucocytes) of lymphocytes, and this may be accompanied by haemorrhage. Necrosis is more severe and frequent with ASF than CSF. There is vasculitis, with degeneration of endothelium and fibrinoid degeneration of artery walls in all organs. There is inflammation of the brain, spinal cord and spinal nerves not involving pus with necrosis of mononuclear cell cuffs around affected vessels.

1.4.3 Laboratory tests

Animal specimens should initially be sent to the State or Territory diagnostic laboratory from where they will be forwarded to the Australian Animal Health Laboratory (AAHL), Geelong for exotic disease testing after obtaining the necessary clearance from the chief veterinary officer (CVO) of the State or Territory of the disease outbreak and informing the CVO of Victoria (for transport of the specimens to Geelong).

Specimens required

For virus testing:
- whole blood in EDTA anticoagulant from live sick animals
- the following tissues collected aseptically at autopsy and forwarded unpreserved: tonsils, spleen, lymph nodes (gastrohepatic, mesenteric), lung, kidney, liver, and ileum.

For antibody testing:
- sera from animals suspected of having subacute or chronic disease (possibly 20 maximum).

For histopathology:
A full range of tissues in neutral-buffered saline.

Tissue samples should be taken immediately before autopsy from affected pigs that have been killed and from pigs that have recently died. Details of sample collection, transport, storage and processing are provided in Geering et al (1995).

Transport of specimens

Blood samples and unpreserved tissue specimens should be chilled and transported with frozen gel packs. If prolonged delays are anticipated, tissues should be frozen and

forwarded on dry ice (Geering et al 1995). For further information see the **Laboratory Preparedness Manual, Section 6 and Appendix 3**.

Laboratory diagnosis

The tests used at AAHL for diagnosis of ASF are shown in Table 1 and include:

- detection of viral antigens in tissues using direct immunofluorescence and ELISA (in the peracute and acute forms of the disease, diagnosis is based on the detection of virus in viral antigen);
- demonstration of antibodies in serum samples using serological tests such as immunodiffusion and ELISA; and
- transmission trials.

Table 1 Diagnostic tests currently available at AAHL for African swine fever

Test	Specimen required	Test detects	Time taken to obtain result
ELISA	tissue/whole EDTA blood	antigen	6–8 hours
Virus isolation and haemadsorption	tissue/whole EDTA blood	virus	2–10 days
Electron microscopy	tissue/whole EDTA blood	virus	3–4 hours
Direct fluorescent antibody test of frozen sections	fresh tissue	antigen	3–4 hours
ELISA	serum	antibody	3–4 hours
Immunodiffusion	serum	antibody	1–2 days
Animal inoculation	tissue/whole EDTA blood	virus	8–12 days

Source: Information provided by AAHL, 1995 [refer to AAHL for the most up-to-date information].

1.4.4 Differential diagnosis

In the field, suspicion will be based on clinical signs and gross pathological lesions. Several pigs must be autopsied as there may be great variability in lesions presented in individual animals. A composite picture of all lesions seen should be recorded. Pigs dying of the peracute form of the disease may show no gross lesions.

There have been substantial delays in initial diagnoses of ASF in countries where CSF is endemic. ASF was not diagnosed until four weeks after the initial infection in both Belgium (1985) and Holland (1986), which both have comprehensive, competent veterinary services.

Other diseases that must be considered in the differential diagnosis of ASF are:

- Aujeszky's disease
- erysipelas
- salmonellosis
- various poisons including warfarin
- pasteurellosis/pneumonia
- any cause of ill thrift (failure to thrive)
- any cause of abortion, mummification, stillbirths or weak piglets

- mulberry heart disease
- thrombocytopenia purpura
- classical swine fever
- viral encephalomyelitis

1.5 Resistance and immunity

1.5.1 Innate and passive immunity

The Australian pig herd is totally susceptible to ASF.

1.5.2 Active immunity

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

1.5.3 Vaccination

There is no vaccine available against ASF.

1.6 Epidemiology

1.6.1 Incubation period

The incubation period is usually 5–15 days but may be as long as 20 days. The OIE Code gives the maximum incubation period for ASF, for regulatory purposes, as 40 days (see Appendix 3).

1.6.2 Persistence of the virus

General properties/environment

ASF virus survives for prolonged periods under most environmental conditions and is resistant to many treatments that readily inactivate other pathogens (McDaniel 1980). It is not inactivated by freezing and thawing. ASF virus can be inactivated in liquid media by heating at 60°C for 30 minutes (MacDiarmid 1991) (see also Section 2.2.6).

ASF virus is stable in a wide range of pH (pH 4–10). However, the intact virus is very sensitive to lipid solvents and detergents and also to oxidising agents such as hypochlorite as well as substituted phenols (Plowright et al 1994) (see Section 2.2.8).

Live animals

During the acute disease, infected pigs shed virus in high concentrations in secretions and excretions containing blood. Pigs infected by mild virus strains or those surviving acute disease usually become chronically infected for several months or longer. However, virus is not readily excreted by such pigs for longer than about five or six weeks after their initial infection (Geering et al 1995). According to another author most recovered pigs are virus carriers for long periods, perhaps for life (McDaniel 1980).

Animal products and by-products

The virus may survive for many months in raw, unprocessed frozen meat. ASF virus has been recovered after 150 days from infected 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).

The 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. It has also been recovered from processed hams after 5 months of storage and from the bone marrow of such hams stored for 6 months (McDaniel 1980).

In the Belgian outbreak the European Union required that pigmeat produced in the infected area be sealed in hermetically closed containers and held at a temperature of at least 60°C for a period of four hours and for at least 30 minutes of this period above 70°C. On one farm 115 pigs were exhumed 3 months after they died. No virus was detected in their tissues, however lesions were present and antibodies were detected.

Fomites

Infected premises have been shown to remain infective for pigs for 3 days after depopulation but, in some cases, not after 5 days. However, epidemiologic data indicates that the virus remains viable on some premises for 3 months or longer.

1.6.3 Modes of transmission

Live animals

Spread is by direct contact with infected pigs or ingestion of products from infected pigs. Movement of infected pigs is the most important method of spread.

Pigs with acute disease shed virus in high concentrations in all secretions and excretions. Transmission readily occurs by direct contact between pigs. ASF is not transmitted in the air from one piggery to another but it does spread in the air within a piggery.

ASF virus is excreted in faeces, urine and secretions (in decreasing order of importance).

Artificial breeding

The virus is present in semen and can be transferred in this way. However, preliminary evidence shows risk of transmission via embryos is negligible if the embryos are handled correctly between collection and transfer (see the **Artificial Breeding Centres Enterprise Manual**).

Animal products and by-products

The ingestion of pigmeat or pigmeat products infected with the virus is an important method of spread, especially in the first outbreak in a country. The first cases of ASF in Malta, Brazil and Sardinia were in swill-fed pigs close to international air or sea ports. In Australia, the unlicensed feeding of swill (food scraps containing material of placental mammal origin) is illegal.

Pigs that survive the acute disease or are infected by mild virus strains usually become chronically infected for at least several months. However, virus is not readily isolated from excretions of such pigs after three weeks post-infection and their role in the spread of the disease is unclear.

Fomites

Transfer by fomites is a proven method of spread of ASF. People, especially veterinarians, veterinary instruments (especially hypodermic needles), vehicles that have carried infected pigs, and flies have all been implicated.

Vectors

The epidemiology of ASF in Africa is quite different from that seen in most parts of Europe and Southern and Central America. In Africa, the soft argasid tick (*Ornithodorus moubata porcinus*) maintains ASF virus in the warthog population and is found in their

burrows. The only Ornithodorus tick present in Australia is the inornate kangaroo tick (*O. gurneyi*). However, blood-sucking insects such as mosquitoes feeding on viraemic pigs have been implicated in the spread of ASF within herds (see Section 2.2.11).

1.6.4 Factors influencing transmission

Pigs that have recovered from ASF may carry virus for up to 12 months. Virus has been isolated from the blood of clinically normal pigs for 8 weeks and from lymphoid tissue for at least 12 months post-infection. Pregnancy does not appear to cause reactivation of virus excretion.

Carcases of pigs that die during the acute phase of ASF will contain more virus, and therefore are more infective to other pigs, than carcases of chronic carriers of ASF that may pass antemortem and postmortem examinations at abattoirs. Carcases of chronic carriers have, however, been linked to the spread of ASF.

1.7 Manner and risk of introduction

Possible methods of introduction of ASF virus into Australia include illegally imported pig meats and other pig products, garbage from international aircraft and ships, biological products and illegally imported pigs and boar semen. This last method is unlikely in view of Australia's quarantine procedures.

Feral pigs would be an important reservoir if they became infected.

2 PRINCIPLES OF CONTROL AND ERADICATION

2.1 Introduction

The elements of a control and eradication program are:

- early recognition and laboratory confirmation of the disease (see Section 1.4);
- early identification of infected and potentially-infected premises including piggeries, saleyards, meatworks and cold stores (see Section 2.2.1 and Appendix 1);
- rapid imposition of effective quarantine on infected and potentially-infected premises (see Section 2.2.1);
- rapid destruction and sanitary disposal of carcases and fomites and disinfection (see Section 2.2.5, 2.2.7 and 2.2.8);
- the swift declaration and effective policing of control areas to prevent movements of pigs and pig products carrying, or potentially carrying, ASF virus (see Appendixes 1 and 2).
- the rapid elimination of feral pig hosts (see Section 2.2.10).

2.2 Methods to prevent spread and eliminate pathogens

2.2.1 Quarantine and movement control

ASF can spread rapidly and can be carried over long distances by transport of infective materials. Strict movement control on anything that may have become contaminated with virus and the immediate imposition of tightly controlled quarantine on all premises suspected of being infected is therefore essential to a successful eradication program. Quarantine should be imposed on all farms on which infection is either known or suspected and should be strictly policed to ensure that no one, including the farm residents, owners, their friends and farm workers, leave without changing clothes and footwear. Particular attention needs to be paid to workers who keep their own pigs.

For effective quarantine of an *infected premises* (IP) or *dangerous contact premises* (DCP) security should be maintained around the clock to ensure that only authorised personnel, in protective clothing, are allowed to enter. Movements of residents onto and off the property should be supervised and limited.

For further information on declared areas, quarantine and movement controls, see Appendixes 1 and 2.

Infected premises or dangerous contact premises

Quarantine of an IP prevents spread of the disease by prohibiting movement of pigs, products and materials to or from the premises. It is important to apply quarantine measures as early as possible to slow the rate of spread in an area. Quarantine measures should be applied immediately wherever there is any suspicion of infection. It may well take several weeks before there can be any confidence that no other properties in the area are incubating the disease and during this time the strictest quarantine measures must be maintained. Consideration must be given to arranging the destruction of pigs on DCPs because this affords an opportunity to dispose of exposed pigs before they develop clinical disease and begin to excrete infective virus.

Restricted areas and control areas

The declaration of a *restricted area* (RA), which should include the IPs and generally some or all of the DCPs and suspect premises (SPs), assists in preventing spread by restricting movement onto and off the premises that are most likely to have had direct or indirect contact with the IPs. The RA does not need to be circular but can have an irregular perimeter, provided the boundary initially declared is an appropriate distance from the nearest IP. The European Union (EU) specifies a 3 km radius. The boundary will be fixed taking into account the distribution of pigs and traffic patterns to markets, service areas, abattoirs and areas that constitute natural barriers to movement (such as large rivers and mountain ranges).

The declaration of a *control area* (CA) also helps to control the spread of the outbreak from within the RA. The CA is a buffer zone between the RA and the rest of the industry. The boundary again does not have to be circular. The EU specifies 10 km from the boundary of the RA. Movement of potentially contaminated materials within a CA is allowed but movement out of the CA should be prohibited without prior approval of the relevant CVO. If the CA contains an appropriate premises for slaughtering pigs, permission should be granted for pigs to be removed for supervised slaughter for human consumption from quarantined farms where no sign of infection has developed in the 20 days after the event that placed that property in quarantine. This represents a minimum risk of infected pigs being removed, a risk that is further reduced by the cooking processes involved in the human food chain.

Different movement controls can be applied to piggeries of different status, such as: total prohibition of movement; or permitting movement of pigs direct to slaughter, or to another property, after inspection and/or serological monitoring of the herd.

Interstate movement controls (and possibly even intrastate) on pig products may be imposed. It is desirable to minimise such controls because they cause a large part of the economic loss suffered by the industry during an exotic disease outbreak. It is very probable that interstate commerce involving some pig products from a State with infection could be continued with no danger of disease transmission.

Zoning

Once the extent of the outbreak has been defined, consideration should be given to declaring a major part of Australia free from the disease. The free area should be based on geographic boundaries and should comply with OIE requirements (see Appendix 3) or as determined by international clients.

2.2.2 Tracing

The index case(s) should be identified as soon as possible, together with the likely date of initial infection and how far infection has spread.

Identification of the index case is obtained by investigating the movements of pigs, people and other modes of transmission to and from the known infected premises (IPs).

The date of entry of disease into each IP should be determined to assist trace-back and trace-forward investigations.

Detailed tracings of the movement of pigs, pig products and wastes to and from IPs and DCPs is a foremost priority at the very beginning of an outbreak of ASF.

As the incubation period can be up to 20 days, trace-back procedures should apply to all movements that took place during the 20 days before the first clinical signs. The trace-back period may be extended on the basis of disease investigation, history or serology.

Trace-back and trace-forward investigations may involve clinical examination of live pigs, postmortem examinations, serology and recording histories.

Other activities to determine the extent of infection include retrospective examinations of abattoir records for high condemnation rates for fever and retrospective examinations of samples submitted to laboratories from outbreaks of disease that could have been ASF.

2.2.3 Surveillance

Intensive surveillance involving clinical examinations, autopsies, serology and owner reporting should be undertaken on all suspect premises (SPs) (see Appendix 1) and DCPs. Surveillance should be maintained, and the premises retain their SP status for 40 days (the OIE the maximum incubation period) after the last date of possible transmission.

Swill feeding is a major mode of transmission. There should be an intensification of surveillance of the swill feeding ban during an outbreak and for a protracted period after the last case.

2.2.4 Treatment of infected animals

The treatment of infected animals is not effective.

2.2.5 Destruction

On IPs all pigs should be destroyed. On DCPs the following pigs should be destroyed:

- pigs originating from an IP;
- pigs coming into contact with the faeces, urine and/or secretions of pigs moved from an IP;
- pigs injected with hypodermic needles previously used on an IP;
- pigs that have been handled by personnel immediately after handling pigs from the IP; and
- all pigs if more than 66% of pigs are to be destroyed on the basis of the above guidelines (this guideline should not necessarily be followed for very large units with > 500 sows).

Efficient, humane procedures must be employed to kill pigs, without moving them from the site (see **Destruction of Animals Manual, Section 4.3**).

If ASF develops in pigs on a DCP or an SP this does not greatly increase the chances of further spread of disease, provided strict quarantine has been maintained (that is, no movements of pigs, contaminated persons or materials).

2.2.6 Treatment of animal products and by-products

ASF virus is resistant to the pH changes which accompany rigor mortis, and it is not inactivated by freezing and thawing. The virus is relatively resistant to the pH changes that occur during the lactic acid curing of certain dried and smoked meat products. Uncooked products prepared by curing and smoking, such as salami, pepperoni and salchicon, which contain infectious virus immediately after manufacture, may be free of virus after a four month curing period.

Brining alone is insufficient to inactivate ASF virus in hams. However, cooked or canned hams are safe, as long as they have been heated throughout to 70°C. Although not cooked, Parma ham is rendered free of ASF due to its 12 month curing process.

ASF virus is inactivated in liquid media by heating at 60°C for 30 minutes. Such heat treatment could be sufficient to render safe soups, broths and meat extracts, however such a heat treatment would have no margin of error and would be very risky (MacDiarmid 1991).

2.2.7 Disposal

One of the major objectives of the eradication program is prompt and effective disposal of infective material. Available methods include burial, cremation and rendering. The disposal of very large numbers of pigs in a short time presents environmental and logistical problems (see **Disposal Procedures Manual, Sections 3.1, 3.2 and 3.5**).

All pigs dying on uninfected piggeries within the control area or possibly further afield, should be disposed of immediately in a way that prevents them from being cannibalised by feral pigs or moved away from the disposal site. Disposal will normally be by burial or burning.

2.2.8 Decontamination

Decontamination entails cleaning and disinfection of the infected site to remove all infective material. The cleaning of organic matter from sheds, equipment, vehicles, etc is the most important step before disinfection. Particular attention should be paid to the decontamination of electrical equipment. Equipment and fixtures, especially valuable electrical equipment, should be dismantled, and hand washed and disinfected, rather than cleaned and disinfected *in situ* by use of high pressure water or steam hoses.

Decontamination of the yards and surroundings of IPs, burial or burning grounds as well as the decontamination of rendering plants must be instituted as soon as possible. Best disinfectants are detergents, hypochlorites, alkalis, Virkon and glutaraldehyde. For the type, dose, method and application of disinfectants see the **Decontamination Manual, Tables 2.2, 3.2 and 4.**

2.2.9 Vaccination

There is no vaccine for ASF.

2.2.10 Wild animal control

If ASF were to be established in the feral pig population it would be very much more difficult, if not impossible, to eradicate. Accordingly, the strategy should be to minimise contact between feral pigs and domestic pigs. Methods to achieve this include:

- preventing feral pigs coming in contact with domestic pigs by fencing the piggery;
- eliminating or reducing the numbers of feral pigs in areas where domestic pigs are held, especially in the RA and CA; and
- immediately burning or burying carcases on pig farms to prevent their consumption by feral pigs.

For further information see the **Wild Animal Control Manual (in press)**.

2.2.11 Vector control

Blood-sucking insects such as mosquitoes feeding on viraemic pigs and then on uninfected pigs have been implicated in the mechanical spread of ASF within herds. An insect control program should be carried out on all IPs and DCPs. Entomologists and private pest control companies should be consulted and employed.

2.2.12 Sentinel animals and restocking

Properties that have been depopulated and decontaminated should initially be restocked with only a small percentage of the normal capacity of the piggery. These pigs will act as sentinel animals and subject to surveillance to evaluate the efficacy of the decontamination procedure.

Sentinel animals should not be introduced to a piggery until six weeks after the completion of decontamination.

2.2.13 Public awareness

A media campaign must emphasise the importance of farmers inspecting susceptible animals regularly and of reporting suspicious lesions and unusual deaths promptly. The public must not be panicked into avoiding meat products. The ban on swill feeding should be reinforced as well as the need to avoid contact between domestic and feral pigs.

2.3 Feasibility of control in Australia

Eradication of ASF is extremely difficult and involves considerable resources. In major outbreaks of the disease, eradication has only been achieved by total national depopulation of pigs. If feral pig populations in Australia became infected then eradication may be impossible.

3 POLICY AND RATIONALE

3.1 Overall policy for African swine fever

African swine fever (ASF) is an OIE List A disease that has the potential for rapid spread and which is important to the trade in pigs and pig products.

The policy is to eradicate ASF in the shortest possible period, while limiting economic impact, using a combination of strategies including:

- ***stamping out,* which involves quarantine, slaughter of all infected and exposed susceptible animals and sanitary disposal of destroyed animals and contaminated animal products, to remove the source of infection;**
- ***quarantine and movement controls* on animals, animal products and things in declared areas to prevent spread of infection;**
- ***decontamination* of facilities, products and things to eliminate the virus on infected premises and to prevent spread in declared areas;**
- ***tracing and surveillance* to determine the source and extent of infection and to provide proof of freedom from the disease;**
- ***zoning* to define infected and disease-free areas; and**
- ***a public awareness campaign* to facilitate cooperation from industry and the community.**

An uncontrolled outbreak of ASF would cause severe production losses with consequent dislocation and financial losses in the pig industry and associated service and sales industries. It will therefore be necessary to act immediately and effectively to control and then eradicate the disease.

ASF is included in the Commonwealth/States cost-sharing agreement.

The CVO(s) in the State(s)/Territory(s) in which the outbreak(s) occurs will be responsible for implementing disease control measures (in accordance with relevant legislation), and will make ongoing decisions on follow-up disease control measures in consultation with the Consultative Committee on Exotic Animal Diseases (CCEAD), the State/Territory and Commonwealth governments, and representatives of the affected industries. The detailed control measures adopted will be determined using the principles of control and eradication (Section 2) along with epidemiological information about the outbreak. For further information on the responsibilities of the State/Territory disease control headquarters and local disease control centre(s), see the **Control Centres Management Manual**.

3.2 Strategy for control and eradication

The strategy is to eliminate the disease in the Australian pig industry as quickly as possible. This can best be accomplished by the ready application of a stamping-out strategy on infected premises and the imposition of quarantine and decontamination on infected, dangerous contact and suspect premises. Additional strategies such as tracing and surveillance to determine the infected and free premises and declared areas, and for the control of feral pigs, will be required as necessary.

The results of tracing and the extent of infection will play a major role in determining the strategy to be pursued. An objective of the preferred strategy for control is to minimise the disruption caused to the marketing of pigs and pigmeats on the domestic market and to allow the modest export trade to recommence as soon as possible.

An uncontrolled outbreak of ASF would cause severe production losses with consequent dislocation and financial losses in the pig industry and associated service and sales industries. It will therefore be necessary to act immediately and effectively to control and then eradicate the disease.

3.2.1 Stamping out

The stamping-out strategy is preferred because international experience has shown it to be effective and benefit–cost analyses have shown it to be justified. However, eradication can only be achieved if resources are available to eliminate infected pigs as fast or faster than the disease is spreading. This strategy also permits a more rapid declaration of freedom from ASF under the OIE Code (see Appendix 3).

In the first instance stamping out will be directed to IPs and specific animals on DCPs. Any further slaughter out will be done on the basis of tracing and surveillance information, the controls in place and the likelihood of spread from suspect properties.

The ASF virus is very hardy and able to survive for long periods outside of the host so it is important that the major source of virus be eliminated quickly.

3.2.2 Quarantine and movement controls

Infected, dangerous contact and suspect premises (SPs) will be declared. DCPs are those that contain pigs that have originated from an IP or pigs that have been in contact with pigs, people equipment, vehicles or products that have had contact with an IP. SPs are those that contain pigs that have possibly had contact with pigs or items from an IP or DCP.

It is important that quarantine and movement controls be imposed on DCPs and any SPs as soon as the disease is suspected. Movement controls both into and out of the premises will apply to all animals, people, products and fomites. The virus is not transmitted from farm to farm by wind and the prevention of movement of suspicious animals, people and materials will contain the disease. A tick vector is involved in transmitting the disease in some other countries and mosquitoes have also been implicated in mechanically transferring the virus between pigs.

A restricted area (RA) will be declared around the IP and will include the DCPs and as many of the SPs as is possible. The RA should be an area of about 3 km radius around the IPs.

The control area (CA) should form a buffer between the infected and free areas and its boundary should be at least 10 km outside of the RA boundary to satisfy international requirements. The OIE generic requirements are for a distance of at least 10 km between the infected and free areas.

Product from infected premises must be destroyed and disposed of in a safe manner, preferably by burial on the IP.

Movement into and out of the RA will be strictly controlled while movements within the CA will be less restrictive but still subject to permit.

For further details on declared areas and movement controls see Appendixes 1 and 2.

Zoning

Zoning should be implemented, if possible, to enable the international trade to resume as soon as possible and for the development of the trade to continue. International guidelines should be used to ensure they meet the expectations of trading partners. A minimum distance of 10 km between the IP and the free area is necessary.

3.2.3 Treatment of infected animals

Treatment of infected animals is ineffective.

3.2.4 Treatment of animal products and by-products

It may be possible to heat treat product from non-clinically infected animals to ensure its safety. The evidence, however, is that carcases, products and fomites are serious sources of virus and this makes the movement for processing of live animals and vehicles from infected and suspect sources a dangerous practice and one likely to lead to further spread of the virus.

Products from infected sources should be destroyed on the premises, where possible, and only moved to other areas for disposal as a last resort and only following disinfection, good hygiene and tight security.

Products from suspect premises, including DCPs, may be used for further processing under supervision after a period corresponding to the incubation period has elapsed and the source premises have been assessed and monitored with satisfactory results.

3.2.5 Vaccination

There is no vaccine available.

3.2.6 Tracing and surveillance

Tracing should extend back for at least 20 days, the normal maximum incubation period, but in order to comply with OIE guidelines (see Section 1.6.1), this may need to be extended to 40 days before the first signs of clinical disease on the IP and up to the time that effective quarantine has been imposed on the IP. Tracing will involve an extensive investigation of movements of animals, people, vehicles, equipment and products over this period. Such investigations must involve an examination of herd records and records from abattoirs and laboratories where animals have been subjected to examination.

Surveillance must include serology, farm examinations and follow-up on reported cases of disease and this must be supported by laboratory investigation.

The surveillance should enable the RA and CA boundaries to be established and to identify any further suspicious premises.

Sentinel animals may be introduced to the depopulated premises 6 weeks after the last case and when decontamination has been completed. Surveillance of these animals must be undertaken for a period of at least 6 weeks and will include serology and clinical examinations.

Surveillance will also be necessary after the disease has been eradicated and the IPs and DCPs are repopulated. This will involve surveillance in the RA, CA and the free areas and will need to include the feral pig populations within the vicinity of the RA.

3.2.7 Decontamination

Due to the tenacity of the virus in a wide range of conditions in the environment, particularly in carcases, pig products and on fomites, it is necessary to ensure that decontamination is performed thoroughly on everything, including people, that may have come into contact with infected or suspect animals. Where decontamination cannot be effectively undertaken the item must be disposed of in a safe manner.

Decontamination should also include treatment for mosquitoes and tick vectors.

3.2.8 Wild animal control

Feral pigs would be very susceptible to ASF infection and any feral pigs in the area should be identified and destroyed if considered necessary. Whatever other actions are taken, it is necessary to ensure that ASF infected animals are not able to come in contact with any feral animals in the vicinity and that feral pigs are unable to gain access to carcases.

3.2.9 Media and public relations

If the disease is present in its most severe form it will result in high morbidity and mortalities. It is important, therefore, to liaise closely with industry, the media and the public to attempt to ensure all parties are fully aware of the consequences of the disease and reassure the public that it is not at risk. The methods of control require quick and ruthless stamping out and the agreed strategies need to be carefully explained to attempt to maintain public confidence in the product. Sensationalised reporting of the possible destruction of animals will have a powerful detrimental impact on the public reaction to the product.

3.3 Social and economic effects

Losses caused by ASF include mortalities, which can be very high, and loss of income from reduction of meat production and increased feed costs. An uncontrolled outbreak in Australia would result in severe losses and unemployment at the farm, processor and retail levels. Prices of other animal products might rise. If eradication can be undertaken quickly and effectively there may be no lasting damage to the pig industry provided it could recover its market share.

If ASF were to occur in Australia and no compulsory control measures were to be taken by government authorities, the disease could spread rapidly throughout the pig industry. Many piggery owners would impose some of the control strategies outlined in this document to their own piggeries and escape the infection. Without any government control it is not unreasonable to suggest ASF could spread, in one year, to piggeries holding 5–15% of the nation's pigs. If there were a 50% mortality rate, high abortion rate and chronic ill thrift in those pigs that survive, the annual output of these units would decrease by an estimated 80%.

Based on 1994 Australian Bureau of Agriculture and Resource Economics (ABARE) figures this represents a loss of up to $81.7 million in the first year of the disease. Thereafter the disease could become progressively more widespread and expensive, however the loss of production in infected piggeries would decrease.

Those producers whose pigs escaped infection might attract a premium price for their produce but they might not benefit from the misfortunes of other producers. In Belgium, pigmeat consumption fell by 25% during the 1985 outbreak despite assurances that it was perfectly safe for human consumption.

The above estimates of loss include only the value of products at the farm gate. The cost of losses in the ancillary processing, marketing and transport industries are not included.

Almost inevitably the small, but significant, export trade in pigs and pig products (value in 1993/4 $28.26 million) would cease if Australia were infected with ASF.

Prolonged loss of income for producers whose herds are destroyed and subjected to quarantine controls will be substantial; there will be reduced market opportunities and changed management practices will change.

The stamping-out strategy may cause the destruction of some genetically important herds even though special efforts would be taken by their owners to protect them.

Social effects, other than those related to economics, would be slight. There would be very few restrictions on the movement of people but changes would be made to the marketing and transportation of pigs.

3.4 Criteria for proof of freedom

The OIE Code (Appendix 3) states that ‘A country shall be considered as free of ASF when it can be established that this disease has not been present in it for at least the past three years. This period shall be 12 months for countries in which a stamping-out policy is practised and it can be demonstrated that the disease is not present in the domestic or wild populations’.

If stamping out is not practised, the country will be considered infected for three years after the last case and following evidence that the disease is not present in the domestic or wild populations.

A serological survey should be undertaken, based on sound epidemiological principles. Sera should be collected from all IPs and DCPs after repopulation and from all piggeries that were in a RA. High risk herds should be specifically targeted for sampling. These are herds where pig abattoir workers and pig transport drivers work and herds that buy weaners or stores at saleyards. A lower intensity of testing should apply in non-affected areas and in States where the disease did not occur.

Any serological survey must include feral animal populations in the RA and its surrounds.

3.5 Funding and compensation

African swine fever is included in the list of diseases for which arrangements exist under the Commonwealth/States cost-sharing agreement for the eradication of certain exotic animal diseases. Information on the cost-sharing arrangements can be found in the AUSVETPLAN **Summary Document** and in the **Valuation and Compensation Manual.**

3.6 Strategy if the disease becomes established

If eradication is considered to have become impracticable, the long-term control of the disease will be determined following consultation between the government and the pig industry. An epidemiological investigation would be needed to establish why ASF had become established before decisions could be made on changes to the strategy.

If the disease becomes established because of a delay in initial diagnosis leading to widespread infection in both domestic and feral pigs, then possible strategies will still be directed to eradication either in the short or long term. In either case intensified measures to control feral pig numbers and restrict the movement of domestic pigs would be appropriate.

If the disease becomes established because of swill feeding, extension efforts and policing of the ban would need to be intensified. Prohibiting the feeding of all waste food may be appropriate to eliminate illegal swill feeders who escape detection by appearing to be legal waste vegetable feeders.

Infection in feral pigs will prolong any eradication and producers will need to establish a management system that may involve movement restrictions and control over the treatment of product.

Eradication can only be achieved if infection is stamped out and suspect premises are subjected to continuing quarantine and movement controls combined with strict decontamination procedures.

APPENDIX 1 Guidelines for classifying declared areas

Infected premises (IP)

A premises classified as an IP will be a defined area (which may be all or part of a property) in which an exotic disease or agent exists, or is believed to exist. IPs will be subject to quarantine served by notice. All pigs on IPs will be destroyed.

Dangerous contact premises (DCP)

Premises that contain animals showing no clinical signs of disease but which, by reason of their probable exposure to disease, will be subject to disease control measures.

Premises classified as DCPs will be:

- premises containing pigs originating from an IP or that have shared a common transport arrangement with infected pigs;
- all neighbouring premises on which pigs have been sharing a common fence-line with infected animals on an IP;
- premises containing pigs that have, or have had, contact with the faeces, urine and/or secretions of pigs moved from an IP;
- premises with pigs that have been handled by personnel immediately after handling pigs from the IP;
- premises on which pigs have been injected with hypodermic needles previously used on an IP; and
- all premises where it is considered that disease could possibly have spread to pigs from an IP by way of the movement of people, vehicles, equipment or feedstuff.

Suspect premises (SP)

Premises that contain animals, materials or things suspected of being contaminated by an exotic disease agent.

Premises classified as SPs will be:

- all other premises owned or managed in conjunction with an IP; and
- other neighbouring premises containing pigs.

Restricted area (RA)

A relatively small declared area (compared to a *control area*) around an infected premises that is subject to intense surveillance and movement controls. Movement out of the area will in general be prohibited, while movement into the restricted area would only be by permit. Multiple *restricted areas* may exist within one *control area*.

The RA does not need to be circular but can have an irregular perimeter provided the boundary is approximately 3 km from the nearest IP.

Control area (CA)

A bigger area than a restricted area (possibly initially as big as the State) where restrictions will reduce the chance of the disease spreading further afield. The control area may be reduced in size as the extent of the outbreak becomes clearer but must remain consistent with OIE Codes. In principle, animals and specified product will only be able to be moved out of the control area into the free area by permit.

The boundary does not have to be circular and should be approximately 10 km from the boundary of the RA.

APPENDIX 2 Recommended quarantine and movement controls

Infected and dangerous contact premises (IP and DCP)	**Suspect premises (SP)**
Movement out of pigs: Prohibited.	Prohibited until monitoring changes status of premises.
Movement in of pigs: Prohibited.	Prohibited until monitoring changes status of premises.
Movement out of pig carcases, meat, product, offal, wastes: Prohibited unless under CVO permit.	As for IP/DCP.
Movement in and out of other animals, people, vehicles and equipment: Restricted with detailed decontamination where movement allowed.	As for IP/DCP.
Movement out of pig semen, embryos: Risk assessment undertaken to allow movement or destruction as appropriate.	As for IP/DCP.
Movement out of crops, grains: Allowed with any necessary decontamination.	As for IP/DCP.

Restricted area (RA)	**Control area (CA)**
Movement out of pigs: Allowed for slaughter after monitoring for the length of one incubation period, subject to CVO permit.	Movement for slaughter only subject to CVO permit.
Movement in of pigs: Prohibited.	Restricted initially; allowed subject to CVO permit.
Movement within of pigs Allowed subject to CVO permit.	As for RA.

Movement through of pigs:	
Prohibited.	Movement allowed, subject to CVO permit, only along major thoroughfares and without stopping.
Movement of pig carcases, meat, products, offal, wastes:	
Movement allowed after tracing and surveillance, subject to CVO permit.	As for RA.
Movement out of semen, embryos:	
Movement allowed after tracing and surveillance subject to CVO permit.	As for RA.
Risk enterprises:	
Prohibited until decontamination and tracing are completed.	As for RA.
Sales, shows, etc:	
Prohibited pigs or pig products involved.	As for RA.
Movement in and out of people:	
Program to heighten public awareness.	As for RA.
Vehicles:	
Program to heighten public awareness.	As for RA.

APPENDIX 3 OIE International Animal Health Code for African swine fever

[NB The following text is taken directly from the OIE International Animal Health Code (1992); Chapter 2.1.12. For definitions, Appendixes, etc see the original text. The OIE Codes are amended every year in May. There have been no amendments to the code for ASF in 1993, 1994 or 1995.]

Preamble: For diagnostic tests, reference should be made to the *Manual* (A12) [☞see OIE publications under References].

Article 2.1.12.1.

For the purposes of this *Code*, the *infective period* for African swine fever (ASF) shall be 40 days (under study). Survivors of ASF can be carriers for life and the virus agent can be present in their excretions.

Article 2.1.12.2.

For the purposes of this *Code*:

ASF: *free country*

A country may be considered free from ASF when it has been shown that ASF has not been present for at least the past three years. Any importation of live pigs, *semen*, *embryos*/ova, and animal products of pig origin shall take place in accordance with the provisions of the Articles of this chapter.

This period shall be 12 months for countries previously infected and in which a *stamping-out policy* is practised and it has been demonstrated that the disease is absent from the domestic or wild pig population.

ASF: *free zone*

A zone of a country may be considered free from ASF when the disease is compulsorily notifiable in the whole country and no clinical, serological or epidemiological evidence of ASF has been found in the zone during the past three years in domestic or wild pigs. This period shall be 12 months for a zone previously infected, in which a stamping-out policy is practised and it has been demonstrated that the disease is absent from any domestic or wild pig population.

The free zone must be clearly delineated and the animal health regulations to prevent the movement of domestic or wild pigs into the free zone from an infected country or infected zone published, with notification to the OIE in accordance with Article 1.2.0.4. of Section 1.2. of the Code, and rigorously implemented. Regular inspection and supervision of movement should be made of pigs in the free zone to ensure freedom from ASF.

ASF: *infected zone*

A zone shall be considered as infected for three years after the last *outbreak*. This period shall be 12 months for zones in which a stamping-out policy has been practised and it has been demonstrated that the disease is absent from any domestic or wild pig population.

The boundary between the infected zone and the free zone or free country shall not be limited by national frontiers.

Article 2.1.12.3.

Veterinary Administrations of countries should consider whether there is a risk regarding ASF in accepting importation or transit through their territory, directly or indirectly from other countries of:

1) domestic and wild pigs, particularly of the *Sus, Potamochoerus, Phacochoerus, Hylochoerus* genera;
2) *semen* of domestic and wild pigs;
3) *embryos* and ova of domestic and wild pigs;
4) *fresh meat* of domestic and wild pigs;
5) *meat products* of domestic and wild pigs which have not been processed to ensure the destruction of ASF virus;
6) *products of animal origin* (from pigs) *destined for use in animal feeding* or *for industrial use* which have not been processed to ensure the destruction of ASF virus;
7) *products of animal origin* (from pigs) *destined for pharmaceutical use* which have not been processed to ensure the destruction of ASF virus;
8) *pathological material* and *biological products* (from pigs) which have not been processed to ensure the destruction of ASF virus.

Article 2.1.12.4.

When importing from ASF *free countries* or *free zones* in ASF infected countries, *Veterinary Administrations* should require:

for domestic pigs

the presentation of an *international animal health certificate* attesting that the animals:

1) showed no clinical sign of ASF on the day of shipment;
2) were kept in an ASF free country or free zone since birth.

Article 2.1.12.5.

When importing from ASF *free countries* or *free zones*, *Veterinary Administrations* should require:

for wild pigs

the presentation of an *international animal health certificate* attesting that the animals:

1) showed no clinical sign of ASF on the day of shipment;
2) come from an ASF free country or free zone;

if the country of origin has a common border with a country or zone considered infected with ASF:

3) were kept in a *quarantine station* for the 40 days prior to shipment;
4) were subjected to diagnostic tests for ASF with negative results.

Article 2.1.12.6.

When importing from countries considered infected with ASF, *Veterinary Administrations* should require:

for domestic pigs

the presentation of an *international animal health certificate* attesting that the animals:

1) showed no clinical sign of ASF on the day of shipment;
2) were kept since birth, or for the past 40 days, in an *establishment* where no *case* of ASF was officially reported during that period, and that the establishment of origin is situated in a ASF *free zone*.

   Animals introduced into the above establishment did not originate from a country or zone infected with ASF;

3) were subjected to diagnostic tests for ASF with negative results.

Article 2.1.12.7.

When importing from countries considered infected with ASF, *Veterinary Administrations* should require:

for wild pigs

the presentation of an *international animal health certificate* attesting that the animals:

1) showed no clinical sign of ASF on the day of shipment;
2) were kept for the 40 days prior to shipment in a *quarantine station*, where no *case* of ASF was officially reported during that period; the quarantine station is situated in an ASF *free zone* and the animals which were introduced into that zone originated only from ASF *free countries* or free zones;
3) were subjected to diagnostic tests for ASF with negative results.

Article 2.1.12.8.

When importing from ASF *free zones* in ASF infected countries, *Veterinary Administrations* should require:

for *semen*, *embryos* or ova of pigs

the presentation of an *international animal health certificate* attesting that:

1) the donor animals:
   a) showed no clinical sign of ASF on the day of collection;
   b) were kept in an ASF *free country* or free zone for at least the 40 days prior to collection, and originated only from ASF free countries or free zones;
2) the semen, embryos or ova were collected, processed and stored strictly in accordance with Appendices 4.2.2.1. and 4.2.3.2. respectively.

Article 2.1.12.9.

When importing from countries considered infected with ASF, *Veterinary Administrations* should require:

for *semen* of pigs

the presentation of an *international animal health certificate* attesting that:

1) the donor animals:
   a) showed no clinical sign of ASF on the day of collection;
   b) were kept in the *exporting country*, for the 40 days prior to collection, in an *establishment* or *AI centre* where no *case* of ASF was officially reported during that period, and that the establishment or AI centre is situated in an ASF *free zone*, and that the animals do not originate from a zone infected with ASF;
   c) were subjected to diagnostic tests for ASF with negative results;
2) the semen was collected, processed and stored strictly in accordance with Appendix 4.2.2.1.

Article 2.1.12.10.

When importing from ASF *free zones* in ASF infected countries, *Veterinary Administrations* should require:

for *fresh meat* of pigs

the presentation of an *international sanitary certificate* attesting that the entire consignment of meat comes from animals:

1) which have been kept in a ASF *free country* or free zone since birth;
2) slaughtered in an *abattoir* situated in an ASF free country or free zone and which only receives animals from a free country or free zone;
3) found to be healthy before and after slaughter.

Article 2.1.12.11.

When importing from ASF *free zones* in ASF infected countries, *Veterinary Administrations* should require:

for *meat products* of pigs

the presentation of an *international sanitary certificate* attesting that these products:

1) have been processed from meat complying with provisions referred to in Article 2.1.12.10.;
2) have been processed in meat processing plants situated in an ASF *free country* or free zone, and in which only meat of animals from an ASF free country or free zone is processed.

Article 2.1.12.12.

When importing from countries considered infected with ASF, *Veterinary Administrations* should require:

for *meat products* of pigs

the presentation of an *international sanitary certificate* attesting that the:

1) entire consignment of meat products comes from animals slaughtered in an *abattoir* and found to be healthy before and after slaughter.
2) meat products have been processed to ensure the destruction of ASF virus;
3) necessary precautions were taken after processing to avoid contact of the meat with any source of ASF virus.

Article 2.1.12.13.

When importing from ASF *free zones* in ASF infected countries, *Veterinary Administrations* should require:

for products of animal origin (from pigs) *destined for use in animal feeding or for industrial use*

the presentation of an *international sanitary certificate* attesting that these products come from animals:

1) which have been kept in an ASF *free country* since birth;
2) slaughtered in an *abattoir* situated in an ASF free country or free zone and which only receives animals from an ASF free country or free zone;
3) found to be healthy before and after slaughter.

Article 2.1.12.14.

When importing from *free zones* in ASF infected countries, *Veterinary Administrations* should require:

for *products of animal origin* (from pigs) *destined for pharmaceutical use*

the presentation of an *international sanitary certificate* attesting that these products come from animals:

1) which have been kept in an ASF *free country* since birth;
2) slaughtered in an *abattoir* situated in an ASF free country or free zone and which only receives animals from an ASF free country or free zone;
3) found to be healthy before and after slaughter.

Article 2.1.12.15.

When importing from countries considered infected with ASF, *Veterinary Administrations* should require:

for *products of animal origin* (from pigs) *destined for use in animal feeding or for industrial use*

meal and flour from blood, meat, defatted bones, hooves and claws

the presentation of an *international sanitary certificate* attesting that these products have been processed to ensure the destruction of ASF virus in approved plants, and the necessary precautions were taken after processing to avoid contact of the product with any source of ASF virus;

bristles

the presentation of an international sanitary certificate attesting that these products have been processed to ensure the destruction of ASF virus, in premises controlled and approved by the Veterinary Administration of the *exporting country*, and the necessary precautions were taken after processing to avoid contact of the products with any source of ASF virus.

Article 2.1.12.16.

When importing from countries considered infected with ASF, *Veterinary Administrations* should require:

for *products of animal origin* (from pigs) *destined for pharmaceutical use*

the presentation of an *international sanitary certificate* attesting that:

1) these products:
    a) have been processed to ensure the destruction of ASF virus; or
    b) come from animals which have not been kept in a country or zone infected with ASF;
    c) come from animals slaughtered in an *abattoir* situated in an ASF *free zone*, and found to be healthy before and after slaughter; and
2) that the necessary precautions were taken after processing to avoid contact of the products with any source of ASF virus.

APPENDIX 4 Procedures for proof of freedom

Proof of freedom

OIE Code Article 2.1.12.2. (Appendix 3) states:

A country may be considered free from ASF when it has been shown that:

- ASF has not been present for at least the past three years;
- the period shall be 12 months for countries previously infected and in which a stamping-out policy is practised and it has been demonstrated that the disease is absent from the domestic or wild pig population; and
- any importation of live pigs, semen, embryos/ova, and animal products of pig origin shall take place in accordance with the provisions of the Articles in this chapter.

Procedures for surveillance

In determining an effective but efficient program to prove freedom after an outbreak, the following elements should be considered.

1) The pigs within the restricted, control and free areas should, if possible, be defined into discrete populations for the purposes of surveillance. For example feral pigs located within a State forest would be one population, 'fringe' piggeries may be another, while intensive piggeries would usually be treated as discrete units.
2) The number of properties detected as infected during the outbreak, and the degree of spread this indicates.
3) The estimated time the virus could have been present in the country.
4) The movement of pigs and pig products between pig populations that have been recorded on ANEMIS during the outbreak. Surveillance planning must take into account the incubation period of 11 days, or more likely, the OIE period of 40 days, for classical swine fever. Special attention must be given to examining swill-feeding activities.
5) The accuracy, cost and availability of laboratory tests to examine a large number of animals.
6) The resources available to undertake surveillance testing. Close cooperation between the epidemiologist and resources manager is essential. However, limited resources should not compromise achieving a scientifically acceptable result. For example savings may be accomplished by :
    - collecting material from abattoirs, even though material can only be selected from specific age groups.
    - organising the program over a slightly longer period.

All these factors will influence the statistically acceptable sample size of testing required for Australia to claim freedom from disease. Clearly the pattern and timing of testing will depend on the specific circumstances, but should aim at expanding the free area . Under OIE guidelines however an 'infected zone' will remain until at least 12 months have elapsed after the last case has been reported and following the completion of a stamping-out policy (see Appendix 3).

GLOSSARY

ANEMIS	*AN*imal Health *Em*ergency *I*nformation *S*ystem. A system for the collection, assimilation, actioning and dissemination of essential disease control information using paper documentation and ADP assistance.
Animal products	Meat products and products of animal origin (eg eggs, milk) for human consumption or for use in animal feeding.
Animal by-products	Products of animal origin destined for industrial use, eg raw hides and skins, fur, wool, hair, feathers, hooves, bones, fertiliser.
AUSVETPLAN	A series of documents that describe the Australian response to exotic animal diseases, linking policy, strategies, implementation, coordination and emergency-management plans.
Consultative Committee on Exotic Animal Diseases	A committee of State/Territory CVOs, AAHL and CSIRO, chaired by the CVO of Australia (Cwlth DPIE), to consult in emergencies due to the introduction of an exotic disease of livestock, or serious epizootics of Australian origin.
Control area	A bigger area than a restricted area (possibly as big as a State) where restrictions will reduce the chance of the disease spreading further afield (*see* Appendix 1).
Cyanosis (adj: cyanotic)	Blueness of the skin and/or mucous membranes due to insufficient oxygenation of the blood.
Dangerous contact animal	An animal showing no clinical signs of disease but which, by reason of its probable exposure to disease, will be subjected to disease control measures.
Dangerous contact premises	Premises containing a dangerous contact animal(s) (*see* Appendix 1).
Declared area	A defined tract of land for the time being subject to disease control restrictions under exotic disease legislation. Types of declared areas include *restricted area; control area; infected premises;* and *dangerous contact premises.*
Decontamination	Includes all stages of cleaning and disinfection.
Disinfectant	An agent used to destroy microorganisms outside a living animal.
Disposal	Sanitary removal of animal carcases and things by burial, burning or some other process so as to prevent the spread of disease.
ELISA	Enzyme-linked immunosorbent assay — 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.

Fomites	Inanimate objects (eg boots, clothing, equipment, vehicles, crates, packaging) that carry the exotic agent and spread the disease through mechanical transmission.
Hyperaemia	An increase in the amount of blood in an organ or tissue as a result of dilation of supplying arteries.
Immunodiffusion	A serological test to identify antigens or antibodies by precipitation of antigen–antibody complexes after diffusion through agar gel.
Incubation period	The period which elapses between the introduction of the pathogen into the animal and the occurrence of the first clinical signs of the disease.
Infected premises	A defined area (which may be all or part of a property) in which an exotic disease exists or is believed to exist.
Leucopoenia	A decrease in the number of white cells in the blood.
Local disease control centre	An emergency operations centre responsible for the command and control of field operations in a defined area.
Movement controls	Restrictions placed on movement of animals, people and things to prevent spread of disease.
Petechial haemorrhages	Tiny, flat, red or purple spots in the skin or mucous membrane caused by bleeding from small blood vessels.
Quarantine	Legal restrictions imposed on a place, animal, vehicle or other things limiting movement.
Rendering (of carcases)	Processing by heat to inactivate infective agents. Rendered material may be used in various products depending on particular disease circumstances.
Restricted area	A declared area in which defined rigorous conditions apply to the movement into, out of, and within, of specified animals, persons or things (*see* Appendix 1).
Sentinel animals	Animals of known health status monitored for the purpose of detecting the presence of a specific exotic disease agent.
State/Territory disease control headquarters	The emergency operations centre that directs the disease control operations to be undertaken in that State or Territory.
Surveillance	A systematic examination and testing of animals or things to determine the presence or absence of an exotic disease.
Susceptible species	Animals that can be infected with the disease (for ASF — domestic and feral pigs).
Suspect animal	An animal that is likely to have been exposed to an exotic disease such that its quarantine and intensive surveillance, but not pre-emptive slaughter, are warranted, or, an animal not known to have been exposed to a disease agent but showing clinical signs requiring differential diagnosis.
Suspect premises	A premises containing suspect animals (*see* Appendix 1).

Swill	Food scraps of placental mammal origin that has not been obtained from approved slaughter facilities or treated by an approved process.
Swill feeding	Swill feeding is the feeding of swill to pigs; unlicensed swill feeding is illegal in Australia
Tracing	The process of locating animals, persons or things that may be implicated in the spread of disease.
Vaccine	
– attenuated	A vaccine prepared from infective or 'live' microbes that have lost their virulence but have retained their ability to induce protective immunity.
– 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 life cycle of the agent.
Viraemia	The presence of viruses in the blood.

Abbreviations

AAHL	CSIRO Australian Animal Health Laboratory, Geelong
AI	Artificial insemination
ANEMIS	Animal health emergency information system
ARMCANZ	Agricultural and Resource Management Council of Australia and New Zealand (ARMCANZ)
ASF	African swine fever
CA	Control area
CCEAD	Consultative Committee on Exotic Animal Diseases
CSF	Classical swine fever
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CVO	Chief veterinary officer
DCP	Dangerous contact premises
DNA	Deoxyribonucleic acid
DPIE	Department of Primary Industries and Energy
ELISA	Enzyme-linked immunosorbent assay
IP	Infected premises
OIE	World Organisation for Animal Health [Office International des Epizooties]
RA	Restricted area
RNA	Ribonucleic acid
SP	Suspect premises

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Video/training resources

A pig's tale — why swill feeding is banned (video), AAHL 1993 (available from the Animal Diseases/Incidents Section, DPIE, Canberra; or AAHL)

Exotic diseases of pigs (56 slides), available from the Animal Diseases/Incidents Section, DPIE, Canberra.

[See the **Summary Document** for a full list of training resources.]

OIE publications

OIE Code (1992). *International Animal Health Code* (6th edition), OIE, Paris, France.

OIE Manual (1992). *Manual of Standards for Diagnostic Tests and Vaccines* (2nd edition), OIE, Paris, France.

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