AUSTRALIAN VETERINARY EMERGENCY PLAN

AUSVETPLAN

1996

Disease Strategy

Classical 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 **classical swine fever** (CSF) 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 classical swine fever to Australia. The strategy has been updated and approved by the Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) out-of-session in January 1996.

Classical 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 CSF conform with the **OIE International Animal Health Code 1992** (OIE Code; Appendix 3).

CSF 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

Classical swine fever (CSF) causes 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 African swine fever (ASF) and similar lesions are seen at postmortem examination. The diseases are best distinguished from each other by laboratory tests.

1.1 Aetiology

CSF is caused by an RNA virus of the family Togaviridae, genus *Pestivirus*. Diseases that are endemic in Australia and caused by pestiviruses are border disease of sheep and virus diarrhoea/mucosal disease (BVD/MD) of cattle.

1.2 Susceptible species

Pigs (*Sus scrofa*), both domestic and feral, are the only species susceptible in Australia.

1.3 World distribution and occurrence in Australia

CSF is present throughout Europe with the exception of Ireland, Iceland, Switzerland and the Scandinavian countries. Outbreaks occurred in the United Kingdom in 1986, but it has since been eradicated. It is also present in East and Central Africa, the Indian subcontinent, China, East and Southeast Asia, Mexico and most other countries in Central America, and throughout most of South America.

Outbreaks of CSF occurred in Australia in 1903, 1927–28, 1942–43 and 1960–61. In each case the disease was eradicated. The first three outbreaks were of virulent disease. They resulted from either imported pig meat or food refuse from ships being swill-fed to pigs. The origin of the 1960–61 outbreak is unknown, but probably similar. This outbreak was caused by a strain of low virulence, and only came to official attention as a result of a higher than normal condemnation rate for 'septicaemia' of pig carcases in abattoirs (Geering et al 1995).

1.4 Diagnostic criteria

[For terms not defined in the text see Glossary]

1.4.1 Clinical signs

CSF 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;
- nasal discharge;
- vomiting;
- abortion;
- case fatality rate up to 100%;
- severe leucopoenia;
- incubation period is 2–6 days and most pigs die between 10–20 days.

Subacute form:
- clinical signs as listed under acute form but generally milder and persisting longer (3–4 weeks);
- fever may fluctuate irregularly (>40.5°C);
- case fatality rate lower.

Chronic form (generally pigs surviving the subacute form):
- ill thrift (failure to thrive);
- pneumonia (laboured breathing/coughing);
- loss of appetite, fever, diarrhoea, alopecia and dermatitis;
- 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;
- pin-point haemorrhages occur on the tonsils — tonsils are frequently enlarged and necrotic;
- splenic infarcts;
- haemorrhages can occur in almost any organ — most commonly seen on serosal membranes and in kidneys (as subcapsular petechiae), heart, urinary bladder, lung and gall bladder;
- septal oedema of lungs;
- fluid in body cavities.

Subacute form:
- findings are more variable than for the acute form;
- lymph node and renal haemorrhage;
- lobular consolidation of cranial lung lobes;
- mucosal intestinal haemorrhage.

Chronic form:
- enlarged lymph nodes;

- thymic atrophy;
- fibrinous pericarditis and pleurisy;
- lobular consolidation of lungs — may progress to lobular necrosis and bronchopneumonia;
- poor body condition;
- ulceration of the large intestine—button ulcers, particularly near the ileocaecal valve.

Microscopic lesions (histopathology)

Extensive necrosis of lymphatic tissue is common, particularly in lymph nodes and this may be accompanied by haemorrhage. This is more severe and frequent with acute ASF than acute CSF. The lymphatic necrosis can be characteristically found in the margins of the spleen as 'infarcts', and in the tonsillar crypts as 'pustules'. There is vasculitis, with degeneration of endothelium and fibrinoid degeneration of walls of arteries in all organs. There is usually a pronounced acute inflammation of the brain not involving pus, with the medulla, pons, midbrain and thalamus consistently affected, with prominent mononuclear cell cuffing 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.

Samples should be taken from affected pigs killed immediately before autopsy 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. However, the specimens should be frozen and forwarded with dry ice if the journey is expected to last more than 24 hours (Geering et al 1995). For further information see the **Laboratory Preparedness Manual, Section 6 and Appendix 3**.

Laboratory diagnosis

The tests available at AAHL for diagnosis of CSF are shown in Table 1 and include;

- direct detection of viral antigen in tissue, which is the most rapid diagnostic procedure, antigen can be detected in frozen sections of tonsil, spleen or lymph node;
- isolation and identification of virus in tissues or blood

- pestivirus isolates must be differentiated using techniques such as polymerase chain reaction (PCR) or fluorescent antibody testing with monoclonal antibodies;
- serological tests such as enzyme-linked immunosorbent assay (ELISA) and neutralisation peroxidase linked assay (NPLA).

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

Test	Specimen required	Test detects	Time taken to obtain result
Direct fluorescent antibody test of frozen sections	fresh tissue	antigen	2–3 hours
Capture ELISA	blood	antigen	6–8 hours
Virus isolation and identification	tissue /whole EDTA blood	virus	up to 10 days
Polymerase chain reaction	tissue / whole EDTA blood	viral RNA	3–4 days
ELISA	serum	antibody	24 hours
Neutralisation peroxidase linked assay	serum	antibody	4–5 days

Source: Information supplied 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.

The following diseases must be considered in the differential diagnosis of CSF:

- 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
- African swine fever
- viral encephalomyelitis

1.5 Resistance and immunity

1.5.1 Innate and passive immunity

Some strains of BVD/MD virus give some immunity to CSF virus but it is not known what proportion of Australian pigs have been infected with these viruses. Uninfected pigs are totally susceptible.

Seropositive sows transmit antibodies via the colostrum to their offspring. The passive immunity generally protects piglets against mortality during the first 5 weeks of life, but not against virus replication and shedding (Terpstra 1977).

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 to the immune status of the pig population.

1.5.3 Vaccination

Attenuated ('live') virus vaccines are used by many countries to control CSF. Attenuation has been achieved by passage in rabbits (lapinised) and/or by serial passage in various types of cell cultures. Examples of such attenuated vaccines are the Chinese lapinised strain (CLS), sometimes called the C, K or LPC strain, the Japanese guinea pig cell culture adapted (GPE^-) and Thiveral (the French PK-15 cell adapted) vaccine strains.

These three strains induce protective immunity, and are considered to be stable and suitable for use in pregnant sows and new-born piglets. Consequently they are used in situations in which eradication of the disease is not possible.

However, immunisation is restricted in some countries because it may not be compatible with eradication. Immunised pigs can be infected with virulent CSF virus strains and it is difficult to differentiate vaccine and wild virus (particularly the less acute strains of CSF) except by laboratory methods. Consequently, work is being undertaken to develop recombinant CSF vaccines. The aim is to produce vaccines vectored with genetically changed Aujeszky's disease virus, or swine pox virus. Genes coding for particular proteins of CSF virus are being inserted into the vector, which, if successful, could be used to immunise pigs against both diseases, eg Aujeszky's and CSF. The advantage of such vaccines would be their safety and the ability to readily differentiate immunised and infected animals because immunised animals would have antibody to only certain protective antigens whereas infected pigs would have antibody to other antigens as well.

No vaccines are currently approved for use in Australia.

1.6 Epidemiology

1.6.1 Incubation period

The incubation period is usually 6–11 days. The OIE Code (1992) gives the maximum incubation period, for regulation purposes, as 40 days (see Appendix 3).

1.6.2 Persistence of virus

General properties/environment

CSF virus is stable over a wide pH range, but below pH 4 and above pH 10 its infectivity is quickly lost.

It is heat stable, being inactivated at 60°C for 10 minutes but can survive 7–14 days at 37° C in blood (Geering 1979). However, the effect of heat treatment on CSF virus is influenced by the physical medium in which the virus is heated. Virus in defibrinated blood (of relevance to soups, broths and extracts) is NOT inactivated after 30 minutes at

68°C and requires heating at 66°C for 60 minutes, 68°C for 45 minutes or 69°C for 30 minutes for inactivation. Heating the virus in tissues to 80°C for 60 seconds may also not inactivate it (Van Oirschot 1992, MacDiarmid 1991).

The virus is also sensitive to the action of ultraviolet radiation (Moennig 1988). In pens and dung the virus appears to be inactivated in a few days (Van Oirschot 1992).

The virus has a lipid-containing envelope and is susceptible to a range of disinfectants including detergents and alkalis and it is rapidly inactivated by solvents such as chloroform and ether (see Section 2.2.8).

Live animals

In acute and subclinical infections the virus is shed for a relatively short period, whereas persistently-infected pigs shed virus continually or intermittently (Van Oirschot and Terpstra 1989). Infected pigs may shed the virus during the incubation period. Viral excretion continues until death or, in pigs that survive, until specific antibodies have developed. Pregnant sows exposed to moderate or low virulence strains can pass the virus *in utero*. The piglets born to these 'carrier sow' may shed large quantities of the virus for months without showing signs of disease or developing an immune response (Terpstra 1994).

Animal products

CSF virus can survive in pork and processed pork products. Survival can be prolonged for months when meat is stored cool or even for years when it is stored frozen (Terpstra 1994). The virus is, however, susceptible to rapid changes in temperature such as thawing and refreezing (MacDiarmid 1991).

In salted and brined meat (ham) the virus may survive for 2–4 months (MacDiarmid 1991).

Fomites

The virus has been transmitted by farmers, veterinarians, inseminators and castrators through the use of contaminated instruments. Transmission by contaminated clothing and footwear is believed to be rare since the amount of the virus transferred is usually below the minimum infective dose for pigs (Terpstra 1994).

1.6.3 Modes of transmission

Live animals

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

Pigs incubating the acute form of the disease can shed virus before showing clinical signs. Chronic carriers (pregnant carrier sows and immunotolerant pigs born to carrier sows) are particularly important in the epidemiology of an outbreak as they are clinically normal. In infected herds up to 43% of pregnant sows may be carriers. Breeding stock sales have been important in the spread of CSF overseas. However, there are very few movements of pregnant sows from one farm to another in Australia.

CSF virus is excreted in the highest concentration in oral fluid, with smaller quantities in urine, faeces and nasal and lachrymal fluids. Large quantities of virus may be disseminated when carrier sows farrow.

Artificial breeding

The virus is present in semen and likely to be transmitted. Washing of embryos has no effect in removing the virus attached to the embryo, but virus is removed or inactivated by trypsin treatment. Therefore, there should be no risk when standard International Embryo Transfer Society methods are followed. (See the **Artificial Breeding Centres Enterprise Manual.**)

Animal products and by-products

The ingestion by pigs of pigmeat or pigmeat products infected with the virus is an important method of spread of CSF, especially in the first outbreak in a country. The unlicensed feeding of swill (food scraps containing material of placental mammal origin) is illegal in Australia.

Processed pigmeat products from an European Community country infected with CSF were considered to be the most likely source of CSF virus in the 1986 English outbreak.

Fomites

Vehicles that have carried infected pigs can be a source of infection. Hypodermic needles used on more than one pig or more than one farm are a very important method of spread. CSF can also spread when vaccinating teams do not discard partially used bottles of vaccine when moving from farm to farm. Contaminated clothing and footwear may be significant in the epidemiology of CSF.

Vectors

CSF virus is not transmitted biologically by any insect/arthropod vectors but the virus may be spread mechanically by pets, birds and arthropods. Three species of Muscidae (house flies), two Tabanidae (stable flies) and the mosquito *Aedes aegypti* have been shown to be capable of transmitting CSF mechanically.

1.6.4 Factors influencing transmission

Latent infection

Pigs infected with virulent strains of CSF generally shed virus in large quantities for a short period of time until they die or become immune. Some pigs with chronic disease are viraemic for longer. Sows infected with low virulence strains of CSF may infect their progeny *in utero* for several gestations. Some of their progeny can be immunotolerant and excrete virus for 153 days or longer.

1.7 Manner and risk of introduction

Pigmeat products, introduced legally or illegally, and ship's garbage are believed to have been the source of most of the incursions of CSF into Australia. Introduction of pig products from endemic countries is still the greatest risk. Entry could be by smuggled meat products through airports or the mail, or garbage from ships, aircraft, yachts, etc. Fishing vessels from some Asian countries may constitute a risk.

Feral pigs in contact with rubbish tips and food refuse from ships, on beaches and so on, may pose a risk especially if contact or mating with domestic pigs occurs.

2 PRINCIPLES OF CONTROL AND ERADICATION

2.1 Introduction

The elements of a control and eradication program for CSF 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 2.2.2 and Appendix 1);
- rapid imposition of effective quarantine on infected and potentially infected premises (see Section 2.2.1);
- their elimination as a source of infection by the rapid destruction and sanitary disposal of carcases and fomites, and disinfection (see Sections 2.2.5, 2.2.7 and 2.2.8);
- the swift designation and effective policing of control areas to prevent movements of pigs and pig products carrying virus, or potentially carrying virus (see Appendixes 1 and 2); and
- vaccination (not currently available for use in Australia).

2.2 Methods to prevent spread and eliminate pathogens

2.2.1 Quarantine and movement control

CSF can spread rapidly and can be carried over long distances by transport of infective materials. Therefore 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 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 owners, their friends and staff, 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 and all pets should be confined.

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

Quarantine of 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 in this time the strictest quarantine measures must be maintained. Consideration must be given to arranging the destruction of pigs on DCPs because this provides an opportunity to destroy exposed herds and 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 IP(s) 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 is initially 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 a 10 km from the boundary of the RA. Movement of potentially contaminated materials within a CA is permitted 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 11 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 the total prohibition of movement or permitting the movement of pigs direct to slaughter, or to another property, after inspection and/or serological monitoring of the herd.

Interstate (and possibly even intrastate) movement controls 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 carried on 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 the extent of spread of infection.

Identification of the index case is obtained by investigating the times of movements of pigs, people and other modes of transmission (see Section 1.6.3) to and from the known 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 beginning of an outbreak of CSF. As the incubation period is usually less than 11 days, trace-back procedures should apply to all movements that took place during the 11 days before the first appearance of 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 history taking.

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 CSF.

As the ban on swill feeding is important to prevent the spread of disease, any suspected illegal swill feeding should be rigorously investigated.

2.2.3 Surveillance

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

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

2.2.4 Treatment of infected animals

Treatment of infected animals is not effective.

2.2.5 Destruction of animals

On IPs all pigs should be destroyed, and on DCPs the following should be destroyed:

- pigs originating from an IP;
- pigs having access to 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;
- *all* pigs on a DCP should be destroyed 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 > 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**). Owners of pigs and property destroyed will be compensated (see Section 3.5).

2.2.6 Treatment of animal products and by-products

It appears that certain smoked, lactic-cured products such as salami, Parma hams and other products heated to an internal temperature of 70°C should be considered as presenting no risk as vehicles for CSF (MacDiarmid, 1991) (see Section 1.6.2).

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 scavenged by feral pigs or moved away from the disposal site. Disposal will normally be by burial or burning.

2.2.8 Decontamination

Comprehensive cleaning and disinfection may not be necessary for CSF. 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.

The virus is susceptible to a range of disinfectants including detergents (see Section 1.6.2) and the recommended disinfectants include sodium hypochlorite (2.3% available chlorine), alkali wash and 4% lysol (Geering 1979). Sodium hydroxide (2%) is considered most suitable for disinfecting premises contaminated with the virus (Van Oirschot 1992).

Yards and surroundings of IPs, burial or burning grounds, and rendering plants must all be decontaminated as soon as possible. For the type, dose, method and application of disinfectants see the **Decontamination Manual, Tables 2, 4 and 5.**

2.2.9 Vaccination

Although CSF vaccines have been used overseas (see Section 1.5.3) no vaccines are currently approved for use in Australia.

The available vaccines provide protection against clinical disease but do not prevent infection with virulent virus and, therefore, pose problems during surveillance due to difficulty in differentiating between wild and vaccine infections.

2.2.10 Wild animal control

If CSF 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**.

CSF virus is less resistant in the environment than ASF and there is no evidence of vector involvement in its maintenance. Both these factors may decrease the likelihood of CSF spread in feral pigs in low density situations.

2.2.11 Vector control

As insects have been implicated in mechanically spreading CSF, an insect control program should be carried out on all IPs and DCPs. Entomologists and private pest control companies should be consulted and used.

2.2.12 Sentinel and restocking measures

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 be sentinel animals and subject to surveillance to evaluate the efficacy of the decontamination procedure.

Sentinel animals should not be introduced to a piggery until three 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 prevent contact between domestic and feral pigs.

2.3 Feasibility of control in Australia

If a low virulence strain of CSF were found to be widespread in Australia careful consideration would need to be given to formulating an appropriate control program. This could include voluntary accreditation of CSF-free herds and active dissemination of control information to the industry.

CSF has been eradicated from Australia previously by traditional stamping-out procedures of slaughter, disinfection, quarantine and movement controls. It is however considered that CSF would be very difficult to eradicate and would require very considerable resources. It may be impossible to eradicate in some circumstances, for example if there was feral animal involvement (AAHL 1990).

3 POLICY AND RATIONALE

3.1 Overall policy for classical swine fever

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

The policy is to eradicate CSF 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**
- ***an awareness campaign*** **to facilitate cooperation from industry and the community;**

Vaccination is unlikely to be used, but may be approved in exceptional circumstances if stamping out is failing to control the spread of infection.

An uncontrolled outbreak of virulent CSF 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.

There are low virulence strains of CSF that cause negligible production loss. If such a strain were to be identified in Australia, a modified policy may be applied.

CSF 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 strategies selected will be to eradicate the disease and to re-establish the CSF-free status of Australia as quickly as possible. Stamping out in association with strict movement controls, detailed decontamination and tracing and surveillance will be the main strategies.

Vaccination may be used in the event that the disease becomes widespread and the resources available are inadequate to contain the rate of spread.

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. In order to determine whether the selected eradication strategies need to be modified, it should be determined if CSF is present in other parts of the country from where the disease was first diagnosed. **Regardless of any modified approach, stamping out will be undertaken on identified infected premises**.

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 justifiable. However, eradication can only be achieved if resources are available to eliminate infected pigs as fast as, or faster than, the disease is spreading. This strategy also permits a more rapid declaration of freedom from CSF under the OIE Code.

Stamping out will be undertaken on all IPs and selected animals on DCPs. This may involve all animals on a DCP depending on the level of contact and possible risks of spread of disease.

3.2.2 Quarantine and movement controls

Restricted and control areas will be declared in line with good disease control measures and internationally agreed guidelines. The RA should be an area with its boundaries at a radius of approximately 3 km from the infected premises. The CA should have its boundary at least 10 km outside of the RA in order to ensure a satisfactory buffer zone exists between the infected and free areas. As many of the suspect premises will be included in the RA, with the IPs and DCPs, as possible.

IPs, DCPs and SPs will be identified and declared as they are detected. Strict quarantine and movement controls will be imposed in the RA on IPs, DCPs and SPs, and movements in and out of the area will be restricted.

Movement of live animals, products and things from DCPs and SPs will be prohibited. Animals and product on IPs will be destroyed. Product on DCPs and SPs may be destroyed or may be retained for a period of at least 11 days (corresponding to the incubation period; see Section 1.6.1) and released for further heat processing following negative monitoring.

Animals from free properties and some SPs in the RA may be permitted to move to slaughter under supervision and the product subjected to further heat treatment. Movement controls in the CA will not be as restrictive but will be subject to permit. It would be preferable to have a processing plant in the CA to process animals from within the CA as well as those permitted for slaughter from the RA.

Zoning

Zoning should be introduced after the control measures are showing the disease is being contained and the limits of infection have been positively identified. The infected zone should be large enough to enable the inclusion of facilities for processing and marketing animals and products and should meet OIE guidelines.

3.2.3 Treatment of infected animals

Treatment of infected animals is not effective.

3.2.4 Treatment of animal products

The virus of CSF is susceptible to heat and products may be made safe following heat treatment, (see Sections 1.6.2 and 2.2.6) but contamination during transport and processing increases the risk of spread of virus from non-clinically infected animals. This risk is not considered to be warranted and these animals will not be permitted for processing.

Products from pigs from DCPs and SPs may be heat processed after the incubation period has passed and the herd has been subjected to negative monitoring.

3.2.5 Vaccination

A vaccine is available overseas but is unlikely to be used in Australia except in exceptional circumstances such as if the disease becomes widespread and the selected strategies are not able to cope in containing and eradicating the disease.

The available vaccines pose problems during surveillance due to difficulty in differentiating between wild and vaccine infections (see Sections 1.5.3 and 2.2.9). In the unlikely event that vaccine is approved for use, all vaccinated pigs must be permanently identified as they may need to be destroyed.

3.2.6 Tracing and surveillance

Tracing must go back at least the normal maximum incubation period of 11 days from the first signs of clinical disease but this period may need to be extended to 40 days in line with the OIE maximum incubation period (see Section 1.6.1) and should include all movements up to the time quarantine is imposed. Tracing should also include checking of abattoir and veterinary laboratory records. Live animals, products, people, vehicles and all items need to be traced if they have been in contact with the IP, or items from the IP, during the tracing period.

Tracing and surveillance will identify the DCPs and SPs and show the extent of infection so that an appropriate RA and CA can be declared. Surveillance will include serological testing, examination of farm records and examinations of sick and dead animals particularly on DCPs and SPs and other properties in the RA.

After eradication has been completed surveillance will be required to provide proof of freedom (see Appendix 4).

3.2.7 Decontamination

Decontamination is a most important strategy in controlling CSF because of the spread of this virus via fomites and its persistence in meat products. There is a need to dispose of infected animals and products in a hygienic manner and to thoroughly decontaminate premises and all items on IPs. Vehicles and people associated with the IPs must be cleaned and disinfected before leaving the premises.

Decontamination procedures must include the control of birds and insects. Pets must be confined as they may be able to mechanically transmit the virus.

3.2.8 Wild animal control

Feral pigs can be infected with CSF virus and it is, therefore, necessary to ensure that feral pigs do not come into contact with infected domestic pigs and that feral pigs in the area are controlled and destroyed if possible. Feral pigs may be included in surveillance programs to ensure that they are not infected with virus.

3.2.9 Media and public relations

The industry, the media and the public will need to be fully informed of the aspects of the disease and the control programs that will be adopted, to allay any concerns and to attempt to assure continuing demand for pig products. There needs to be ongoing liaison with all groups to ensure the flow of correct information and to maintain confidence in the product. Some opposition to the eradication strategies and concern about the product is likely and this may affect consumption.

3.3 Social and economic effects

Losses caused by CSF 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 alternative animal products might rise due to skills in demand. If eradication were achieved there is unlikely to be continuing damage to the industry beyond the need to recover its market share.

If CSF 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 CSF could spread in one year to piggeries holding up to 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 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.

The above estimates of loss include only the value of products at the farm gate. The cost to transport, processing and marketing industries is 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 CSF.

Virulent CSF is a disease of such severity that control measures would be adopted by most individual pig producers even if there were no compulsory control program. It is therefore difficult to assess the cost of living with CSF.

Benefit–cost analyses of CSF eradication have been undertaken for the United Kingdom and the EU. In the United Kingdom £12.3 million was spent between 1963 and 1966 to eradicate CSF and maintain a surveillance program. This lead to a benefit–cost ratio of nearly 4:1. An economic appraisal of four approaches to the control of CSF in the EU indicated there were economic advantages to phasing out the vaccination strategy and adopting a stamping-out policy.

Prolonged loss of income for producers whose herds are destroyed will have a serious social and economic effect on them and their families. Movement controls will cause severe disruptions to the marketing of slaughter-weight pigs and breeding stock. There is no compensation for lost market opportunities for uninfected farms included in a CA.

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.

The selected strategies have been formulated to keep the social effects to an absolute minimum, compatible with the goal of eradication.

Social effects will be further minimised if media reporting is rational and not sensationalised. Sensational reporting could lead to reduced pig meat consumption. The desired message to be conveyed in the popular media would be that control is being achieved in an efficient and humane manner (see the **Public Relations Manual, Sect. 3**).

3.4 Criteria for proof of freedom

The OIE Code (1992; Appendix 3) states, 'A country may be considered free from CSF when it has been shown that CSF has not been present for at least the past two years. This period shall be one year after the occurrence of the last *case* for countries in which a *stamping-out policy* is practised with vaccination against CSF and six months for countries in which a stamping-out policy alone is practised'.

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 an 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 States.

Any serological survey may need to include the feral pig population, particularly in the RA and adjacent areas.

3.5 Funding and compensation

Classical 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, Appendix 3** and in the **Valuation and Compensation Manual.**

3.6 Strategy if the disease becomes established

If the disease is considered to have become widespread the long-term control and eradication of the disease will be determined following consultation between the government and the pig industry. This may involve a vaccination program.

The selected strategy for low virulent CSF that is widespread when initially detected, may be accreditation of CSF-free herds, extension efforts to encourage voluntary control and possibly less restrictive movement controls. However, stamping out will still be considered the most appropriate strategy for low virulent CSF in most situations.

An epidemiological investigation would be needed to establish why CSF 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 may be either to continue to attempt eradication or to accept that CSF has become an endemic disease. 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 purporting to be legal waste vegetable feeders.

If CSF became endemic, vaccination at the discretion of owners would be an appropriate strategy. Voluntary accreditation schemes for CSF could also be considered. Any vaccinated animals will need to be identified so that they may be slaughtered at the most appropriate time in the eradication phase.

If feral pigs become infected then a major effort will be required to eliminate the infected group(s) or to reduce their numbers to a manageable level in the hope that the infection may die out. Every effort must be made to prevent contact between feral and domestic pig populations.

APPENDIX 1 Guidelines for classifying declared areas

Infected premises (IP)

Premises classified as an IP will be 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 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;
- 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, access to 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 contrast in size as confidence about the extent of the outbreak becomes clearer but must remain consistent with the OIE Code. In principle, animals and specified product will only be able to be moved out of the CA into the free area by permit.

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

APPENDIX 2 Recommended quarantine and movement controls

Infected and dangerous contact premises	**Suspect premises**
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	**Control area**
Movement out of pigs: Allowed for slaughter after monitoring 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 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 completed subject to CVO permit.	As for RA.
Risk enterprises:	
Prohibited until decontamination and tracing have been completed.	As for RA.
Sales, shows, etc:	
Prohibited if 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 classical swine fever

[NB The following text is taken directly from the OIE International Health Code (1992); Chapter 2.1.13. 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 CSF in 1993, 1994 or 1995.]

Preamble: For diagnostic tests and vaccine standards, reference should be made to the *Manual* (A13) [☞see OIE publications under References].

Article 2.1.13.1.

For the purposes of this *Code*, the *incubation period* for classical swine fever/hog cholera (CSF) shall be 40 days.

Article 2.1.13.2.

For the purposes of this *Code*:

CSF: *free country*

A country may be considered free from CSF when it has been shown that CSF has not been present for at least the past two years.

This period shall be one year after the occurrence of the last *case* for countries in which a *stamping-out policy* is practised with vaccination against CSF and six months for countries in which a stamping-out policy alone is practised.

CSF: *infected zone*

A CSF infected zone shall be considered as such until at least 40 days have elapsed after the last case has been reported and following the completion of a stamping-out policy and *disinfection* procedures, or six months after the clinical recovery or death of the last affected animal if a stamping-out policy is not practised.

Article 2.1.13.3.

Veterinary Administrations of CSF *free countries* may prohibit importation or transit through their territory, directly or indirectly, from countries considered infected with CSF of:

1) domestic and wild pigs;
2) *semen* of domestic and wild pigs;
3) *embryos*/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 CSF virus;
6) *products of animal origin* (from pigs) *for use in animal feeding or for industrial use* which have not been processed to ensure the destruction of CSF virus;
7) *products of animal origin* (from pigs) *destined for pharmaceutical use* which have not been processed to ensure the destruction of CSF virus;
8) *pathological material* and *biological products* which have not been processed to ensure the destruction of CSF virus;

Article 2.1.13.4.

When importing from CSF *free 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 CSF on the day of shipment;
2) were kept in a CSF free country since birth or for at least the past 40 days.

Article 2.1.13.5.

When importing from CSF *free countries*, *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 CSF on the day of shipment;
2) come from a CSF free country;

if the country of origin has a common border with a country considered infected with CSF:

3) were kept in a *quarantine station* for the 40 days prior to shipment.

Article 2.1.13.6.

When importing from countries considered infected with CSF, *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 CSF on the day of shipment;
2) were kept since birth, or for the past 40 days, in an *establishment* where no *case* of CSF was officially reported during that period, and that the establishment of origin is not situated in a CSF *infected zone*; or
3) were kept in a *quarantine station* for the 40 days prior to shipment;
4) have not been vaccinated against CSF (in the case of piglets, the mother sows have not been vaccinated against CSF); and
5) were subjected to the diagnostic tests for CSF with negative results; or
6) were vaccinated against CSF using a vaccine complying with the OIE standards (the nature of the vaccine used and the virus types and strains included shall also be stated in the certificate), not less than 15 days and not more than six months prior to shipment.

Article 2.1.13.7.

When importing from countries considered infected with CSF, *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 CSF on the day of shipment;

2) were kept in a *quarantine station* for the 40 days prior to shipment;

3) have not been vaccinated against CSF; and

4) were subjected to the diagnostic tests for CSF with negative results; or

5) were vaccinated against CSF using a vaccine complying with the OIE standards (the nature of the vaccine used and the virus types and strains included shall also be stated in the certificate), not less than 15 days and not more than six months prior to shipment.

Article 2.1.13.8.

When importing from CSF *free countries*, *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 CSF on the day of collection and for the following 40 days;
   b) were kept in a CSF free country for not less than 40 days prior to collection;
2) the semen was collected, processed and stored strictly in accordance with Appendix 4.2.2.1.

Article 2.1.13.9.

When importing from countries considered infected with CSF, *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 CSF on the day of collection and for the following 40 days;
   b) were kept in the *exporting country*, for the 40 days prior to collection, in an *establishment* or *AI centre* where no *case* of CSF was officially reported during that period, and that the establishment or AI centre is not situated in a CSF *infected zone;*
   c) have not been vaccinated against CSF; and

d) were subjected to diagnostic tests for CSF with negative results; or

e) were vaccinated against CSF using a vaccine complying with the OIE standards (the nature of the vaccine used and the virus types and strains included shall also be stated in the certificate);

2) the semen was collected, processed and stored strictly in accordance with Appendix 4.2.2.1.

Article 2.1.13.10.

When importing from CSF *free 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 CSF free country since birth or for at least the past 40 days;

2) slaughtered in an abattoir and found to be healthy before and after slaughter.

Article 2.1.13.11.

When importing from countries considered infected with CSF, *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 not been kept in a CSF *infected zone*;

2) slaughtered in an *abattoir* not situated in a CSF infected zone and found to be healthy before and after slaughter;

3) which have not been vaccinated with a live virus vaccine.

Article 2.1.13.12.

When importing from countries considered infected with CSF, *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 CSF virus;

3) necessary precautions were taken after processing to avoid contact of the meat with any source of CSF virus.

Article 2.1.13.13.

When importing from CSF *free 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 which have been kept in a CSF free country since birth or for at least the past 40 days.

Article 2.1.13.14.

When importing from CSF *free 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 a CSF free country since birth or for at least the past 40 days;
2) slaughtered in an abattoir and found to be healthy before and after slaughter.

Article 2.1.13.15.

When importing from countries considered infected with CSF, *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 CSF virus, in premises controlled and approved by the Veterinary Administration of the *exporting country*;

bristles

the presentation of an international sanitary certificate attesting that these products have been processed to ensure the destruction of CSF virus, in premises controlled and approved by the Veterinary Administration of the exporting country;

fertilizers of animal origin

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

1) come from animals which have not been kept in a CSF *infected zone*; or
2) have been processed to ensure the destruction of CSF virus.

Article 2.1.13.16.

When importing from countries considered infected with CSF, *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:

1) have been processed to ensure the destruction of CSF virus; or
2) come from animals which have not been kept in an CSF *infected zone*;
3) come from animals slaughtered in an *abattoir* and found to be healthy before and after slaughter.

APPENDIX 4 Procedures for proof of freedom

Proof of freedom

OIE Code Article 2.1.13.2. (see Appendix 3) states:

A country may be considered free from CSF when it has been shown that;

- CSF has not been present for at least the past two years;
- this period shall be one year after the occurrence of the last case for countries in which a stamping-out policy is practised with vaccination against CSF; and
- six months for countries in which a stamping-out policy alone is practised.

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 piggery operations 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) Whether vaccine has been used (see Section 2.2.9).
7) 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; and
   - 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 40 days have elapsed after the last case has been reported and following the completion of a stamping-out policy. A country practising stamping-out cannot claim freedom until at least 6 months have elapsed (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 a computer database
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.
Index case	The first or original case diagnosed in a disease outbreak (also index property).
Infected premises	*see* Appendix 1.
Local disease control centre	An emergency operations centre responsible for the command and control of field operations in a defined area.
Leucopoenia	A decrease in the number of white cells in the blood.
Movement controls	Restrictions placed on movement of animals, people and things to prevent spread of disease.
Quarantine	Legal restrictions imposed on a place, animal, vehicle or other things limiting movement.
Rendering	Processing by heat to inactivate infective agents. Rendered material may be used in various products according to 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).
Serosurveillance (serological survey)	Surveillance of an animal population by testing serum samples for the presence of antibodies to disease agents.
Sentinel animals	Animals of known health status monitored for the purpose of detecting the presence of a specific exotic disease agent.
Stamping out	Eradication procedures based on quarantine and slaughter of all infected animals and animals exposed to infection.
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 CSF — 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 have 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.
– 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 life cycle of the agent.
Viraemia	The presence of viruses in the blood.
Zoning	The process of defining disease-free and infected zones in accord with OIE guidelines, in order to facilitate trade.

Abbreviations

AAHL	CSIRO Australian Animal Health Laboratory, Geelong
AI	Artificial insemination
ANEMIS	Animal health emergency information system
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
ASF	African swine fever
CA	Control area
CCEAD	Consultative Committee on Exotic Animal Diseases
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSF	Classical swine fever
CVO	Chief veterinary officer
DCP	Dangerous contact premises
DPIE	Department of Primary Industries and Energy
EDTA	Ethylene diamine tetra-acetic acid (anticoagulant for blood)
ELISA	Enzyme-linked immunosorbent assay
EU	European Union
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.]

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

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INDEX