

AUSTRALIAN VETERINARY EMERGENCY PLAN

AUSVETPLAN

Enterprise Manual

Meat processing

Version 3.0, 2007

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

Primary Industries Ministerial Council

This enterprise manual forms part of:

AUSVETPLAN Edition 3

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

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IMPORTANT NOTE: Important regulatory information about emergency animal diseases is contained in the OIE Terrestrial Animal Health Code, which is updated annually and is available on the internet at the OIE website: http://www.oie.int/eng/normes/mcode/en_sommaire.htm

DISEASE WATCH HOTLINE

1800 675 888

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

Preface

This enterprise manual for the red meat/pigmeat processing industry is an integral part of the **Australian Veterinary Emergency Plan**, or **AUSVETPLAN (Edition 3)**. AUSVETPLAN structures and functions are described in the **AUSVETPLAN Summary Document**. The enterprise manuals are written with specific reference to certain animal industries where a greater than normal risk of harm could be expected from an emergency animal disease (EAD) outbreak.

This manual sets out the disease control principles that have been approved by the Primary Industries Ministerial Council (PIMC) out-of-session for use in an animal health emergency in Australia.

The manual is written for two major target groups:

- emergency disease decision-makers at state or national level who are unfamiliar with meat processing operations – the manual aims to provide both an overview of the meat processing industry and also guidance in appropriate policy and applicable procedures; and
- meat processing industry staff and veterinarians who need specific information on how to perform operational tasks to exclude, contain or eradicate the disease, and how to prepare contingency plans for their specific enterprises.

The two main situations in which this manual is expected to be applicable are:

- when a red/pigmeat processing establishment is operating in the vicinity of an EAD outbreak (see Section 3); and
- when an EAD is detected in an animal in an abattoir, or contaminated products are detected in a processing plant (see Section 4).

The manual provides background information on how meat processing establishments operate, and possible procedures to reduce the risk or effects on the industry of an EAD outbreak, while ensuring that these operations pose no risk of disease transmission (see Section 2).

The original version of this manual was prepared by a writing group with representatives from the Australian national and state governments and CSIRO.

Where in this manual text has been placed in square brackets [xxx], this indicates that that aspect of the manual remains contentious or is under development; such text is not part of the official manual. The issues will be worked on by experts and relevant text included at a future date.

Detailed instructions for the field implementation of AUSVETPLAN are contained in the disease strategies, operational procedures manuals, management manuals and wild animal manual. Industry-specific information is given in the relevant enterprise manuals. The full list of AUSVETPLAN manuals that may need to be accessed in an emergency is shown below.

In addition, *Exotic Diseases of Animals: A Field Guide for Australian Veterinarians* by WA Geering, AJ Forman and MJ Nunn, Australian Government Publishing

Service, Canberra, 1995 (to be updated) is a source for some of the information about the aetiology, diagnosis and epidemiology of the disease.

AUSVETPLAN manuals¹

Disease strategies

- Individual strategies for each of 30 diseases
- Bee diseases and pests
- Response policy briefs (for diseases not covered by individual manuals)

Operational procedures manuals

- Decontamination
- Destruction of animals
- Disposal
- Public relations
- Valuation and compensation
- Livestock welfare and management

Wild animal manual

- Wild animal response strategy

Enterprise manuals

- Artificial breeding centres
- Dairy processing
- Feedlots
- Meat processing
- Poultry industry
- Saleyards and transport
- Veterinary practices
- Zoos

Management manuals

- Control centres management (Parts 1 and 2)
- Animal Emergency Management Information System
- Laboratory preparedness

Summary document

¹ The complete series of AUSVETPLAN documents is available on the internet at: http://www.animalhealthaustralia.com.au/programs/eacp/ausvetplan_home.cfm

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1 Nature of the enterprise

1.1 The Australian meat processing industry

For the purpose of this manual, the red/pigmeat processing industry is defined as covering animals from the point of entry into a processing establishment (abattoir, deboning establishment, etc), up to and including the processing and distribution of all meat, co-products, and liquid and solid wastes. This includes pet food establishments and knackereries. Although game meat production is a separate industry, the principles contained in this manual are also applicable to that industry.

The meat processing industry involves the humane slaughter and hygienic processing of cattle, pigs, sheep and, to a lesser extent, horses, goats and deer for human consumption. Game animals are killed and eviscerated in the field before being transported to processing plants via holding chillers. If a vesicular disease were to become established in a remote area, feral pigs in a game plant may be the first indicators of disease.

It is important that local plans be developed and tested based on this manual. Such plans could be developed in conjunction with other local plans; for example, where abattoirs and saleyards are co-located, the plans should be linked.

1.1.1 Significance

In 2005, Australia exported red meat to more than 113 countries, generating income of over \$6.5 billion. We are one of the world's largest exporters of beef and veal (2005 value \$5 billion) and a major exporter of mutton, lamb and goat meat (\$1.5 billion). Australia is also an exporter of pigmeat (\$155 million) and horsemeat (\$6 million). Byproducts are valued at approximately \$500 million.

Any major emergency animal disease (EAD), such as foot-and-mouth disease, would have a marked effect on the Australian economy due to the trade implications of export restrictions.

Despite recent technological changes, the meat industry remains labour intensive. Many rural Australian towns depend on the livestock-producing industries and local meat processing plants for their economic prosperity. The meat processing industry provides tens of thousands of direct jobs in regional areas.

The presence of an EAD in just one meat processing establishment would affect all such establishments, and could result in reduced slaughterings. It is important that the livestock production and meat processing industries cooperate in any eradication program to reduce export restrictions and long-term loss of markets.

1.1.2 Structure

Meat slaughtering establishments are widely dispersed throughout the country, but most are in the high livestock density regions of southeastern Australia. In August 2006, the Australian processing industry comprised approximately

88 export-registered abattoirs, 32 export boning establishments, and another 116 export-registered meat processing establishments. Additional to export meat processing plants are plants, approved by state and territory authorities, producing meat and meat products for the domestic market.

Animals may be sent to slaughter through the saleyards system or sold directly 'over the hooks' from the producer's property. During a single day's production run, it is common for processing establishments to handle animals from many different farms, and the largest establishments may handle animals from four or more states. The abattoir, therefore, is a useful place to monitor the health of livestock. Close monitoring is needed because of the large mix of animals, the many stock movements, and the animals' potential exposure to livestock diseases. Vigilance is required to ensure that any signs of an EAD are quickly recognised and reported.

Beef slaughtering plants vary greatly in size; some have daily kill numbers in the thousands, while others might process a hundred carcasses. Most specialise in one species, but others kill up to three species at once on different chains. Many plants incorporate a boning room into their operations, while others transport carcasses elsewhere for boning. Other enterprises, such as independent boning rooms, smallgoods manufacturers, butcher shops and other retail outlets, add value to the industry.

Such diverse animal and product movements within the industry complicate the tracing process during an EAD outbreak. However, the National Livestock Identification Scheme (NLIS), a whole-of-life, individual animal identification scheme, has made a dramatic improvement in the traceability of cattle and, to a somewhat lesser extent, of sheep. Other systems, such as the National Vendor Declaration, transaction tags linked to state databases, and production chain segregation, have also improved traceability in recent times.

The meat processing industries produce large amounts of liquid and solid waste, including contaminated cartons, plastics, clothing and equipment. These wastes must be considered in EAD programs. The humidity arising from the industry's large water usage and the use of blowers for cooling and drying provides an environment that is conducive to the survival, multiplication and spread of many pathogens.

1.1.3 Legislation covering EADs and meat processing practices

National, state and territory legislation has been enacted for the purpose of controlling EADs.

The Commonwealth legislation is mainly concerned with preventing the introduction and establishment of disease or the introduction of things that may carry disease. State and territory legislation aims to control and eradicate disease in animals, and establishes controls over the whole field of animal movement, treatment, decontamination, slaughter and compensation. Wide powers are conferred on government inspectors, including the power to enter premises, to order stock musters, to test animals, and to order the destruction of animals and products that are suspected of being infected or contaminated.

A list of state and territory EAD legislation is provided in Appendix 1 of the AUSVETPLAN **Summary Document**.

Other legislation that could be relevant to control procedures in the meat processing industry is listed below.

Commonwealth

- *Export Control Act 1982*, which includes regulations covering the export of meat and meat products
 - Prescribed Goods (General) Orders 2005
 - Export Control (Meat and Meat Products) Orders 2005
 - Game, Poultry and Rabbit Meat Orders
 - Australian Export Meat Manuals (Volume 2)
- *Australian Meat and Livestock Industry Act 1997*
- *Meat Inspection Act 1983*
- *Quarantine Act 1908*

There is also an Australian Standard for the Hygienic Production and Transportation of Meat and Meat Products for Human Consumption (SCARM 80).

New South Wales

- *Meat Industry Act 1978*
- *Food Act 2003*
- Food Production (Meat Food Safety Scheme) Regulation 2000

Victoria

- *Meat Industry Act 1993*
- *Food Act 1984*
- *Food (Amendments) Acts 1997 and 2001*
- Meat Industry Regulations 1994

Queensland

- *Food Production (Safety) Act 2000*
- *Food Act 1981*
- Food Hygiene Regulation 1989
- Food Standards Regulation 1994
- Meat Industry Regulations 1994

- Meat Industry Standard 1994

Western Australia

- *Health Act 1911*
- Health – Meat Inspection, Branding and Processing Regulations 1950
- Health (Game Meat) Regulations 1992

South Australia

- *Livestock Act 1997*
- *Food Act 2001*
- *Meat Hygiene Act 1994*
- Meat Hygiene Regulations 1994

Tasmania

- *Meat Hygiene Act 1997*
- *Food Act 2003*

Northern Territory

- *Food Act 2004*

Australian Capital Territory

- *Food (Amendment) Act 1997*
- Public Health (Meat) Regulations
- *Meat Act 1931*

1.1.4 Animal welfare

It will be essential to maintain high animal welfare standards during an EAD response, consistent with legislation, codes and the Australian Animal Welfare Strategy.

The **Livestock Welfare and Management** operational procedures manual is relevant to the response plans described in this manual.

Commonwealth

The Australian Animal Welfare Strategy² provides a framework for the development of future Australian animal welfare policies and approved standards. It uses a national consultative approach to derive high standards of animal welfare that are based on scientific evidence and take into account changes in whole-of-community standards. The strategy – which clarifies the roles and responsibilities of community, industry and government organisations in improving animal welfare outcomes – will provide greater harmony and consistency across Australia.

Below is a list of state and territory legislation covering animal welfare.

New South Wales

- *Prevention of Cruelty to Animals Act 1979*

Victoria

- *Prevention of Cruelty to Animals Act 1986*

Queensland

- *Animal Care and Protection Act 2001*

Western Australia

- *Animal Welfare Act 2002*

South Australia

- *Prevention of Cruelty to Animals Act 1985*

Tasmania

- *Animal Welfare Act 1993*

Northern Territory

- *Animal Welfare Act 1999*

Australian Capital Territory

- *Animal Welfare Act 1992*

1.1.5 Codes of practice

National standards and national model codes of practice for animal welfare in the livestock industries provide minimum standards for the duty of care to be given to animals. They have been adopted throughout Australia, either directly by reference in legislation or indirectly in the development of state and territory codes

² <http://www.daff.gov.au/aaws>

to meet specific regional needs. The model codes are also used as a resource for the development of training and awareness programs.

A list of codes of practice that may be relevant is in Appendix 3.

1.2 Emergency diseases of concern

Fifty-eight diseases potentially affecting meat producing species are currently identified as sufficiently serious to require national response agreements (see Appendix 1). Most are exotic, but some (such as anthrax and Hendra virus) are endemic. These EADs are covered by a cost-sharing agreement permitting the costs of eradication to be shared between the Australian Government, the state and territory governments, and industry.

This manual focuses on those diseases that could be transmitted by animal products.

Veterinarians and others looking for detailed, disease-specific information should refer to the individual **Disease Strategies** or to *Exotic Diseases of Animals: A Field Guide for Australian Veterinarians* by WA Geering, AJ Forman and MJ Nunn, Australian Government Publishing Service, Canberra, 1995.

Information on the persistence of disease agents in carcasses and animal products can be found in *Persistence of Disease Agents in Carcasses and Animal Products*, a report for Animal Health Australia by Scott Williams Consulting Pty Ltd, revised in December 2003.³

Tables 1 and 2 (at the end of this section) address recommendations of the World Organisation for Animal Health (OIE, formerly Office International des Epizooties) for relevant EADs.

1.2.1 Diseases that can be transmitted by animal products or byproducts and for which AUSVETPLAN strategies have been developed

For more information on the diseases described below, see the relevant **Disease Strategy**.

African horse sickness

African horse sickness is an infectious, insect-borne viral disease of horses and mules, with other equines only slightly affected. It is frequently fatal in susceptible horses, with clinical signs and lesions arising from selective increased vascular permeability, resulting in an impairment of the respiratory and circulatory systems. In nature, the virus is transmitted by midges (*Culicoides* spp), causing a seasonal incidence in temperate climates.

Dogs can be infected by eating horsemeat. Dogs should not have access to hides, other raw byproducts or discharges.

³ <http://www.animalhealthaustralia.com.au> (see AUSVETPLAN Manuals/Resource documents)

African swine fever

African swine fever is a highly contagious, generalised viral disease of pigs; the virus has no other mammalian hosts. The virus is transmitted by direct contact, inanimate objects and ticks, and is very resistant to inactivation. The acute form of the disease is characterised by pronounced haemorrhage of internal organs and a mortality of up to 100% in infected herds. Milder forms of the disease also occur.

All products and byproducts are potentially infective, and live pigs must have no contact with them. Swill feeding must be strictly prohibited. Pigs that die in the pens on the establishment should be disposed of by rendering (see Appendix 4), incineration or secure burial.

Anthrax

Anthrax is an acute, infectious bacterial disease that can affect humans and a wide range of domestic and wild animals. In cattle, sheep and goats, the disease is usually peracute – infected animals are often found dead before any signs of illness are observed (except perhaps on dairy cattle that are under continuous and careful observation).

Anthrax is unusual among animal diseases in that it is not contagious (ie it is not spread from animal to animal). It is spread by release of bacterial spores from the carcase of an animal that has died of the disease and the subsequent ingestion of these spores by other animals. The period during which infection is systemic is short, and the risk of spread of infection by preclinical infected animals is limited.

In countries in which the disease is not well controlled, regular outbreaks of anthrax can become serious epidemics of both animals and humans.

Only the cutaneous form of anthrax has ever been reported in humans in Australia: pulmonary and intestinal forms have never been reported here. In the 1920s and 1930s, cutaneous cases were associated with infected shaving brush bristles.

Meat and meat products from animals that have died of anthrax can spread the disease to animals and humans that eat these products untreated or without adequate treatment to destroy infection. Humans handling such products can contract cutaneous anthrax.

Traditionally, meatmeal and bonemeal prepared from animals that have died of anthrax was a significant means of spreading anthrax, but adequate control of processing standards has eliminated the transfer of infection. Time/temperature and moisture controls at rendering, and the prohibition on the feeding of meatmeal and bonemeal to ruminants, ensure that these products are not involved in the spread of anthrax in Australia.

Aujeszky's disease

Also known as pseudorabies, Aujeszky's disease is caused by a herpesvirus that infects the nervous system and other organs, such as the respiratory tract, in virtually all mammals except humans and the tailless apes. It is primarily associated with pigs, which may remain latently infected following clinical recovery.

Products may be used for human consumption, but there is some risk of infection in dogs and cats fed raw contaminated meat or offal. Dogs have died as a result of eating meat from viraemic pigs. Products and co-products are not thought to present a risk of infection to pigs because a large dose of virus is needed to infect via the oral route in this species. Products and co-products derived from viraemic animals are potentially infective to other host species.

Effluent from pens and yards should be disposed of in a manner that prevents contact by host species. Aujeszky's disease virus will not survive more than 3 days in effluent pits.

Bovine spongiform encephalopathy

Bovine spongiform encephalopathy (BSE) is a fatal neurological disease of adult cattle, characterised by a long incubation period followed by progressive neurological degeneration. Typical signs are abnormal posture, development of violent behaviour, heightened sensory perception, decreased milk production, weight loss (despite a good appetite) and death.

The disease was first recognised in the United Kingdom in 1986, and probably arose because changed practices in processing meatmeal permitted transmission of the scrapie agent, which infects sheep, to cattle.

Animals showing neurological signs are to be identified to property of origin, clinically examined and subjected to postmortem, and the brain is to be collected for laboratory examination. Detailed special procedures for brain collection should be followed. Animals suspected of having BSE should be destroyed and not used for human or animal consumption.

Classical swine fever (hog cholera)

Classical swine fever is a highly contagious disease capable of spreading rapidly in susceptible pig populations. In its acute form, the disease is characterised by fever, severe depression, multiple haemorrhages and rapid deaths. Virus strains of lower virulence cause subacute and chronic forms of the disease that include complications of pneumonia and diarrhoea. Typically, it is clinically indistinguishable from African swine fever.

Contaminated products and byproducts may infect pigs. The disease is easily transmitted through feeding with contaminated swill.

Foot-and-mouth disease

Foot-and-mouth disease (FMD) is an acute, highly contagious viral infection of domestic and wild cloven-hoofed animals. It is characterised by fever and vesicles in the mouth and nose and on the feet and teats. Serious production losses can occur, but deaths are unlikely except among young animals.

Virus survives longer in bone marrow and lymph nodes than it does in meat, and may remain in hides for long periods.

Virus may remain viable in blood for 4 or 5 days, and special attention should be paid to preventing live cattle from coming into contact with contaminated blood.

Rift Valley fever

Rift Valley fever is a mosquito-borne disease of cattle, sheep, goats and humans, characterised by high rates of abortions and high rates of mortality in young animals. Severe disease can occur in humans, requiring special safety precautions.

Rinderpest

Rinderpest is an acute, highly contagious disease principally of cattle ('cattle plague'). It is characterised by high fever, nasal and ocular discharges, laboured breathing, severe (often bloody) diarrhoea and death. The virus, which is related to those that cause measles, canine distemper and peste des petits ruminants, is not stable in the environment. Spread is by very close contact.

Pigs can also be infected by eating meat from an infected animal.

Scrapie

Scrapie is a transmissible spongiform encephalopathy that occurs in sheep and goats. It is primarily transmitted from ewe (or doe) to offspring. This occurs either prenatally or shortly after birth, due to close contact between dam and offspring, probably via contaminated uterine fluids. Other horizontal spread may also occur, especially when lambing occurs in confined areas. Scrapie has a long incubation period (1–3 years or longer). Clinical signs of pruritus and incoordination progress to depression, recumbency and death. Animals that never develop clinical signs can still be a source of infection to others.

Sheep pox and goat pox

Sheep pox and goat pox, caused by capripox virus, are highly contagious skin diseases of small ruminants, and are characterised by fever, salivation, and pustules on exposed body surfaces, often with a high mortality rate. The capripox virus is very resistant to inactivation in the environment, but the degree of host specificity varies.

Meat products are unlikely to be a source of spread.

Some strains of capripox virus may cause very mild skin lesions in people.

Swine vesicular disease

Swine vesicular disease is caused by an enterovirus closely related to the human Coxsackievirus B5. The disease is characterised by fever and lameness caused by vesicles and erosions on the feet, and is clinically indistinguishable from foot-and-mouth disease.

Products (including smallgoods and casings) and byproducts from infected pigs remain infective for long periods, especially if the material is refrigerated.

The virus can survive for many months in contaminated buildings and vehicles and on pastures. It can survive in pig faeces for at least 4 months.

Transmissible gastroenteritis

Transmissible gastroenteritis (TGE) is an enteric viral disease of pigs, caused by a coronavirus, that results in rapid dehydration, profuse diarrhoea and rapid death in piglets under 3 weeks old.

Carcase material from pigs infected with TGE virus can be a source of infection. Freezing infective tissue does not significantly affect infectivity. Post-slaughter acidification does not affect the infectivity of TGE virus in pig products. Cooking will destroy the virus. The survival of TGE virus in salted and cured meats is unknown. However, virus has been difficult to detect even during acute infections, and carcass muscle tissue is not considered to be a major reservoir of virus.

Vesicular exanthema

Vesicular exanthema is an acute viral disease of pigs, characterised by vesicles on the snout, in the mouth and on the feet. The clinical disease is indistinguishable from foot-and-mouth disease. The vesicular exanthema virus is very closely related to viruses isolated from marine mammals, and an outbreak in pigs was associated with the feeding of contaminated food scraps containing marine mammal product.

Vesicular stomatitis

Vesicular stomatitis (VS) is principally a disease of cattle, horses and pigs. It can cause signs indistinguishable from foot-and-mouth disease, except that horses are infected. The disease has only been seen in North, Central and South America. The epidemiology of the disease is unclear, but transmission cycles between insects and small wild mammals are known to occur.

People can become infected with VS virus clinically or subclinically. Meat products and byproducts are thought to pose minimal risk of spread, even to humans.

The virus apparently survives no more than several days in premises that have housed infected animals, although it has been shown experimentally to survive longer at lower temperatures and in the presence of organic matter. Cleaning is more important than disinfection in the elimination of VS virus.

1.2.2 Diseases of minimal or no risk of transmission by meat or meat byproducts

The diseases summarised below are of little consequence in the meat production or processing enterprise, but there may be a risk of transmission via live animals waiting in lairages before slaughter, or via insect vectors. For more information, see the relevant **Disease Strategy**.

Bluetongue

Bluetongue is a viral disease of ruminants transmitted only by specific species of biting midges. Sheep are the most severely infected, the disease in that species being characterised by inflammation of the mucous membranes, widespread haemorrhages and oedema. Eight serotypes of the virus have been detected in northern Australia.

Equine influenza

Equine influenza is an acute respiratory disease of equines, and may cause rapidly spreading outbreaks among horses congregating. Clinical signs include a sudden onset of pyrexia, a deep hacking cough and nasal discharge.

Separation between horses is the main precaution required. In establishments that slaughter equines, separation should be maintained between horses on the premises, between lots, and between horses on neighbouring premises.

Japanese encephalitis

Japanese encephalitis is a mosquito-borne viral disease of humans and animals, principally pigs and horses. The disease occurs throughout much of Asia, and causes significant numbers of human mortalities in some countries. Adult pigs normally show no clinical signs, but pregnant sows may abort or produce mummified foetuses or stillborn or weak piglets. In horses, the clinical signs vary from a mild transient fever to high fever, blindness, collapse, and death in 5% to 40% of infected animals.

The virus does not persist outside infected animals and mosquitoes. The production of domestic pigmeat or game pigmeat and their co-products does not pose any threat to humans, as the virus is not transmitted by these products.

Peste des petits ruminants

Peste des petits ruminants in sheep and goats resembles rinderpest of cattle and is caused by a closely related virus. The disease is characterised by fever, enteritis, and high morbidity and mortality.

The virus is rapidly inactivated in the carcass, but some reports suggest that it may persist in meat frozen immediately after slaughter.

Rabies

Rabies is an almost invariably fatal viral encephalitis affecting all warm-blooded animals. It is transmitted principally by the bite of a rabid animal, and has a long and variable incubation period. The main reservoir hosts include members of the Canidae (dogs, foxes).

If the presence of a rabid animal is suspected, human safety is paramount. Extreme care must be taken in dealing with suspect animals. Animals exhibiting any of the signs of rabies should not be handled, and muzzling of suspect carnivores should not be attempted.

Screw-worm fly

Myiasis caused by larvae of the screw-worm fly is characterised by larvae feeding on living tissue in open wounds of any warm-blooded animal host, including humans, resulting in debility and some deaths. The flies prefer warm, moist conditions and temperature ranges between 16°C and 30°C.

Prophylactic treatment with appropriate insecticides should be carried out on working animals. The problem of insecticide residues in meat for human consumption means that the withholding period for insecticides applied to food

animals must be observed. Only approved insecticides may be used. Animals may be treated and held before slaughter, but may need to be killed because of welfare considerations.

1.2.3 Occupational health and safety

In addition to the diseases listed below, some every-day diseases in the abattoir environment (such as leptospirosis and Q fever) pose a health risk. Such diseases could also pose a risk to temporary staff during incidents, so vaccination of some of these temporary workers should be considered.

Vesicular stomatitis frequently occurs in humans, causing influenza-like symptoms, but it rarely produces vesicles.

Screw-worm fly myiasis may occur in any warm-blooded animal, including humans, if simple hygiene procedures and precautions are not observed.

Rift Valley fever can be contracted by inhalation of aerosols and by contact with infected blood. It is potentially fatal.

Rabies can be transmitted through skin abrasions and saliva from infected animals.

Capripox virus has been reported as causing lesions, such as small red papules and vesicles on the hands and arms, in humans working with some strains of the virus in Sweden and India. No generalised disease has been reported.

Japanese encephalitis can be transmitted from infected animals by mosquitoes, but contact with infected blood is not a risk.

In recent years, zoonotic diseases for which there is no AUSVETPLAN strategy have emerged. These are *Nipah virus* and *Hendra virus*.

1.2.4 AUSVETPLAN and OIE international standards

All the diseases listed in Tables 1 and 2 are covered by the *Government and Livestock Industry Cost Sharing Deed in Respect of Emergency Animal Disease Responses* (EAD Response Agreement). Information about the EAD Response Agreement can be found in the **Summary Document** and on the Animal Health Australia website.⁴

The classifications of EADs covered by the EAD Response Agreement are shown in Appendix 1.

OIE international standards

The OIE, established in 1924 to promote world animal health, provides standards for health regulations for the international trade of animals and animal products. For animals covered by this manual, this is achieved through the *OIE Terrestrial Animal Health Code*.⁵ The aim of the Terrestrial Code is to assure the sanitary safety of international trade in terrestrial animals and their products. This is achieved

⁴ <http://www.animalhealthaustralia.com.au/programs/eadp/eadra.cfm>

⁵ http://www.oie.int/eng/normes/mcode/en_sommaire.htm

through the detailing of health measures to be used by the veterinary authorities of importing and exporting countries to avoid the transfer of agents pathogenic for animals or humans, while avoiding unjustified sanitary barriers.

Part 1 of the Terrestrial Code presents definitions of the terms and expressions used, procedures for international reporting of diseases, ethical rules for international trade and certification, the principles of import risk analysis, and the organisation of import and export procedures.

Part 2 sets out the measures recommended by the OIE to cover the 'priority' diseases for international trade. These measures take into account the wide range of animal disease situations that may prevail in OIE member countries.

The Terrestrial Code recommendations for each disease are shown in the relevant **Disease Strategy**. Tables 1 and 2 provide linkages to the relevant parts of the Terrestrial Code recommendations specifically relating to red meat and pigmeat and meat byproducts.

Table 1 OIE Terrestrial Code recommendations for diseases transmitted by red meat, pigmeat or meat byproducts

Disease	OIE incubation/ infective period	OIE recommendations
African horse sickness	Infective period ^a 40 days	http://www.oie.int/eng/normes/mcode/en_chapitre_2.5.14.htm
African swine fever	Infective period 40 days	http://www.oie.int/eng/normes/mcode/en_chapitre_2.6.6.htm
Anthrax	Incubation period ^b 20 days	http://www.oie.int/eng/normes/mcode/en_chapitre_2.2.1.htm
Aujeszky's disease	No period given	http://www.oie.int/eng/normes/mcode/en_chapitre_2.2.2.htm
Bovine spongiform encephalopathy	No period given	http://www.oie.int/eng/normes/mcode/en_chapitre_2.3.13.htm
Sheep pox and goat pox	Incubation period 21 days	http://www.oie.int/eng/normes/mcode/en_chapitre_2.4.10.htm
Classical swine fever	Incubation period varies from 5 days to 3 months in cases of chronic infection	http://www.oie.int/eng/normes/mcode/en_chapitre_2.6.7.htm
Foot-and-mouth disease	Incubation period 14 days	http://www.oie.int/eng/normes/mcode/en_chapitre_2.2.10.htm
Lumpy skin disease	Incubation period 28 days	http://www.oie.int/eng/normes/mcode/en_chapitre_2.3.14.htm
Peste des petits ruminants	Incubation period 21 days	http://www.oie.int/eng/normes/mcode/en_chapitre_2.4.9.htm
Rift Valley fever	Infective period 30 days	http://www.oie.int/eng/normes/mcode/en_chapitre_2.2.14.htm
Rinderpest	Incubation period 21 days	http://www.oie.int/eng/normes/mcode/en_chapitre_2.2.12.htm
Swine vesicular disease	Incubation period 28 days	http://www.oie.int/eng/normes/mcode/en_chapitre_2.6.5.htm
Transmissible gastroenteritis	Infective period 40 days	http://www.oie.int/eng/normes/mcode/en_chapitre_2.6.4.htm
Vesicular exanthema	No OIE entry	
Vesicular stomatitis	Incubation period 21 days	http://www.oie.int/eng/normes/mcode/en_chapitre_2.2.11.htm

a The infective period is the longest period during which an affected animal can be a source of infection; infection means presence of the pathogenic agent in the host.

b The incubation period is the longest period that elapses between the introduction of the pathogen into the animal and the occurrence of the first clinical signs of the disease.

Table 2 OIE international standards for diseases of minimal or no risk of transmission by meat or meat byproducts

Disease	OIE incubation/ infective period	OIE recommendations
Bluetongue	Infective period 60 days	http://www.oie.int/eng/normes/mcode/en_chapitre_2.2.13.htm
Japanese encephalitis	Incubation period 21 days	http://www.oie.int/eng/normes/mcode/en_chapitre_2.2.15.htm
Screw-worm fly	Not applicable	http://www.oie.int/eng/normes/mcode/en_chapitre_2.2.8.htm
Rabies	Incubation period 6 months	http://www.oie.int/eng/normes/mcode/en_chapitre_2.2.5.htm

- a The infective period is the longest period during which an affected animal can be a source of infection; infection means presence of the pathogenic agent in the host.
- b The incubation period is the longest period that elapses between the introduction of the pathogen into the animal and the occurrence of the first clinical signs of the disease.

1.3 Animal species and/or products entering the enterprise

This manual is written with the major abattoir species of cattle, sheep and pigs in mind. However, the principles contained in it can be applied to any species being killed and processed for human consumption. Similar principles apply to premises that receive animal products for further processing.

The entry and exit of people, vehicles and equipment may also play a role in disease transmission.

1.4 Output of animals, products, byproducts and discharges

1.4.1 Risk of disease spread from the enterprise

In determining the disease risk posed by different products and byproducts, the following should be kept in mind:

- the organism causing the infection must have the potential to be present and persist in the products involved;
- the opportunity must be present for susceptible animals to come into contact with the products;
- the pathogen must be present in an adequate dose to initiate infection;
- infection must be able to occur from contact with products, for example:
 - ingestion of meat in African swine fever and classical swine fever
 - ingestion of pasture contaminated with effluent containing the infective organism
 - contact with skins, as in capripox virus
 - contact with personnel or things.

Full details about the diseases can be found in their respective **Disease Strategies**.

Many products derived from the meat processing enterprise are used by or on grazing animals and other animals. Examples are animal proteins fed to pigs and poultry, casings for processing into catgut, animal products used for biological materials, and effluent used on pastures. Table 3 illustrates the risks for some diseases.

Diseases may also be transmitted from animals in lairages awaiting slaughter. Transmission could be via insect vectors, or via wind or aerosol spread.

Table 3 Risk of disease spread to susceptible animals through products, byproducts and discharges from infected animals in meat processing enterprises

	Bone in meat	Deboned meat	Hides and skins	Offals (includes red and green)	Nervous tissue	Effluent (yards, slaughter floor)	Meat, blood and bonemeal ^a	Manure, paunch and visceral contents
African horse sickness	+	+	-	+	-	+	-	-
African swine fever	+++	+++	+	+++	-	++	-	+
Anthrax	+++	+++	++	+++	+	++	- ^b	+
Aujeszky's disease	++	++	-	++	-	+	-? ^c	+
Bluetongue	-	-	-	-	-	-	-	-
Bovine spongiform encephalopathy	? ^d	-	-	++	++	-	+	-
Capripox (sheep and goat pox)	-	-	+++	-	-	++	-	-
Classical swine fever (hog cholera)	+++	+++	-	+++	-	+	-	-
Equine influenza	-	-	-	-	-	+	-	-
Foot-and-mouth disease	+++	++	+	+++	-	+	-	+
Japanese encephalitis	-	-	-	-	-	-	-	-
Lumpy skin disease	-	-	+++	-	-	++	-	-
Peste des petits ruminants	+	+	-	+	-	+	-	+
Rabies	-	-	-	-	+	-	-	-
Rift Valley fever	-	-	-	-	-	+	-	-
Rinderpest	+	+	-	+	-	+	-	+
Scrapie	-	-	-	-	+	+	+ ^e	-
Screw-worm fly	-	-	-	-	-	-	-	-
Swine vesicular disease	+++	+++	-	+++	-	++	-	-
Transmissible gastroenteritis	+	+	-	+++	-	++	-	++
Vesicular exanthema	++	++	-	++	-	+	-	+
Vesicular stomatitis	-	-	-	-	-	+	-	-

+ = definite risk; - = no known risk; ? = not known or uncertain

a It is illegal to feed this material to ruminants

b Traditionally, meat and bonemeal have been a source of infection; however, with adequate control of processing standards and the ban on feeding to ruminants, this should not be a source of infection in Australia.

c Only if viraemic at time of slaughter

d Could possibly be involved in spread if contains lymph node material

e The scrapie agent is believed to be the probable initial cause of bovine spongiform encephalopathy through feeding of contaminated meat and bonemeal, produced from sheep carcasses, in which the agent had not been destroyed by the rendering systems.

2 Risk reduction and contingency planning

Contingency planning is necessary in the event of an emergency animal disease (EAD) outbreak, but also has benefits in other emergency situations, such as chemical residue incidents. Forward planning to cope adequately with a disease affecting an establishment will allow a more organised and rapid response and a faster return to normal commercial production.

2.1 Design of the enterprise

Correct layout, correctly organised movements of products and the separation of 'dirty' from 'clean' areas will result in better control of all products and personnel during an EAD outbreak. The enterprise should be designed to minimise the risk of transmission of the significant disease-causing agents, including those of EADs. The Australian Quarantine and Inspection Service (AQIS) document, *Construction and Equipment Guidelines for Export Meat*, contains guidelines to ensure that the enterprise's design and structure are compatible with disease eradication principles. The more important design issues to be complied with are outlined below.

Areas where live animals are assembled must be kept as isolated as possible from slaughtering and processing areas, as live animals will be the major source of infection and risk to other products and personnel. The areas must be separately drained. If possible, livestock entrances should be separate from entrances to other areas of the establishment and away from the main buildings.

Highly contaminated areas, such as slaughter floors, hide and skin sheds, and byproduct areas, must be closed off from edible-product processing areas.

The various sections must be designed so that products do not have to pass unnecessarily through one section enroute to another section.

All meat processing facilities must be made of materials that enable easy and thorough cleaning and disinfection, and that allow proper maintenance.

All drainage from the establishment must be able to be contained and treated when necessary. Drainage from dirty areas must not pass through or near clean areas. Holding capacity in wet and dry weather should be known. Planning should also cover treatment options and downstream risks if untreated material is not successfully contained.

There should be facilities for cleaning out livestock trucks before the vehicles leave the enterprise, so that cleaning and disinfection procedures can be implemented quickly in an emergency. Such facilities would be mandatory in an EAD response.

2.2 Procedures for early detection of disease

Personnel dealing with livestock must be specially targeted for training and be observant for any unusual disease signs. This is particularly important for staff who have susceptible livestock at home or who are in frequent contact with livestock. When sick animals are observed, they must be isolated and reported to the establishment's veterinarian, a senior meat inspector or the district veterinary officer. Details of the lot, including the lot number, the owner or the place of origin of the lot, and the number involved, must be recorded. Individual National Livestock Identification Scheme (NLIS) numbers are particularly helpful. Details of the transport must be documented. Permits or documentation accompanying stock should be accurately filed.

Establishment veterinarians must be aware of the possibility of disease and the EAD response strategies that have been developed, and must maintain regular contact with state or territory veterinary officials. If a disease condition suggests an EAD, they must be aware of the actions to be implemented as soon as possible.

2.3 Training of staff

The training of staff for handling an EAD will result in a better organised response and possibly an earlier return to normal enterprise functions. National training is provided by Animal Health Australia. It would be desirable for one of the government personnel at each abattoir to achieve competency as an infected premises site supervisor.

Livestock staff require training in observation and the ability to recognise abnormalities in animals, but not necessarily to a level at which they could diagnose an EAD. Early recognition of the abnormal, with rapid reporting, should be emphasised. Where companies are responsible for antemortem and postmortem activities, it is even more important that personnel be properly trained and certified in these duties, and subject to regular audit.

All staff should be adequately informed about the ways that diseases are transmitted and about products and things that may be involved. Poor personal hygiene and poor practices may increase the risk of transmission, and appropriate procedures need to be implemented to minimise spread. Staff should not become involved in the EAD response unless directed to do so, and must follow closely the directions of the disease control authorities. Staff will need to be trained in what is expected of them in an emergency, what they must do and where they must assemble.

An important part of training is to 'test', and the effectiveness of training should be established by testing before an incident. If possible, a simulated exercise of handling an EAD outbreak at the establishment should be undertaken periodically and a video made of the procedures. The video would be a useful tool for training enterprise staff.

Management must be trained to a high level of readiness in containment, cleaning and disinfection procedures, so that they can assist in supervision of decontamination procedures and in staff and product control. Management must

prepare job cards appropriate to each person's training to enable an organised approach during an EAD incident.

The consequences of an EAD discovery should be discussed with key union officials in advance of any outbreak, so that there is a general awareness of actions required.

2.4 Good work procedures and staff hygiene

The establishment of good work procedures and staff hygiene will help to contain the spread of contaminated products.

A system must be established to separate animals completely from processing areas. If possible, vehicles carrying livestock should enter the establishment through different entrances from personnel and vehicles used for handling the finished product. Details of vehicles carrying livestock must be recorded, together with times of entry to the establishment.

Vehicles must not be used for carrying product into or out of the establishment unless they have been adequately cleaned; their movement must be restricted until they have been cleaned.

Staff need to be made aware of limits on their movements outside their immediate work areas, and of the need to properly and regularly clean their hands and follow other personal hygiene practices to minimise the risk of introduction or spread of the disease agent. Staff movements around the establishment must be restricted to an 'as needs' basis; for example, personnel working in potentially highly contaminated areas must be separated from personnel in processing areas.

The use of clean clothing for work and the retention of clothing and boots on the premises each day will help to minimise the spread of disease.

Generally, occupational health and safety and disease control activities should work together; however, in an occupational health and safety emergency, personnel health and safety should take precedence over disease control. For example, in an emergency that requires an ambulance to be called, the ambulance must not be impeded by disease-control restrictions. Corrective disease-control actions needed after such an incident should be taken immediately after the health issue has been resolved.

2.5 Internal quarantine

Internal quarantine facilities and procedures should be set up in advance of an outbreak. This would be facilitated by the design of the facilities being consistent with the AQIS document, *Construction and Equipment Guidelines for Export Meat*.

The overall objective of internal quarantine is to minimise movements. Any movements should be from low-risk to high-risk areas. Records must be kept of any such movements (including movements of animals, equipment, personnel, vehicles, products, byproducts and waste).

Suspect animals must be isolated in a sick or suspect pen for veterinary examination. Sick animals must be removed from the animal holding yards, isolated, and held for veterinary examination, or treated or disposed of in an acceptable manner.

If possible, animals from different groups should be kept separate until they move to the knocking box.

Animal holding pens should be cleaned regularly and maintained in an acceptably clean state.

2.6 Veterinary services

The establishment veterinarian or senior officer will be responsible for general oversight and for ensuring that animals being presented for slaughter are healthy. This officer can also be a source of information and help to train staff in EAD response procedures.

The state or territory veterinary authorities must be contacted in the event of suspicion or confirmation of an EAD incident. As detailed in Part 1 of the **Control Centres Management Manual**, the appropriate stage of activation (eg Alert Phase) will be confirmed. Actions for each phase are listed in the manual.

2.7 Disposal methods

More detailed information on disposal methods can be found in the **Disposal Procedures Manual**.

Many meat processing establishments have a rendering plant on the premises, and this can be useful in the disposal of animals and products during an EAD outbreak. Not all rendering plants will be suitable for the destruction of some pathogens (see Appendix 4). It may be necessary to identify a site, preferably within the establishment, that is suitable for the burning or burial of carcasses and products. If disposal is not possible within the establishment, carcasses and product may need to be transported elsewhere to a common burial or burning site. Disposal by composting may be an option, as is air curtain incineration. Another option may be to freeze carcasses and processed material and store them in freezers until disposal is organised.

A burial site must be situated so that fluids do not leach to other areas or into water sources. The site must have easy access for vehicles, and the terrain and soil must be suitable for digging pits according to engineering advice.

It may be possible to combine the rendering plant and burial or burning disposal methods. Disposal generally needs to be carried out quickly to contain the spread of disease. However, environmental and resource issues often preclude immediate disposal by burial or burning. If immediate disposal by burial or burning could not be done, one option would be to render first using the parameters appropriate for the disease agent. The rendered material can be stored relatively safely pending a decision on whether the material can be used or is to be destroyed. Sampling and testing of the rendered material may be undertaken before a decision is made.

Wastewater disposal methods need to be documented. Wastewater should be able to be retained for treatment, if necessary. It may be possible to direct wastewater to an area that can be kept free from stock for a lengthy period and that will not allow the wastewater to leach out or drain off. As part of contingency planning for wastewater disposal, the enterprise should determine the holding capacity during wet weather, options for treatment on and off site, and the feasibility of transporting off site for treatment if on-site treatment is not possible.

2.8 Records

Well maintained records of animals and products entering and leaving the establishment enable fast and reliable tracing, and may allow some product to be saved from destruction.

Under Australian legislation, all plants must have a procedure for product traceability, withdrawal and recall. The origin, destination, quantities and types of product entering and leaving the establishment must be documented. The storage place and intended further use of product must be also recorded. Documentation must provide an audit trail by which product can be traced from the live animal to storage, destination and end use of the final product.

The recording system should operate from the time a vehicle enters the establishment with animals, through slaughter, processing and storage, to the time product is removed from the premises. It is important that vehicle movements are recorded for forward tracing.

A record should be kept of staff interests in animals outside the establishment. This will enable personnel who are likely to be a risk in spreading infection to other animals to be quickly identified for special advice and possible restrictions.

2.9 Water supply

Details of the water supply (its origin, storage, treatment method and quantities available) should be documented.

2.10 Wild and feral animal control

The wildlife and feral animal situation on an establishment should be investigated and documented to enable the veterinary authorities to make an informed decision on whether additional control measures will be necessary in an EAD response.

As normal management practice, the establishment should keep wild and feral animals at manageable levels to minimise the possible spread of infection during a disease emergency.

2.11 Media and public relations

The **Public Relations Manual** contains detailed information on media and public relations. Information sheets on diseases covered by AUSVETPLAN are contained in the **Summary Document**.

In conjunction with the relevant peak industry bodies, management should nominate and train a suitable person to handle media enquiries during an EAD incident. An emergency disease associated with the enterprise could have a major effect on acceptance of its product during and after the EAD response. The nominated person's comments should reflect the national arrangements, particularly in relation to the national communication network and the local disease control centre.

3 Response plans in a declared area

3.1 Introduction

This section deals with situations in which a meat processing establishment, knackery or pet food establishment, although not having any clinical or suspected cases of disease, is within a 'declared area' as a result of an emergency animal disease (EAD) outbreak elsewhere.

In an EAD response, the state or territory jurisdiction will issue a 'table of movement controls', which will detail what is or is not allowed. This should be the key reference for enterprises.

3.1.1 Declared areas

The term *declared area* is used to cover both *restricted* and *control* areas. Such areas may not necessarily be declared for all diseases, and their implementation may vary in particular situations.

A *restricted area* (RA) is a relatively small area around an infected premises that is subject to intense surveillance and movement controls. Movement out of the RA will, in general, be prohibited, while movement into the area would only be by permit. Movement into the RA of significant numbers of susceptible species is unlikely to be permitted. If a meat processing establishment were to be in an RA, it is likely that it would only be used for the slaughter of animals of a species susceptible to the disease for disease control purposes, and not to produce product for human or pet consumption. Multiple restricted areas may exist within one *control area* (CA). Guidelines for establishing restricted areas are provided in each **Disease Strategy** and in the *OIE Terrestrial Animal Health Code*.

A CA will be a buffer between the RA and areas free from disease. Restrictions in the CA will reduce the chance of the disease spreading further afield. The CA should reduce in size as the extent of the outbreak becomes clearer. In principle, animals and specified product will only be able to be moved out of the CA into the free area by permit.

The controls gazetted by the state or territory authority should be obtained from the local disease control centre (LDCC).

Copies of this gazettal and relevant permit forms are to be supplied to premises management, and copies are to be posted at suitable points on the premises for the information of staff.

3.1.2 Local disease control centre

In the event of an EAD outbreak, each state or territory is responsible for its own disease control activities under the direction of the state or territory chief veterinary officer (CVO). An LDCC will be established and will be responsible for all activities within the declared area, including disease investigation, collection of

specimens, quarantine of properties, valuation, slaughtering and disposal of livestock, and decontamination of properties.

The plant veterinarian must establish early contact with the relevant contact person in the LDCC, be aware of the LDCC's requirements, and follow its directives. The veterinarian may also be an important source of information and advice to the LDCC and, ideally, will already have been accredited as an infected premises site supervisor.

3.2 Can an enterprise in a declared area continue to operate?

It is possible that an abattoir in a declared area will continue to operate to process low-risk animals for human consumption, as a means of reducing the susceptible population in the area, and for animal welfare reasons.

For some EADs, and where the eradication program is staged over a long period, it is also possible that an abattoir will be permitted to process infected livestock for sale to markets in other infected areas.

Within a declared area, the resumption or continuation of an abattoir's operations will be at the discretion of the state or territory disease control authorities. It is likely that no movements of susceptible livestock will be permitted in the short term, but such restrictions may be eased as the disease situation is clarified. This will depend partly on the success of initial quarantine and movement controls.

Depending on the disease, slaughter of selected animals may be permitted under supervision, subject to risk assessment that takes into account the overall disease control strategy, the destination of product and market access.

Enterprises may be permitted to operate if the following are considered to be adequate to prevent the spread of disease should it subsequently be introduced:

- security measures for animals, people, products and things;
- rendering facilities;
- laundering facilities;
- effluent control facilities;
- stock-truck washing facilities;
- paved lairages; and
- supplies of hot and cold water and disinfectant.

Routine commercial operations may also be affected by:

- self-imposed quarantine;
- redirection of slaughtering capacity to depopulate high-risk properties;
- inability to satisfy disease restrictions for export requirements;
- possible restriction of marketing to the defined CA;
- difficulty in sourcing stock for slaughter (saleyards may not be operating, and buyers will be discouraged from visiting farms);

- inability of staff who have contact with other susceptible animals to come to work; and
- the location of the establishment in an area of high livestock density.

3.3 Minimisation of operational risks

In collaboration with the infected premises site supervisor, management has responsibility for ensuring the provision of sufficient personnel to control the entry of animals, people and things onto the premises. Depending on the size of the operation, two entry/exit points should be established: one for incoming livestock and another for personnel, stores, equipment and outgoing product. This is to reduce congestion at the entry points and the risk of cross-contamination. There should be only one point of entry for livestock. Entry and exit points should be clearly signposted and strictly policed to maintain separation.

The sections below outline the broad principles applicable to different diseases.

3.3.1 Live animals

The principle of separation and movement control should be applied to livestock and work animals. Livestock for slaughter should not be held for long periods. The 'just in time' principle of raw material supply should be used so that the smallest practicable numbers of livestock are held on the establishment. Accurate records should be kept of the animals' number, type, arrival time, place of housing and time of slaughter.

All stock must be accompanied by a permit issued by the LDCC. No vehicle with animals should be allowed onto the premises unless the driver presents a valid permit. If the vehicle has no permit, the LDCC should be notified immediately and the vehicle detained in an isolated area until instructions from the LDCC have been obtained.

Dogs or horses owned by stockmen should only be allowed entry if directly involved with those employees' duties, in which case the animals' admission depends on the disease involved.

An entry procedure appropriate for the disease should be established (see the **Decontamination Manual** and the relevant **Disease Strategy** for details).

Trucks should be cleaned and disinfected immediately after unloading. Standard operating procedures should be available for this and for any other tasks not routinely undertaken. Trucks should not bring dogs on to the establishment, except under special arrangements appropriate for the disease.

Live animals should be kept securely within the boundaries of the establishment, and movement between paddocks, pens or other defined areas should be strictly controlled and minimised. Close contact between animals within the establishment, and between them and animals on neighbouring properties, should be eliminated by physical separation and distance.

Animals within the establishment should not be fed any contaminated materials and should be prevented from coming into contact with effluent or byproducts from processing.

Regular and thorough veterinary observation of the animals must be conducted to detect any occurrence of the disease.

Introduction of animals for slaughter

After a risk assessment, and taking into account animal welfare issues, animals may be admitted for slaughter at an establishment in an RA or a CA, under permit and subject to the following conditions:

- Management must ensure that all issues associated with valuation and compensation are clear.
- Only animals from a herd in which no animal is showing clinical signs of the disease are to be admitted for slaughter, and normally only after the incubation period for the disease has elapsed since the last disease outbreak that caused the herd of origin to be in either a RA or CA status area. The following procedure must be followed:
 - conduct a veterinary examination of the whole herd of origin
 - if possible, test animals to be transported with a rapid screening test, such as reverse transcriptase-polymerase chain reaction (RT-PCR), to detect the presence of antigen for the disease (to minimise the risk of animals being transported during the incubation period);
 - individually identify all animals to be transported (eg by National Livestock Identification Scheme tail tags with serial numbers or ear tags and tattoos, or as determined by an authorised officer);
 - re-examine animals to be transported immediately before travel using a physical examination appropriate to the disease;
 - in the case of a vesicular disease, record temperatures, and examine the tongue, mouth, feet, udder and teats; and
 - document times of examinations, findings and the results of any tests.
- Slaughtering establishments must have a rendering plant.
- Truck drivers must wear protective clothing and rubber boots, which will be disinfected. Handwashing facilities must be provided for truck drivers.
- Transport vehicles must be certified to have been cleaned and disinfected (see the **Decontamination Manual**) immediately before they enter the farm of origin and after they are unloaded at the abattoir. Every effort must be made to contain spillage of urine and faeces during transit to the abattoir. This could be achieved by vehicle design and by taking stock off feed and water for the appropriate period before travel.

- The vehicle's wheels and undercarriage must be certified to have been cleaned immediately before the vehicle left the farm.
- Livestock trucks must travel under seal or be accompanied by a government officer.
- Animals must be placed in paved lairages, either the night before or on the day of slaughter.
- Animals in the lairages must be completely killed out each day.
- Emptied yards must be disinfected on a daily basis after kill.
- In association with the veterinary authorities, establishments will need to make arrangements to provide the following veterinary inspections, which will have a particular emphasis on looking for clinical signs of the EAD in question:
 - antemortem examination, to be carried out both on arrival and immediately before slaughter, with a particular emphasis on looking for clinical signs of the EAD in question; and
 - postmortem examination, with particular emphasis on the postmortem signs of the disease.
- Animal identification records must be maintained so that kill sheets indicate the property of origin and identity of each carcass.
- Slaughter should be carried out in property-of-origin lots.
- Appropriate cleaning and disinfection is to be performed daily.
- Working animals (such as dogs and horses), feral animals, rodents and insects should be strictly controlled.
- Effluent must be controlled. Depending on the disease:
 - effluent must not be sprayed onto paddocks or pastures; and
 - effluent must be decontaminated before release (see the **Decontamination Manual**).
- Animals on the farm of origin will be monitored for a number of days (which will depend on the incubation period of the disease) after the slaughter animals have left the farm:
 - Product will not be released until the surveillance period has elapsed.
 - If disease appears on the farm during this period, carcasses and their parts originating from the farm will be condemned and disposed of by burning, burying, rendering or as appropriate.
- Extra requirements apply for particular diseases, details of which are in the relevant **Disease Strategy**. For example, in the case of foot-and-mouth disease,

carcasses would have to hang for a minimum of 24 hours at 2°C and achieve a pH of less than 6; boning would follow, with complete removal and safe disposal of all lymph nodes, blood clots and bones; no offal could be salvaged, as it does not undergo rigor mortis and subsequent reduction of pH to inactivate the virus.

- If the slaughter of infected or in-contact animals is permitted, only slaughterers, stock handlers, inspectors and veterinarians with no outside contact with susceptible stock should be involved. This can be managed in various ways; for example, personnel can be accommodated at a single place in an urban area with no susceptible livestock.
- After boning, cuts of meat must only be sold in forms permitted in the relevant **Disease Strategy** – for example, chilled, cured to specifications that destroy the disease agent, or cooked.
- Any meat that has already been frozen must be held under security for a judgment on its disposition, which may involve further processing, such as cooking. A system of seals or locks, documentation and inventory control will be needed to achieve this.
- Workers must undergo an appropriate decontamination procedure at the end of each day's operation. Movement controls are likely to require a register of staff in and out.
- The establishment will be subjected to thorough cleaning and disinfection.

3.3.2 Animal products

Entry of animal product will be subject to controls similar to those on live animals, with vehicles undergoing a disinfection procedure appropriate for the EAD and the circumstances of the outbreak. Movement within the declared area will be subject to approval, and entry and unloading will only be permitted on presentation of a valid permit. Requirements for each disease can be found in Appendix 2 of the relevant **Disease Strategy** and in the OIE Terrestrial Code.

Control of inventory is essential. Well-maintained records should detail what is produced, the date and batch of production, the place and manner of storage, and the product's destination after it leaves the premises. Abattoirs should have an effective system to identify the origin of a batch of product. Product should be stored securely to prevent pilfering, intentional tampering, unauthorised contact by humans, and contact by vermin or other animals.

Carcases and their parts should only be introduced for further processing from abattoirs that have satisfied all the conditions in Section 3.3.1, relevant to the particular disease.

Depending on the disease agent involved, other conditions to be met may include the following:

- Carcasses are to be introduced chilled, not frozen.
- During boning, all bones and trimmings are to be controlled to ensure that all lymphatic tissue has been removed.

- Rendering is to be at the required temperature and other parameters. This may involve transfer to a rendering plant under security, and rendering under supervision.
- An identification system is to be in place to correlate all product with its farm of origin. In this way, all product may not have to be condemned if disease occurs on one of the source properties.
- Subject to scientific risk assessment, product may or may not be permitted to be sold in particular forms (eg chilled or cooked).
- Frozen boneless meat is to be processed in a way that inactivates the disease agent, and the plastic wrapping and/or cardboard boxes used for its storage are to be disposed of by burning or burying.
- For the nominated period after contact with product (eg 3 days in the case of foot-and-mouth disease), workers should have no outside contact with susceptible animals.
- Workers are to undergo an appropriate decontamination procedure after each day's operations.
- If the disease is zoonotic (ie can infect humans), staff may need health screening.

All product produced by the enterprise before declaration of the EAD but within the disease's incubation period should be considered as priorities for tracing. If possible, product produced during the critical period should immediately be identified, separated from other product, and protected from possible contact with the disease agent (for example, protection against aerosol spread of foot-and-mouth disease virus might include full packaging and overwrapping of pallets).

No attempt should be made to transport any goods without first contacting the LDCC and, in the case of potential exports, the Australian Quarantine and Inspection Service (AQIS), to obtain the necessary permits.

3.3.3 Treatment of product

Chemicals

Chemicals used as preservatives in meat can inhibit or kill spoilage organisms, but they cannot be relied on to kill EAD pathogens. For example, while it has been documented that foot-and-mouth disease virus will not survive in certain types of sausage, this cannot be regarded as a dependable method of decontamination (Savi et al 1962). Other chemicals, such as caustic soda, while used for decontaminating work surfaces, are not suitable for decontaminating edible product and may not be effective for inedible product.

Irradiation

Decontamination of product by irradiation is effective but is not a viable option, as there are no plants with adequate facilities to carry out a large-scale operation. In addition, there is consumer resistance to the use of irradiation for edible product.

Heat treatment

Heat treatment of product effectively destroys some types of pathogen, but it is difficult to reliably heat all parts to the required temperature for the necessary time, which may also affect the saleability of the product for human consumption.

3.3.4 Animal byproducts

Rendering

The biological hazards that may be present in raw material to be rendered include vegetative bacteria, spore-forming bacteria, moulds, viruses and the infective agents for the transmissible spongiform encephalopathies (TSEs), including those that cause scrapie and bovine spongiform encephalopathy (BSE).

Vegetative bacteria and viruses are readily killed by standard rendering time or temperature regimes, but spore-forming bacteria are more heat resistant.

Rendering systems in Australia must be validated annually to demonstrate that the heat treatment will eliminate *Clostridium perfringens*. Such systems can be expected to eliminate other spore-forming organisms.

In the European Union (EU), the minimum rendering conditions for mammalian material are a core temperature of at least 133°C for 20 minutes at a pressure of 3 bar (absolute), with a maximum particle size of 50 mm (System A in Appendix 4). These conditions have been shown to reduce TSE infectivity by more than 10^{2.8} ID₅₀ per gram, but cannot be relied on to eliminate all TSE infectivity.

Very few rendering plants in Australia are able to render to the EU standard for mammalian material, which is designed to address possible contamination of the raw material by the BSE agent. The EU will accept other heat treatment systems for nonmammalian material, provided that product sampled daily over a trial period of one month is free from heat-resistant pathogenic bacterial spores (*Clostridium perfringens* absent in 1 g). Routine samples of meatmeal taken during or on withdrawal from storage must be free from salmonella in 25 g. The number of enterobacteria must not exceed 300 in any one of five subsamples; two subsamples may have counts up to 300, provided the other three do not exceed 10 organisms.

In continuous wet rendering systems (System C in Appendix 4), raw material is initially heated to about 95°C and held for 20 minutes or more. The cooked material is then defatted and dewatered by pressing. The defatted wet solids are dried in an indirect steam-heated drier. The material in the drier is in contact with steam-heated discs at up to 170°C, but the temperature of the material does not usually exceed 110°C at the end point. The material is in the drier for 1 to 2 hours. This type of rendering system has been shown to reduce BSE infectivity by more than 10^{1.4} ID₅₀ per gram. It is probably capable of eliminating most bacterial endospores and reliably eliminates viruses and bacterial cells.

Other continuous wet rendering systems (System D in Appendix 4) use direct-fired hot-air driers to dry defatted wet solids. These systems have been approved by the New Zealand Ministry of Agriculture and Fisheries as providing a sterilisation effect equivalent to 121°C in steam for 15 minutes, but it is difficult to control the conditions as specified by that authority. These systems have not been challenged with BSE infective material, and their ability to reduce BSE infectivity is not

known. They are able to eliminate bacterial endospores, provided suitable heat conditions are maintained. They reliably eliminate bacterial cells and viruses.

In batch and continuous dry rendering systems (Systems A and B in Appendix 4), the fat is removed by centrifugation (extractors) or pressing (expellers) after most of the water has been evaporated from the material. Fat extraction must be carried out with the correct amount of residual water in the charge, or fat removal is impaired or impossible. Batch dry-rendering systems operated according to the EU heat treatment for mammalian material provide reliable sterilisation for microbial hazards. Batch and continuous dry-rendering systems without pressurisation are capable of eliminating most bacterial endospores and reliably eliminate bacterial cells and viruses. Neither system can eliminate all TSE infectivity, and any material potentially contaminated with a TSE agent would be incinerated and not released to industry.

The rendering systems and time-temperature-pressure regimes that are required to inactivate various EAD pathogens for various diseases, and actions to be taken, are outlined in Appendix 4.

Hides and skins

Hides and skins may transmit some pathogens, such as those causing lumpy skin disease and sheep pox and goat pox.

3.3.5 Effluent

Effluent must be retained for appropriate treatment, and any unintentional discharges of effluent should be identified and controlled as quickly as possible. Discharges should be classified according to their potential for spreading infection, and control plans should be made accordingly, taking into account prevailing environmental conditions. The aim is to prevent the exposure of susceptible animals to contaminated effluent.

3.3.6 Vehicles

Vehicles entering the premises should not come into contact with animals already on the premises. Vehicles should not have to be driven through any potentially infective discharges, but if this happens they must be cleaned and disinfected according to the requirements for the particular disease before being allowed to leave the premises (see the **Decontamination Manual**). A management plan (covering, for example, maintenance and refuelling) may be needed for vehicles that remain on site. The route taken into and out of the abattoir by waste management transport, and its subsequent destination, will have to be carefully planned.

3.3.7 Equipment and materials

Stores are either inanimate (such as disinfectants, packaging materials, petrol, oils and equipment) or contain animal material (such as canteen supplies). Inanimate stores will require minimal control provided they are new and correctly packed. Vehicles carrying these supplies must undergo the established entry procedure, preferably through an entry point separate from livestock carriers (see Section 2.5). Management should ensure that deliveries are received directly from wholesalers and not after deliveries to farms, as could occur with fuel.

Materials and equipment must be kept secure from unauthorised use, pilfering, and unauthorised contact with persons or animals.

Equipment or materials should not leave the premises without having been decontaminated in the manner appropriate for the disease.

Animal feedstuff required by the abattoir must not be a source of further infection.

Canteen supplies should be supplied from wholesalers as packaged product, to avoid direct farm-to-premises contact.

3.3.8 Personnel

Personnel, through management, should be kept informed of the nature of the disease, its risks to them and to the animal population, the need for changed practices and security, the role they have to play in preventing the spread of the disease and the practical details of what they have to do.

All people on the premises should be supplied daily with clean work clothing, headgear and rubber or plastic boots. These should be worn while on the premises. A secure area for personal equipment, such as knives, steels and scabbards, should be provided so that they are not taken home each day where this has been the practice.

Nonessential movement between work sections should be avoided. Tasks and movement should be allocated on a 'need to do' basis. Only those who need to be in an area or who need to do a particular task should be in that area or performing that task. 'Clean' and 'dirty' (ie potentially infective) areas will be established, with controlled perimeters and differing restrictions on personnel movement.

The likelihood of contact between personnel and susceptible animals outside the premises must be determined and alterations to their circumstances considered. Dogs or horses belonging to stockmen will have to be dealt with on an individual basis, depending on the risk they pose through contact with stock outside the premises. In some cases, it may be necessary to provide kennelling or stabling on site.

3.3.9 Visitors and service personnel

Only people having bona fide business on the premises should be allowed entry. Arrangements for escorting such visitors should be instituted to ensure that they only enter areas relevant to them and that they undergo suitable disinfection on leaving those areas. Conditions of entry should be explained to visitors, and name tags identifying them should be supplied at the point of entry. Only essential equipment should be taken onto the premises, in order to minimise the disinfection requirements on exit.

3.3.10 Vermin and feral animals

The control of vermin and feral animals must be upgraded where they are relevant to the EAD outbreak. Any possible sheltering or breeding areas for vermin should be eliminated by keeping long grass mown. Proper storage, disposal of garbage and appropriate pest control measures should already be in place.

3.3.11 Buildings and structures

Buildings and structures will need to be able to be cleaned and disinfected as appropriate for the disease threat. Where high protein and fat content of meat products is involved, and for certain types of operation, special cleaning techniques will be required before disinfection is applied.

Yards and pens will be grossly contaminated with faeces and soil. This will need to be collected as effluent or solid waste and subjected to treatment (see the **Decontamination Manual**).

Approval to continue to operate in a declared area may depend on the establishment having the ability and resources to clean its buildings and other structures.

4 Response plans in an infected or dangerous contact premises

4.1 Introduction

This section addresses the situation in which a meat processing establishment, knackery or pet food establishment contains infected animals or product from an infected premises (IP) and is therefore itself an IP, or contains animals or product from a dangerous contact premises (DCP) and is therefore a DCP.

Declared areas, proclaimed by the state/territory chief veterinary officer (CVO) or their delegate in the event of an emergency animal disease (EAD) outbreak, are of three types: *infected premises* (IP), *dangerous contact premises* (DCP) and *suspect premises* (SP). For definitions of these terms, see the Glossary.

IPs, DCPs and SPs are declared in accordance with the relevant **Disease Strategy** in order to minimise the spread of disease.

The EAD response will vary according to the particular disease. The descriptions below relate to an outbreak of a highly contagious disease, such as foot-and-mouth disease, that would require complete decontamination of a premises. For diseases that are not transmitted by indirect contact, the implications would be less severe.

4.2 Can the enterprise continue to operate if declared infected?

An establishment may be deemed infected if:

- diseased animals are found in the lairage;
- lesions are recognised in slaughtered animals; or
- trace-back or trace-forward procedures show that the establishment contains animals or product from an IP.

State or territory authorities must be contacted immediately an EAD is suspected. The state CVO will take charge of eradication operations.

The premises will be quarantined, with restrictions imposed on the movement on to or off the premises of all susceptible animals, livestock products and things. Advice should be given to members of the public on site at the time of the declaration, and information needs to be sent to contractors who have been on site.

4.3 Elimination of the agent

The aim of an eradication program is to:

- stop production of the disease agent;
- prevent spread; and
- decontaminate to destroy the agent.

The operational aspects of the destruction of livestock and the disposal of carcasses are addressed in the **Destruction Manual** and the **Disposal Procedures Manual**.

4.3.1 Stamping out/destruction of animals

Decisions about destruction of animals will be made by the regulatory authorities, in accordance with the relevant **Disease Strategy**. For most serious EADs, infected or dangerous contact animals will be destroyed and disposed of by burning or burying. Rendering may be an option in certain circumstances, and the resulting product may be permitted for disposal as fertiliser.

If the location of the enterprise makes on-site disposal inappropriate, carcasses may be able to be taken to an alternative site, provided that site and the route taken to it do not pose an unacceptable risk to susceptible animals and provided the vehicles and personnel involved are decontaminated. Personnel involved in these activities must not come into contact with any animals susceptible to the disease in question.

The local disease control centre (LDCC) will directly oversight and advise on these actions.

Records must be kept for valuation and compensation.

4.3.2 Salvage of animals or product

Product obtained from animals during the critical period should be destroyed, unless:

- the **Disease Strategy** states that the animal product is not a risk;
- the system of livestock and product identification is such that product can be traced to property of origin and the property is found to be free from disease;
- the processing method is approved as one that will destroy the infectious agent; or
- epidemiological investigations indicate that the animals were not infected (that is, they were not from an IP or could not have been infected by diseased animals).

Product from noninfected animals may be permitted to be salvaged following a risk assessment:

- by a processing method approved as one that will destroy the pathogen; and

- if the inventory control and tracing systems are such that product can be traced to animals that are not infected.

4.4 Decontamination

The operational aspects of decontamination are addressed in the **Decontamination Manual**.

In general, the principles and methods used for decontamination during an EAD response will be the same as those routinely applied in meat processing establishments (including fogging). The main concern is to ensure that the chemicals used are appropriate for the disease agent and that they comply with the Instrument of Approval and the Material Safety Data Sheet for use in an abattoir, if the establishment is permitted to remain operational. Decontamination may be required twice, with a specified period (eg 21 days) in between.

Clean-down procedures for knackereries, game meat and pet food establishments must be undertaken to the same standards as are applicable to any other meat processing establishment.

Although procedures will vary according to the disease involved, they will include:

- a thorough clean-down, with all effluent treated or appropriately handled before its discharge into the environment;
- a decontamination program, ensuring that all organic material is removed;
- treatment or removal of all product; and
- if necessary, a plan for the use of sentinel animals.

Clean (unlikely to be infected) and *dirty* (potentially or actually infected) areas will need to be established, with controlled perimeters and differing restrictions on personnel movement. 'Clean' and 'dirty' are likely to be officially defined for some diseases.

Each plant should have its own contingency plan, developed in accordance with the relevant AUSVETPLAN manuals. In an EAD response, the decontamination program should be determined after close consultation between the Australian Quarantine and Inspection Service (AQIS), the on-plant veterinarian (or equivalent) and the LDCC controller (or delegate).

4.4.1 Livestock

Depending on the specifications in the relevant **Disease Strategy**, slaughter and disposal of all livestock on the establishment may be required. Repopulation may be delayed pending appropriate decontamination and approval. Repopulation with sentinel animals may be required before resumption of normal production to assess the effectiveness of the decontamination procedures. Records must be kept for valuation and compensation.

4.4.2 Products and byproducts

Destruction and disposal or treatment of products and byproducts (skins, hides, hoofs, horns, animal protein, etc) should meet the specifications in the relevant **Disease Strategy**. This may involve disposal, treatment, separation and isolation for a period, or no restrictions whatsoever.

4.4.3 Discharges

To reduce water usage and help to prevent the escape of liquid effluent, an initial cleaning procedure for the site (scraping away organic material) should be followed by cleaning with water; however, water usage should be minimised because the water itself must then be handled to prevent it transmitting disease. This is followed by decontamination of the site, disinfection, and treatment and disposal of the dry material.

Depending on the disease, the effluent may have to be contained and treated before being discharged normally or in such a way that it will not come into contact with susceptible animals. Environmental regulations must be complied with.

4.4.4 Vehicles

Vehicles should not be driven through any discharges from lairages or processing premises. On-site vehicles should be kept separated from off-site vehicles.

Before being allowed to leave the premises, vehicles should be cleaned and disinfected according to the requirements for the disease. In general, service vehicles that do not come into contact with infected or suspect areas should only require cleaning of wheels – a drive-through wheel wash may be suitable.

Any vehicle carrying livestock or animal product will require complete cleaning and disinfection.

Planning should be in place for cleaning and disinfecting emergency vehicles, such as ambulances.

4.4.5 Equipment and materials

Equipment and materials that may come into contact with infected animals, products, byproducts or discharges should be handled according to the relevant **Disease Strategy**.

The nature of the meat processing industry, the type of product and the amount of hot water used means that equipment and materials may be highly contaminated with protein and fat. Great care is required to ensure adequate cleaning.

4.4.6 Personnel

A short information sheet, written in simple language, should be provided to personnel, detailing actions required of them during the EAD outbreak. This may be reinforced by conducting a general meeting and discussion, at which a relevant EAD video is shown to personnel and questions are answered by members of the LDCC and by the establishment veterinarian, if one is present. Additional training and supervision may be necessary.

Clean (ie unlikely to be infected) and *dirty* (ie potentially or actually infected) areas will need to be established, with controlled perimeters and differing restrictions on personnel movement. 'Clean' and 'dirty' are likely to be officially defined for some diseases.

Personnel must wash and change into clean clothing before leaving the premises, and dirty clothing must remain on the premises.

All people associated with the investigation of the EAD situation must take all necessary decontamination precautions before leaving the premises. High-risk personnel may need to be accommodated in a 'safe' place (for example, in a town away from livestock).

4.4.7 Vermin and feral animals

Control of vermin and feral animals is important in a normal operational sense for meat processing enterprises, but is particularly important in the control of many EADs, which may be transmitted by those animals. The individual **Disease Strategies** note the importance of vermin and feral animals for each disease.

Feral animals susceptible to a particular disease may play a role in spreading the disease from a meat processing enterprise to outside sources if they are able to gain access to waste materials, live animals, discharges or product.

If controls are not already in place, a program will need to be developed to ensure that vermin and feral animal control is a part of the establishment's operations, and is effective.

4.4.8 Buildings and structures

Permission to continue to operate a meat processing enterprise that has been declared an IP will depend largely on the types of buildings, structures, yards and storage areas in the establishment, and especially on the ability to effectively clean and disinfect the establishment. The type of enterprise and the products handled may make cleaning difficult and tedious, in which case greater attention is required.

A period may be specified during which the facility must be vacant, as some types of disease agent die off naturally over time.

4.5 Other precautions

The management of an enterprise that has been declared an IP or DCP will need to take additional measures and introduce stricter supervision and record keeping if the enterprise is to be permitted to operate. Contingency plans must be available and familiar to staff, and must be able to safely direct the activities of the employees to prevent further spread of disease.

4.6 Tracing requirements

4.6.1 Tracing livestock

All stock entering abattoirs for slaughter should be identifiable to property of origin through National Livestock Identification Scheme (NLIS) numbers, tattoos, ear tags or some form of identification, with documentation as required by state or territory authorities.

During an EAD response, a veterinary officer or inspector will examine the animals and documents to determine which lots are at risk. Records should be made of all NLIS numbers, ear tags or other identifications on the animals. Any documents, such as national vendor declarations, waybills or the like, should be examined to obtain names of owners, carriers (vehicle registration numbers), agents and routes of travel. This information should be provided to state or territory authorities, who will use it for tracing stock to property of origin (through ANEMIS, the Animal Health Emergency Information System) and to identify possible contacts.

Other issues to be considered are:

- infected animals, alive and dead (including dead in yards);
- in-contact animals on the premises;
- in-contact animals on neighbouring properties;
- horses and dogs belonging to stock handlers;
- animals off premises, including pets, owned by people in direct contact;
- animals off premises, including pets, owned by people not in direct contact; and
- any animals that may have transited through the premises to another destination.

Documentation covering the arrival of stock must comply with state or territory requirements and be retained by management in a system that allows correlation of stock with product batches.

The receipt system at the abattoir should be implemented so that the information listed in Appendix 5 is recoverable. Tracing systems available in two states are provided in Appendix 5.

4.6.2 Tracing product

It will be necessary to trace product in chillers or freezers if trace-back reveals that the product is or might be contaminated with the disease agent.

Products that need to be considered for tracing purposes include:

- meat (chilled, frozen, bone-in, boneless)
- offal
- processed and cooked products

- canned product
- pet food
- pharmaceuticals
- blood
- hides
- tail pieces
- horns
- tallow
- meatmeal
- paunch screenings, manure and fertilisers
- bile
- gallstones
- foetal blood
- slink skins
- bones and fat sent off the premises for rendering
- biological specimens for schools and universities
- casings
- calf vells
- souvenirs, such as ear tags
- scrotums for lining 'stubby' holders
- used wrappers and cartons.

The product must be able to be traced to:

- storage establishments/container terminals
- further processing establishments
- retail outlets
- exporting vessels
- overseas countries
- local butcher shops
- homes of staff who have obtained product directly from the plant.

In some abattoirs, cartoned product can be correlated with the kill sheet. Meat transfer certificates, notices of intention, and health certificates and certification covering inedible product will be used for tracing product and the notification of overseas countries that import Australian products.

Because Australia may seek recognition for regional disease freedom, it will be important to be able to recognise the origins of all product in transit. Only one state or territory, or part of a state or territory, might be affected if it could be proven that the disease was only in that jurisdiction and that Australia had effective controls to ensure that the disease would not spread further.

Systems should be in place at beef-producing establishments to enable identification of product from tail tags in yards to cartons, quarters, etc. Such a system can prove useful when resolving a nonemergency issue, such as a residue violation, or tracing an endemic disease with public health or trade implications. In an EAD response, the system may enable the saving of unaffected product that would otherwise have to be destroyed because of its unknown disease status.

Tracing information will be forwarded to the LDCC for recording on the ANEMIS system.

4.7 Proof of freedom

Proof of freedom from disease must meet both Australian veterinary requirements and relevant OIE provisions.

Official certification for both domestic and export movement may require the establishment of proof of freedom on a country or regional basis.

More disease-specific information on proof of freedom is available in the individual **Disease Strategies**.

4.8 Media and public relations

The enterprise must liaise closely with its clients to keep them informed of the situation and any restrictions on its operational status, stock, people and vehicle movements, and documentation requirements.

Maintaining an appropriate channel of communication with the media is an important function of the LDCC. However, it is difficult if information coming from elsewhere appears to conflict with advice given by the LDCC. Advice to the media from the enterprise should be restricted to activities directly affecting the enterprise. General enquiries about the particular disease or the control activities that are being undertaken in the area must be directed to the Public Relations Unit in the LDCC. For further information, see the **Public Relations Manual**.

Appendix 1 List of diseases covered by the Emergency Animal Disease Response Agreement of March 2002

Table A1.1 Summary of diseases covered under the EAD Response Agreement^a

Disease	Category	Agent	Human health risk	Main species affected
African horse sickness	3	V	Nil	Horses, dogs
African swine fever	3	V	Nil	Pigs, warthogs
Anthrax (major outbreaks)	3	B	Yes	All mammals
Aujeszky's disease	4	V	Nil	Pigs, cattle, sheep, goats, dogs
Australian bat lyssaviruses	1	V	Yes	Flying fox, insectivorous bats
Avian influenza (highly pathogenic)	3	V	Strain dependent	Poultry
Bluetongue (disease in sheep)	3	V	Nil	Sheep, goats, cattle, buffaloes, camels, antelopes, deer
Borna disease	4	V	?	Horses, sheep
Bovine spongiform encephalopathy	2	Prion	Yes	Cattle, cats
Bovine tuberculosis (due to <i>Mycobacterium bovis</i> , after Tuberculosis Freedom Assurance Program [TFAP2] is completed)	3	B	Yes	Cattle, buffalo, deer, camelids, rhino, elephants, giraffe
Brucellosis (due to <i>Brucella abortus</i>)	2	B	Yes	Cattle, horses
Brucellosis (due to <i>Brucella melitensis</i>)	2	B	Yes	Goats, sheep
Classical swine fever	3	V	Nil	Pigs
Contagious bovine pleuropneumonia	3	M	Nil	Cattle
Contagious equine metritis	4	B	Nil	Horses, donkeys
Dourine	4	P	Nil	Horses
East coast fever	4	P	Nil	Cattle
Encephalitides (tick-borne) [Louping Ill]	3	V	Rare	Sheep, cattle, horses, pigs, deer
Epizootic lymphangitis	4	F	Rare	Horses
Equine babesiosis	4	P	Nil	Horses, donkeys, mules
Equine encephalomyelitis (Western, Eastern and Venezuelan)	1	V	Yes	Horses, donkeys, mules, poultry, emus
Equine encephalosis	4	V	Nil	Horses
Equine influenza	4	V	Rare	Horses
Foot-and-mouth disease	2	V	Rare	All cloven-hoof animals, elephants
Getah virus	4	V	Nil?	Horses (humans, monkeys, cattle, buffalo, goats, dogs, rabbits, fowl, heron — can be infected subclinically)
Glanders	2	B	Yes	Horses, donkeys, mules, cats, dogs
Haemorrhagic septicaemia	4	B	Nil	Buffalo, bison, cattle
Heartwater	4	R	Nil	Cattle, water buffalo, sheep, goats

Disease	Category	Agent	Human health risk	Main species affected
Hendra virus	2	V	Yes	Horses
Infectious bursal disease (hypervirulent form)	4	V	Nil	Poultry
Japanese encephalitis	1	V	Yes	Pigs, horses
Jembrana disease	4	V	Nil	Bali cattle
Lumpy skin disease	3	V	Nil	Cattle, buffalo
Maedi-visna	4	V	Nil	Sheep, goats
Menangle virus (porcine paramyxovirus)	3	V	Yes	Pigs, flying foxes
Nairobi sheep disease	4	V	Yes	Sheep, goats
Newcastle disease	3	V	Rare	Poultry
Nipah virus	1	V	Yes	Pigs, flying foxes (dogs, cats — cannot be excluded as sources of infection)
Peste des petits ruminants	2	V	Nil	Sheep, goats (cattle, pigs — might possibly be affected, either subclinically or very mildly)
Porcine reproductive and respiratory syndrome	4	V	Nil	Pigs
Potomac fever	4	R	Nil	Horses
Pulmonary adenomatosis	4	V	Nil	Sheep, goats
Rabies	1	V	Yes	All mammals
Rift Valley fever	2	V	Yes	Cattle, sheep, goats, dogs
Rinderpest	2	V	Nil	Cattle, sheep, pigs
Scrapie	3	Prion	Nil	Sheep, goats
Screw-worm fly	2	P	Yes	All mammals
Sheep pox and goat pox	2	V	Nil	Sheep, goats
Sheep scab	4	P	Nil	Sheep
Surra	4	P	Nil	Horses, cattle, deer, camelids, dogs, cats
Swine influenza	4	V	Yes	Pigs, birds, humans, dogs, cats
Swine vesicular disease	3	V	Nil	Pigs
Teschen disease	4	V	Nil	Pigs
Transmissible gastroenteritis	4	V	Nil	Pigs, dogs
Trichinosis	3	P	Yes	All mammals
Vesicular exanthema	3	V	Nil	Pigs
Vesicular stomatitis	2	V	Yes	Cattle, horses, pigs, sheep, goats
Wesselsbron disease	4	V	Yes	Sheep, goats, humans

B = bacterium; F = fungus; M = mycoplasma; P = parasite; R = rickettsia; V = virus

a Information about the EAD Response Agreement can be found in the Summary Document and at <http://www.animalhealthaustralia.com.au/programs/eadp/eadra.cfm>

Appendix 2 Procedures for key roles

The following are general procedures that need to be considered in the event of an EAD affecting the operations of a meat processing enterprise. Each plant should develop its own detailed contingency plan before an outbreak. Where a veterinarian is stationed at a plant, they should develop the plan in collaboration with plant management.

Preparation

The plant veterinarian must ensure that an up-to-date list of contact addresses and after-hours phone numbers of the senior inspection staff is permanently displayed in a prominent place in the inspection staff offices. In addition, the list must include the appropriate telephone contact numbers for the nearest state veterinary officer, AQIS and the Disease Watch Hotline (1800-675-888).

Management, in consultation with the plant or circuit veterinarian, must also draw up a site plan as part of the establishment response plan, showing:

- all neighbouring properties and type of animals present, if any;
- waterways, drainage, etc; and
- fencing, gates, roads, etc.

A plan of the establishment should be attached, identifying yards, freezers, cold stores and other features of interest, such as entry/exit points for personnel and vehicles.

For this appendix, procedural activities are divided into the following stages of activation for the establishment (note that similar stages of activation will apply to the response as a whole):

1. Investigation
2. Alert
3. Operational
4. Resumption of slaughter
5. Operating in a declared area.

1 Investigation Phase

Any person suspecting an EAD, either on the slaughter floor or in the yards, must immediately notify the plant veterinarian or, in the absence of that officer, the senior meat inspector. In abattoirs operating under a quality assurance arrangement with no government officers on site, the responsible company employee must be notified; that employee must immediately notify the state authority.

The veterinarian or the most senior meat inspector on site will be responsible for advice to the state or territory veterinary authorities, and will also facilitate communications with management and on-site personnel.

State and territory staff are responsible for quarantine, tracing procedures and overall disease control.

Plant veterinarian (or delegate) action list

- a) Carry out a thorough clinical examination of the suspect animal(s) in the suspect pen crush. In the case of a slaughtered animal, take all practical steps to recover any identifying tags, skin, hide or other parts that have been removed and examine all available organs and tissues. Record details of lesions. Keep lesioned tissues for examination and possible sampling by state/territory authorities. Records, especially photographic records, should be made where possible; digital images can be readily shared with relevant experts.
- b) Have a meat inspector or responsible plant employee check on the number of animals in the lot or the number that have come from the same owner, noting the name and address of the owner, what transport was used for these animals, and total numbers of animals on the premises. This information will be used in the Animal Emergency Management Information System (ANEMIS).
- c) Immediately contact the local state/territory veterinary authorities or, if they are not available, the chief veterinary officer or delegate (the Disease Watch Hotline could be used – 1 800 675 888), and provide all details collated. Notify the area technical manager (ATM) at AQIS.
- d) After discussion with the state/territory veterinary authorities and ATM AQIS, warn management of the possibility of a need to stop the kill and halt all movement into, out of and within the works. Loaded stock and meat products should remain on vehicles until inspected by a veterinarian or delegate. Ensure that accurate information is given to management, stressing the seriousness of the situation.
- e) Liaise with and follow the directions of the state/territory veterinary officer.

2 Alert Phase

The state or territory veterinary officer or the Commonwealth veterinary officer, shall, if the suspicion of an EAD is confirmed, immediately notify the state or territory CVO. The CVO will then immediately dispatch a diagnostic team for a detailed investigation.

Plant veterinarian action list

- a) Instruct management to refer to its code (the reference manual used by abattoir management), so that staff will be fully aware of their responsibilities.
- b) Where necessary, order the cessation of any further slaughtering, and of processing other than that necessary for the inspection of carcasses of animals that have already been slaughtered. If possible, place extra inspectors or company staff at points on the chain where suspect lesions can be detected before their removal. The chain speed may need to be slowed.

- c) Isolate all animals on the premises that are suspected to be infected or that may have had contact with suspect animals. The isolated animals must be placed either into lockable pens or under the control of AQIS or management personnel.
- d) Clinically examine all further suspect animals, including those remaining from slaughtered groups. Record details of clinical signs, lesions, numbers of affected animals and their origin. Collect all appropriate specimens.
- e) Segregate any dressed carcasses that have not been exposed to suspect stock.
- f) Segregate all suspicious or exposed carcasses, and those slaughtered after them, in a sealed chiller. Segregate the corresponding offal and, if possible, hides and other retained material. Where body parts (eg feet) cannot be positively correlated, a sufficiently large batch should be held.
- g) Instruct the senior meat inspector or responsible company employee to isolate that day's kill and, where practicable, lock and seal all chillers, freezers and other storage areas. Instruct the senior meat inspector to establish control over all carcasses, byproducts, offal, bulk trimmings, blood, hides and any other possibly infected material. Prevent access to those products by unauthorised personnel.
- h) Ensure that all dogs and working horses present on the establishment are properly restrained.

Plant manager action list

- a) Refer to the abattoir code to check on responsibilities. In consultation with the plant veterinarian or other appropriate government official, prioritise actions after a risk assessment.
- b) Organise a gatekeeper to maintain a record (names, addresses and telephone numbers) of all visits and departures of personnel as directed by the veterinary authorities. A record is also to be maintained of whether visitors or personnel own or are in contact with susceptible animals outside the abattoir. Vehicles leaving the premises, including those owned by employees, should be cleaned and disinfected, paying particular attention to the tyres.
- c) Where necessary, facilitate the cessation of any further slaughtering, and of processing other than that necessary for the inspection of carcasses of animals that have already been slaughtered.
- d) Ensure that senior staff help government officials to maintain control over all carcasses, byproducts, offal, bulk trimmings, blood, hides and any other possibly infected material by preventing access to those products by unauthorised personnel.
- e) Keep the employees advised and occupied to lessen their inclination to leave without clearance (videos could be used). Liaison with unions, workers associations and visitors is recommended.

Stockyards manager action list

- a) Under the direction of the inspection staff, isolate all animals on the premises that are suspected to be infected or that may have had contact with suspect animals.
- b) Liaise with the chief engineer to ensure adequate disposal of all wastewater. All stock should be denied access to such water, and it should not be used for irrigation.
- c) Ensure that all dogs and working horses in the stockyards area are properly restrained.
- d) Brief stock-truck drivers on cleaning and disinfection and standstill requirements, after being given this information by the veterinary officer.
- e) Ensure that good animal welfare standards are maintained, in consultation with the plant veterinarian or inspector.

3 Operational Phase

Infected premises site supervisor action list

If an EAD is confirmed on the premises, the LDCC, in liaison with AQIS, will appoint an infected premises site supervisor (IPSS) who will take the following action:

- a) If it has not already been done, serve a written quarantine notice on the premises. This will cover all animals, product, people and things (including grossly contaminated vehicles) that will be subject to meeting conditions before moving off the premises.
- b) Liaise with management to restrict access to and from the establishment to one point, or at the most two points, and to prevent the movement of all unauthorised animals, vehicles, things and people.
- c) Liaise with management and the LDCC to provide a gatekeeper to maintain a record (names, addresses and telephone numbers) of all visits and departures of personnel and contacts with animals outside the abattoir. Vehicles leaving the premises, including those owned by employees, should be disinfected, paying particular attention to tyres.
- d) Notify the LDCC of all personnel who own or care for susceptible livestock.
- e) If it is in accordance with the **Disease Strategy**, under direction, arrange for all susceptible animals held on the premises to be killed immediately. For rapid destruction, kill in accessible areas for ease of removal for disposal, rather than using the knocking box. However there may be situations in which it is preferable to kill animals through the knocking box.
- f) If it is in accordance with the **Disease Strategy**, when the collection of the required specimens from all suspect animals has been completed, arrange, under direction from the LDCC, for all carcasses, meat, offal and byproducts that are known or suspected to be contaminated to be disposed of by salvage

for human consumption, cremation, burial or rendering. Materials destroyed under this provision may be subject to compensation, so accurate records, certified by either an officer of the state or territory veterinary authority or a person accredited by the state or territory veterinary authority, must be kept of all materials destroyed to support claims for compensation.

- g) Arrange cleaning of the killing floor, all contaminated storage areas and yards as appropriate. This will be followed by planned, detailed disinfection (see the **Decontamination Manual**).
- h) Ensure that any remaining meat, animal products, offal or byproducts stored in the establishment are satisfactorily identified.
- i) Liaise with management and/or the chief engineer and stockyards manager to ensure adequate disposal of all wastewater, after treatment if necessary. All stock must be denied access to such water, and it should not be used for irrigation. Ensure that feed, water and shelter are provided if necessary. Other animals on the premises should be moved away from the boundary.
- j) Use the animal emergency information system (ANEMIS) to facilitate trace-forward of all vehicles, products and people that have left the premises since the affected animal(s) entered the premises.
- k) If possible, call a meeting of plant personnel to explain the ramifications of the disease and the precautions that need to be taken, both in the plant and at home.
- l) Arrange with management for all workers who are likely to have had contact with suspect animals to remain on site until they have been thoroughly decontaminated (ie a shower and a complete change of outer clothing). Arrangements should be made to ensure that these workers have no subsequent contact with susceptible livestock for a period of time appropriate for the disease.
- m) Ask management to provide a full list of livestock (as well as names and addresses of owners and transport) arriving at the works for a period going as far back as the plant normally holds pens of livestock, and to compile a list of all products held in storage, their types and the amount of processing to which they have been subjected.
- n) Do not make comments to the media, except as outlined in Section 4.8.

Senior meat inspector/responsible company employee action list

This action list will need to coordinate with the overall plan, and so should be carried out in consultation with the IPSS. Other managers and supervisors will need to be regularly briefed.

- a) Supervise cleaning of the killing floor, all contaminated storage areas and yards as appropriate. This will be followed by a planned, detailed disinfection under the instructions of the IPSS.
- b) Facilitate identification of any remaining meats, animal products, offals or byproducts stored in the establishment.

Plant manager action list

- a) Stop all movement into, out of and within the works (refer to the quarantine notice).
- b) Discuss arrangements for cremation, burial or treatment by rendering with the chief engineer and IPSS. Ensure that full safety precautions are taken if stock are shot in the yards rather than the knocking box.
- c) Arrange cleaning of the killing floor, all contaminated storage areas, yards and change rooms as appropriate. This will be followed by planned, detailed disinfection under the instructions of the IPSS.
- d) Facilitate trace-forward by the authorities of all vehicles, products and people that have left the premises since the affected animal(s) entered the premises.
- e) Make provisions to provide a full list of stock (as well as names and addresses of owners and transport) arriving at the works, for a period going as far back as the plant normally holds pens of livestock, and for a list to be compiled of all products held in storage, their types and the amount of processing to which they have been subjected.
- f) Make arrangements for all workers who are likely to have had contact with suspect animals to go to the amenities, leave their boots inside the door, shower, put on a complete change of clothing and go to the canteen to await an explanatory meeting.
- g) Organise for all suspect contaminated clothing to be laundered on the premises, or held in secure plastic bags until appropriate cleaning under supervision can be carried out.
- h) Instruct senior staff to supervise the cleaning and disinfection of all equipment identified as potentially contaminated.
- i) If necessary, organise for footbaths containing appropriate disinfectant at the prescribed concentration to be provided at strategic points (particularly exit/entry to stockyards) for use by all staff. Brief section managers to ensure that footbaths are used and replenished regularly.
- j) Place a standstill order on all vehicles on the abattoir grounds that were used in the transport of livestock, carcasses or parts of carcasses. Facilitate thorough cleaning and disinfection of all transport vehicles.
- k) Intensify the rodent and feral animal control program.

4 Resumption of slaughter

After completion of decontamination, consideration may be given to the resumption of slaughtering operations, depending on the site of the establishment and the disease situation in the declared areas. Slaughter may only be recommenced on the direction of the disease control authorities. Stock will be allowed to move only under permit. Depending on the disease and circumstances, stock should be inspected within 24 hours before movement, together with other animals on the property as necessary, to preclude disease. Stock from quarantined

premises could have stricter limitations placed on them, such as details of expected time of arrival and the name of the person to call if the shipment does not arrive by close of business on the scheduled day of arrival.

Decisions will have to be made on all product that is held in storage. These decisions will be made by the disease control authorities, in consultation with the IPSS and the abattoir management, and will depend on the availability of suitable markets. It is essential that the contamination of stored products by infected carcasses, by byproducts or by abattoir staff is prevented.

Modification of existing processing procedures may facilitate the sale of some products (eg extra storage time, specified time of chilling before freezing, heat treatment).

Produce for sale on local markets may only be released at the discretion of the state or territory CVO.

The availability or otherwise of markets for produce held in storage may depend on:

- the success of the abattoir management, the food standards team and the IPSS in preventing the mixing of infected and clean products at all points of processing;
- the accuracy of the records of product origins; and
- the results of trace-back procedures.

5 Procedures for slaughtering establishments and associated enterprises operating in a declared area but not known to be infected

Animals may move to the abattoirs only under permit and direct from properties in the CA certified free from the EAD. Arriving animals must be slaughtered within 24 hours. No susceptible animals should leave the premises. Facilities must be provided by management for the cleaning and disinfection of vehicles delivering animals to the slaughterhouse. Cleaning and disinfection of vehicles must be carried out immediately after unloading.

As far as is practicable, all stock on the premises must be slaughtered before further animals are allowed into the paved holding pens. Paved yards for holding stock awaiting slaughter must be emptied systematically in the same order as they were filled. All such yards should be thoroughly cleaned and disinfected at least once every 24 hours. (Note: This provision may restrict capacity to one day's kill.) Yards, unloading bays, etc, must be hosed down regularly and kept clean at all times.

All other areas that are soiled with animal excreta, flesh or fluid must be cleaned at least daily. In addition, contamination of the environment with those materials must be reduced to an absolute minimum.

The walls and floors of the slaughterhouse must be washed down, cleaned and disinfected every 24 hours, or more often if required.

Slaughtering implements must be thoroughly cleaned and sterilised in boiling water or by another approved means of disinfection, and all other equipment

should be thoroughly cleaned and washed when slaughtering and dressing have been completed for the day.

The walls and floors of hanging rooms, chill rooms, cold stores, boning and offal rooms, and rooms for the storage or processing of edible offals must be cleaned daily. All equipment used in such rooms should be cleaned and sanitised at the end of daily operations.

Inedible offals, unprocessed viscera and refuse should be destroyed by dry rendering, burning or burial on the premises on the day of production. These materials should be stored in leakproof receptacles when on the premises. Every 24 hours, the rooms or bays where the receptacles are kept should be thoroughly cleaned and sanitised.

Hide and skin rooms, or other areas where hides and skins are stored, should be cleaned in a similar manner immediately after the hides and skins have been collected.

All manure should be disposed of under supervision. Abattoir operators should note that no manure, refuse, waste meat trimmings or animal matter of any kind (apart from edible offals, or byproducts intended for human consumption or for processing) may be removed from an abattoir in a declared area without written permission. They may not be moved out of the CA.

All people working in the abattoir must be supplied daily with clean protective clothing and protective headgear. When work ceases for the day, boots and aprons should be disinfected and kept on the premises. Protective clothing should only leave the premises for laundering under appropriate security. Workers must use showers where these are provided.

Only people working in or having bona fide business at the abattoir should be allowed access. Facilities must be provided to allow visitors, particularly stockmen and truck drivers, to disinfect their boots before leaving, and they will be compulsorily required to do so. Truck drivers should remain in the cabs of their vehicles whenever possible and wear protective clothing if outside their trucks. This should be discarded or disinfected before they leave. People must wash their hands with soap and water before leaving the site.

Accurate records must be kept of all animals slaughtered and the movement of product. These will be made available, if required, for tracing purposes.

Appendix 3 Codes of practice

The following codes of practice may be required for reference during an EAD response.

Codes originating from the Subcommittee on Veterinary Public Health (SCVPH)

- *Hygienic Production and Inspection of Meat for Human Consumption*
- *Transportation of Meat for Human Consumption*
- *Smallgoods Factories and Other Meat Manufacturing or Storage Premises*
- *Game Meat for Human Consumption*
- *Hygienic Production of Meat Meal*
- *Construction and Equipment of Abattoirs*
- *Production, Ante-mortem and Post-mortem of Commercially Grown Rabbits*
- *Hygienic Manufacture of Natural Sausage Casings*
- *Product and Inspection of Chilled and Frozen Pet Food.*

Codes originating from the Australian Quarantine and Inspection Service (AQIS)

- *Guidelines for the Welfare of Animals at Abattoirs and Slaughterhouses (Animal Care Statements)*
- *Approval of chemical compounds used at establishments registered to prepare goods prescribed for the purposes of the *Export Control Act 1982**
- *Construction and Equipment Guidelines of Export Meat Establishments*
- *Code of Hygienic Practice for Heat-treated Refrigerated Foods Packaged for Extended Shelf Life*
- *Guidelines for Good Manufacturing Practice in the Smallgoods Industry*

A number of Standing Committee on Agriculture and Resource Management (SCARM) reports and codes also relate to the welfare of animals.

Appendix 4 Rendering of material to inactivate disease agents

Table A4.1 AUSVETPLAN disease-rendering matrix chart

No.	Disease	Disease agent	Disease class ^a
1	African horse sickness	virus	3
2	African swine fever	virus	3
3	Anthrax	spore-forming bacteria	2
4	Aujeszky's disease	virus	3
5	Avian influenza (highly pathogenic)	virus	3
6	Bluetongue	virus	3
7	Bovine brucellosis	bacteria	3
8	Bovine spongiform encephalopathy	prion	1
9	Classical swine fever	virus	3
10	Equine influenza	virus	3
11	Foot-and-mouth disease	virus	3
12	Japanese encephalitis	virus	3
13	Lumpy skin disease	virus	3
14	Newcastle disease	virus	3
15	Peste des petit ruminants	virus	3
16	Porcine reproductive and respiratory syndrome	virus	3
17	Rabies	virus	3
18	Rift Valley fever	virus	3
19	Rinderpest	virus	3
20	Scrapie	prion	1
21	Screw-worm fly	parasite	3
22	Sheep pox and goat pox	virus	3
23	Swine vesicular disease	virus	3
24	Transmissible gastroenteritis	virus	3
25	Vesicular exanthema	virus	3
26	Vesicular stomatitis	virus	3

^a Class 1 includes prions (disease agent of transmissible spongiform encephalopathies); Class 2 includes spore-forming bacteria; Class 3 includes vegetative bacteria and viruses.

Table A4.2 Descriptions of types of rendering required for different classes of disease

Rendering system	Rendering parameters	Target disease class ^a
A. Batch dry (EU autoclave system)	Standard EU program for mammalian material [133°C for 20 minutes at a pressure of 3 bar (absolute)]; particle size not greater than 50 mm.	1, 2 and 3
B. Continuous or batch dry	Typical dry-rendering program with minimum retention time 45 minutes in continuous cooker and minimum retention time 90 minutes in batch cooker and end point temperature >135°C.	2 and 3

C. Continuous wet (indirect steam drier)	Typical continuous wet-rendering program, including drying for a period of 120 minutes at a product temperature of not less than 110°C.	2 and 3
D. Continuous wet (direct fired)	Standard continuous wet-rendering program, including a direct-fired drying stage where the combustion chamber temperature is not less than 640°C and the particle size is less than 30 × 20 × 10 mm and input meal temperature >50°C.	2 and 3

EU = European Union

a Class 1 includes prions (disease agent of TSE); Class 2 includes spore-forming bacteria; Class 3 includes vegetative bacteria and viruses.

Action for the correct rendering of material is as follows:

1. Consult Table A4.1 to identify the disease class (classes 1–3, with 1 being the most resistant to thermal processing). Consult Table A4.2 to identify the appropriate rendering system and the rendering parameters sufficient to inactivate the disease agent.
2. For those disease agents that pose a risk through physical contamination, erect temporary physical barriers at the primary separation point to isolate raw material (carcasses, parts, waste), including all machinery for comminuting, storing and conveying the material to the primary separation point. The purpose of the barriers is to prevent the spread of infection by aerosols, splash or physical contact from the area used before heat treatment to the area used after treatment, where recontamination of the processed meal could occur. The barriers are most easily constructed of pine timber framing covered by heavy-duty polythene sheeting (obtained from builders' hardware stores in rolls up to 50 m × 4 m × 200 µm). The barriers can be incinerated as part of the decontamination procedure after processing is completed.
3. The movement of personnel, portable equipment and tools out of the raw material area into any area where heat-treated product is to be further processed or stored must be prohibited, unless a decontamination process appropriate to the disease is first carried out. This may include showering and a complete change of clothing for personnel. Different coloured clothing should be used to identify people working in the clean and dirty areas. The danger of contamination of products other than those that have been rendered must also be evaluated, and appropriate measures taken to prevent this.
4. Set up a procedure to record all meatmeal and tallow production to ensure that only product that has been sampled and proven free from the disease organism is moved from storage.
5. Verify that all items of plant work to the standards set for the disease agent, and then begin processing.
6. Verify that the required time and temperature parameters are being achieved. If the rendering plant is fitted with automatic systems for chart or computer recording of temperature against time, this will be adequate. If not, it will be necessary to record manually all relevant details of loading and cooking, pressing and drying. Use this system to ensure that meatmeal samples taken from storage can be correlated with the time and temperature information relating to their production.

7. Sample processed product at selected time intervals, identify the samples, and hold them for analysis. The size of sample will depend on the amount required to detect an infective dose of the particular disease agent. The SDCHQ may consult the Australian Animal Health Laboratory for guidance. The frequency of sampling is a matter of judgment. Because all material produced since the previous negative sample must be deemed to be positive, the longer the sampling interval, the greater the potential requirement for reprocessing.
8. Maintain a storage plan identifying production between samples with the sample taken at the end of the sampling interval.
9. Set up a register of dispatch of material that records all pertinent details, including date, destination, production batch, receiver, vehicle, driver and any other information that would facilitate recall or quarantining of the product.
10. On completion of processing of all suspect or diseased material, carry out decontamination, by an appropriate method, of the raw material collection area. This will require dismantling of enclosed machinery so that raw material that has accumulated in inaccessible spaces can be cleaned out before decontamination.

Appendix 5 Examples of trace-back systems

Recording of stock movements in Queensland

- Cattle
 - National Livestock Identification System (NLIS)
 - tagging with registered tail or ear tags
 - brands
 - national vendor declarations
 - waybills and permits
- Sheep – national vendor declaration and waybills
- Pigs – tattoo assigned to owner
- Goats – feral and domestic are treated as for sheep
- Horses – waybill required if travelling to slaughter
- Game carcasses
- All species – certificate of health for interstate introductions.

Recording of stock movements in South Australia

- Agents' invoices
- Cattle
 - NLIS
 - national vendor declarations
- Pigs – tattooed
- Horses – paperwork marked with collection point, but not necessarily property of origin
- Sheep – those with footrot documented for direct slaughter.

After receipt at meatworks

The meat processing establishment will need to put in place a system of identification that includes a receipt docket and the allocated pen numbers. The receipt docket should contain essential information, such as:

- date
- received from (owner and address)
- time loaded
- delivered by (truck driver and company)
- registration number of vehicle and trailer
- species of stock
- class of stock (sex, age)

- numbers of stock
- identification (tail tags, brands, tattoos, ear marks).

A receival docket should be completed for each lot delivered to the establishment. When accurately completed, it should provide concise and rapid trace-back information in the event of an EAD being found at a meatworks, or for trace-forward purposes.

Permits, waybills, kill sheets and other relevant documents should be used to produce a list of all stock movements to meatworks, with the following information:

- properties
- saleyards
- agents
- trucking companies
- trucks (registration numbers)
- trailers (registration numbers)
- train movements
- stock railway wagons identification.

Glossary

Agricultural authorities	The state or territory department of agriculture or primary industry responsible for disease control.
Animal byproducts	Products of animal origin that are not for consumption but are destined for industrial use (eg hides and skins, fur, wool, hair, feathers, hooves, bones, fertiliser). <i>See also</i> Co-product
Animal Health Committee	A committee comprising the CVOs of Australia and New Zealand, Australian state and territory CVOs, Animal Health Australia, and a CSIRO representative. The committee provides advice to PIMC on animal health matters, focusing on technical issues and regulatory policy (formerly called the Veterinary Committee). <i>See also</i> Primary Industries Ministerial Council (PIMC)
Animal products	Meat, meat products and other products of animal origin (eg eggs, milk) for human consumption or for use in animal feedstuff.
Area technical manager	Technical officer-in-charge of the Australian Quarantine Inspection Services in a particular area.
Australian Chief Veterinary Officer	The nominated senior veterinarian in the Australian Government Department of Agriculture, Fisheries and Forestry who manages international animal health commitments and the Australian Government's response to an animal disease outbreak. <i>See also</i> Chief veterinary officer
AUSVETPLAN	<i>Australian Veterinary Emergency Plan.</i> A series of technical response plans that describe the proposed Australian approach to an emergency animal disease incident. The documents provide guidance based on sound analysis, linking policy, strategies, implementation, coordination and emergency-management plans.
Chief veterinary officer (CVO)	The senior veterinarian of the animal health authority in each jurisdiction (national, state or territory) who has responsibility for animal disease control in that jurisdiction. <i>See also</i> Australian Chief Veterinary Officer
Compensation	The sum of money paid by government to an owner for stock that are destroyed and property that is compulsorily destroyed because of an emergency animal disease. <i>See also</i> Cost-sharing arrangements, Emergency Animal Disease Response Agreement

Consultative Committee on Emergency Animal Diseases (CCEAD)	A committee of state and territory CVOs, representatives of CSIRO Livestock Industries and the relevant industries, and chaired by the Australian CVO. CCEAD convenes and consults when there is an animal disease emergency due to the introduction of an emergency animal disease of livestock, or other serious epizootic of Australian origin.
Control area	A declared area in which the conditions applying are of lesser intensity than those in a restricted area (the limits of a control area and the conditions applying to it can be varied during an outbreak according to need).
Co-product	The inedible material, other than effluent, produced at the establishment. <i>See</i> Animal byproducts
Cost-sharing arrangements	Arrangements agreed between governments (national and states/territories) and livestock industries for sharing the costs of emergency animal disease responses. <i>See also</i> Compensation, Emergency Animal Disease Response Agreement
Dangerous contact animal	A susceptible animal that has been designated as being exposed to other infected animals or potentially infectious products following tracing and epidemiological investigation.
Dangerous contact premises	Premises that contain dangerous contact animals or other serious contacts.
Declared area	A defined tract of land that is subjected to disease control restrictions under emergency animal disease legislation. Types of declared areas include <i>restricted area, control area, infected premises, dangerous contact premises and suspect premises</i> .
Decontamination	Includes all stages of cleaning and disinfection.
Depopulation	The removal of a host population from a particular area to control or prevent the spread of disease.
Destroy (animals)	To slaughter animals humanely.
Discharges	Intentional or unintentional emissions of gas, liquid or solid matter from a premises other than products or byproducts.
Disease agent	A general term for a transmissible organism or other factor that causes an infectious disease.
Disease Watch Hotline	24-hour freecall service for reporting suspected incidences of exotic diseases – 1800 675 888

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

Incubation period	The period that elapses between the introduction of the pathogen into the animal and the first clinical signs of the disease.
Index case	The first or original case of the disease to be diagnosed in a disease outbreak on the index property.
Index property	The property on which the first or original case (index case) in a disease outbreak is found to have occurred.
Infected premises	A defined area (which may be all or part of a property) in which an emergency disease exists, is believed to exist, or in which the infective agent of that emergency disease exists or is believed to exist. An infected premises is subject to quarantine served by notice and to eradication or control procedures.
Investigation phase	<i>See</i> Stages of activation and deactivation
Job card	A written list of tasks to be carried out by an individual <i>or group</i> as part of an emergency response.
Lairage area	A lairage area is one that holds animals that are being slaughtered that day.
LDCC controller	The veterinary officer nominated by the CVO to manage the local disease control centre.
Local disease control centre (LDCC)	An emergency operations centre responsible for the command and control of field operations in a defined area.
Monitoring	Routine collection of data for assessing the health status of a population. <i>See also</i> Surveillance
Movement control	Restrictions placed on the movement of animals, people and other things to prevent the spread of disease.
Myiasis	Parasitism of animal tissues by the larvae of flies.
National management group (NMG)	A group established to direct and coordinate an animal disease emergency. NMGs may include the chief executive officers of the Australian Government and state or territory governments where the emergency occurs, industry representatives, the Australian CVO (and chief medical officer, if applicable) and the chairman of Animal Health Australia.
Native wildlife	<i>See</i> Wild animals
Officer in charge	A person charged with the management of a defined operation.

OIE Terrestrial Code	<i>OIE Terrestrial Animal Health Code</i> . Reviewed annually at the OIE meeting in May and published on the internet at: http://www.oie.int/eng/normes/mcode/a_summry.htm
OIE Terrestrial Manual	<i>OIE Manual of Standards for Diagnostic Tests and Vaccines for Terrestrial Animals</i> . Describes standards for laboratory diagnostic tests and the production and control of biological products (principally vaccines). The current edition is published on the internet at: http://www.oie.int/eng/normes/mmanual/a_summry.htm
Operational phase	<i>See</i> Stages of activation and deactivation
Operational procedures	Detailed instructions for carrying out specific disease control activities, such as disposal, destruction, decontamination and valuation.
Operations	The activities necessary to give effect to a disease control strategy.
Owner	Person responsible for a premises (includes an agent of the owner, such as a manager or other controlling officer).
Plan	An agreed course of action; applied only to AUSVETPLAN or the plans of support agencies.
Premises	A tract of land including its buildings, or a separate farm or facility that is maintained by a single set of services and personnel.
Prevalence	The proportion (or percentage) of animals in a particular population affected by a particular disease (or infection or positive antibody titre) at a given point in time.
Primary Industries Ministerial Council (PIMC)	The council of Australian national, state and territory and New Zealand ministers of agriculture that sets Australian and New Zealand agricultural policy (formerly the Agriculture and Resource Management Council of Australia and New Zealand). <i>See also</i> Animal Health Committee
Product	The edible material produced at the establishment. <i>See</i> Animal products
Quarantine	Legal restrictions imposed on a place or a tract of land by the serving of a notice limiting access or egress of specified animals, persons or things.
Rendering	Processing by heat to inactivate infective agents. Rendered material may be used in various products according to particular disease circumstances.
Restricted area	A relatively small declared area (compared with a control area) around an infected premises that is subject to intense surveillance and movement controls.

Risk enterprise	A defined livestock or related enterprise, which is potentially a major source of infection for many other premises. Includes intensive piggeries, feedlots, abattoirs, knackeries, saleyards, calf scales, milk factories, tanneries, skin sheds, game meat establishments, cold stores, artificial insemination centres, veterinary laboratories and hospitals, road and rail freight depots, showgrounds, field days, weighbridges, garbage depots.
Sensitivity	The proportion of affected individuals in the tested population that are correctly identified as positive by a diagnostic test (true positive rate). <i>See also</i> Specificity
Sentinel animal	Animal of known health status that is monitored to detect the presence of a specific disease agent.
Serotype	A subgroup of microorganisms identified by the antigens carried (as determined by a serology test).
Specificity	The proportion of nonaffected individuals in the tested population that are correctly identified as negative by a diagnostic test (true negative rate). <i>See also</i> Sensitivity
Stages of activation:	Investigation, alert, operational, stand-down.
- investigation phase	Exists when key members of the Animal Health Authority are notified that an animal disease emergency may be imminent, or exists in another state or territory.
- alert phase	Exists when the CVO notifies the coordinator of the state emergency services that an animal disease emergency may be imminent, or exists in another state.
- operational phase	Exists when the CVO notifies the coordinator of the state emergency services that an animal disease emergency exists in the state.
- stand-down phase	Exists when the CVO notifies the coordinator of the state emergency services that an animal disease emergency no longer exists.
Stamping out	Disease eradication strategy based on the quarantine and slaughter of all susceptible animals that are infected or exposed to the disease.
State or territory disease control headquarters	The emergency operations centre that directs the disease control operations to be undertaken in that state or territory.
Strategy	The principles on which control of a disease is based.

Surveillance	A systematic program of investigation designed to establish the presence, extent of, or absence of a disease, or of infection or contamination with the causative organism. It includes the examination of animals for clinical signs, antibodies or the causative organism.
Susceptible animals	Animals that can be infected with a particular disease.
Suspect animal	An animal that may have been exposed to an emergency disease such that its quarantine and intensive surveillance, but not pre-emptive slaughter, is warranted. <i>or</i> An animal not known to have been exposed to a disease agent but showing clinical signs requiring differential diagnosis.
Suspect premises	Temporary classification of premises containing suspect animals. After rapid resolution of the status of the suspect animal(s) contained on it, a suspect premises is reclassified either as an infected premises (and appropriate disease-control measures taken) or as free from disease.
Tracing	The process of locating animals, persons or other items that may be implicated in the spread of disease, so that appropriate action can be taken.
Vaccine:	Modified strains of disease-causing agents that, when inoculated, stimulate an immune response and provide protection from disease.
- 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.
Vaccination	Inoculation of healthy individuals with weakened or attenuated strains of disease-causing agents to provide protection from disease.
- swamp vaccination	Widespread vaccination of a large proportion of susceptible animals.
- ring vaccination	Vaccination of susceptible animals around a focus of infection to provide a buffer against the spread of disease.

Vector	A living organism (frequently an arthropod) that transmits an infectious agent from one host to another. A <i>biological</i> vector is one in which the infectious agent must develop or multiply before becoming infective to a recipient host. A <i>mechanical</i> vector is one that transmits an infectious agent from one host to another but is not essential to the life cycle of the agent.
Veterinary investigation	An investigation of the diagnosis, pathology and epidemiology of the disease. <i>See also</i> Epidemiological investigation
Wild animals:	
- native wildlife	Animals that are indigenous to Australia and may be susceptible to emergency animal diseases (eg bats, dingoes, marsupials).
- feral animals	Domestic animals that have become wild (eg cats, horses, pigs).
- exotic fauna	Nondomestic animal species that are not indigenous to Australia (eg foxes).
Zoning	The process of defining disease-free and infected areas in accord with OIE guidelines, based on geopolitical boundaries and surveillance, in order to facilitate trade.
Zoonosis	A disease of animals that can be transmitted to humans.

Abbreviations

ANEMIS	Animal Health Emergency Information System
AQIS	Australian Quarantine and Inspection Service
ATM	area technical manager
AUSVETPLAN	Australian Veterinary Emergency Plan
BSE	bovine spongiform encephalopathy
CA	control area
CCEAD	Consultative Committee on Emergency Animal Diseases
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CVO	chief veterinary officer
DAFF	Department of Agriculture, Fisheries and Forestry (Australian Government)
DCP	dangerous contact premises
EAD	emergency animal disease
EU	European Union
FMD	foot-and-mouth disease
IP	infected premises
IPSS	infected premises site supervisor
LDCC	local disease control centre
NLIS	National Livestock Identification Scheme
NMG	national management group
OIE	World Organisation for Animal Health (formerly the Office International des Epizooties)
RA	restricted area
SDCHQ	state or territory disease control headquarters
SP	suspect premises
TGE	transmissible gastroenteritis

VS vesicular stomatitis

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Savi P et al (1962). Presence et persistence du virus aphteux dans les viandes de porcins et de bovins et dans leurs produits derives. *Bull Off Inter Epiz* 57:853–890.

Further reading

Individual AUSVETPLAN **Disease Strategies**

Geering WA, Forman AJ and Nunn MJ (1995). *Exotic Diseases of Animals: A Field Guide for Australian Veterinarians*, Australian Government Publishing Service, Canberra, 1995.

Scott Williams Consulting Pty Ltd (2003). *Persistence of Disease Agents in Carcasses and Animal Products*. Report for Animal Health Australia
<http://www.animalhealthaustralia.com.au>

Video/training resources

Animal Health Australia multimedia material on exotic animal diseases. This is currently being developed from a revision of the EXANDIS video collection, which was produced in the 1990s.

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