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

National Biosecurity Committee
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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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 poultry production constitutes part of the Australian Veterinary Emergency Plan or AUSVETPLAN (Edition 3). AUSVETPLAN is a coordinated national response plan for the management and, wherever possible, eradication of exotic disease incursions and outbreaks of certain emerging or endemic animal diseases. The term emergency animal disease (EAD) is used to collectively describe these disease categories.

Enterprise manuals, a component of AUSVETPLAN, are prepared for animal industries in which the risk of harm from an EAD is expected to be higher than normal. For example, the way in which stock are managed may result in a higher likelihood of rapid spread of a disease agent, and thus impact on the response to an outbreak (known as an EAD response) and its associated costs.

Enterprise manuals address the risks associated with so-called risk enterprises. These are defined as livestock or related enterprises that are a potential source of major infection for many other premises, and can thus increase the potential size of an outbreak and affect its nature.

For the purposes of this manual, ‘poultry’ means chickens, ducks and turkeys, reared or kept in captivity.

This enterprise manual covers the main types of enterprises found in the poultry industry; ownership of a number of the enterprises is commonly held by a single integrated company in this industry. The main enterprise types are:

- post-entry quarantine facility — hatchery and farm
- primary breeding farm
- breeder farm — the output of a breeder farm is fertile eggs
- hatchery
- meat bird farm
- poultry meat processing plant
- pullet and layer (table egg) farm
- egg product processing plant
- stockfeed mill
- diagnostic laboratory
- free-range egg and chicken meat farm.

This manual is aimed at both government officers and poultry industry personnel who may be involved in EAD preparedness and responses. For government personnel, including those not familiar with the industry, the manual brings together, from many sources, operational guidelines, plans of action and other resources for dealing with EADs. For owners or managers, the manual provides guidelines on their responsibilities during an EAD outbreak, as required by the relevant government authorities, and the strategies that may be adopted to improve preparedness for, or to handle, a suspected EAD. Managers should include elements of this manual in the operational manuals of their enterprises.
The manual refers to the control of avian influenza, Newcastle disease, and very virulent or exotic antigenic variant forms of infectious bursal disease (IBD), which are all controlled in a similar manner. Where differences in control procedures exist, they are mentioned. The manual should be read in association with other AUSVETPLAN documents, especially the Disease Strategies for avian influenza, Newcastle disease and IBD caused by very virulent IBD virus or exotic antigenic variant strains of IBD virus.

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.

**AUSVETPLAN manuals**

**Disease strategies**
- Individual strategies for each of 35 diseases
- Bee diseases and pests
- Response policy briefs (for diseases not covered by individual manuals)

**Operational procedures manuals**
- Decontamination
- Destruction of animals
- Disposal
- Livestock welfare and management
- Public relations
- Valuation and compensation

**Enterprise manuals**
- Artificial breeding centres
- Feedlots
- Meat processing
- Saleyards and transport
- Pig industry
- Poultry industry (chickens, ducks and turkeys)
- Zoos

**Management manuals**
- Control centres management (Parts 1 and 2)
- Laboratory preparedness
- Wild animal response strategy
- Summary document

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1 Disease management and emergency animal disease preparedness

1.1 Australia’s animal health services

In Australia, each state and territory has operational responsibility for the control and eradication of animal diseases within its borders. Animal health authorities located within the relevant department of primary industries administer legislation relating to responses to emergency animal diseases (EADs), including movement controls, treatment, vaccination, slaughter, disposal, decontamination and compensation. Inspectors have wide powers, including the ability to enter premises, examine records, order livestock musters, control livestock movements, request that animals or products be submitted for testing, and isolate and destroy diseased or suspected diseased livestock. The Australian Government advises on and coordinates national animal health policy, and is responsible for quarantine and international animal health matters, including export certification and trade negotiation, and disease reporting to the World Organisation for Animal Health.

1.2 The risk of an emergency animal disease entering Australia

Importation of live poultry and table eggs is prohibited under import protocols; therefore, these sources are unlikely to be implicated in an EAD outbreak. Fertile eggs are allowed to be imported under strict import protocols that include pre-arrival testing of the donor flock(s) for exotic diseases, and hatching and disease testing of the offspring in post-entry animal quarantine. Importation of poultry meat is allowed in Australia, but is subject to risk management measures such as cooking, freezing, curing, canning, and removal of certain tissues or parts of the carcase. These measures ensure a level of protection for the poultry industry. However, illegal importation of live birds, eggs and other poultry products may pose a risk of an EAD entering Australia.

People returning from overseas who have had contact with poultry could transfer a disease agent to Australian poultry flocks via their footwear or clothing.

In addition, migratory birds (predominantly shorebirds and waders from nearby countries in Southeast Asia) can pose a risk if they harbour EADs and then mingle with, and transmit infection to, waterfowl that are nomadic within Australia. These nomadic birds can then mingle with, and spread the infection to, domestic birds such as poultry.

The consequences of an EAD outbreak to the Australian poultry industry are potentially high. Therefore, the maintenance of strict biosecurity is a pre-eminent concern for all poultry enterprises.

1.3 Principles of emergency animal disease management

In Australia, the traditional role of governments (Australian, and states and territories) in managing animal health is complemented by a close association between government and the livestock industries. National animal health priorities are determined in consultation
with the livestock industries, which participate in policy development, support targeted activities and contribute to emergency responses.

As part of their preparedness arrangements, state and territory animal health authorities develop operational plans for managing EADs that are consistent with AUSVETPLAN and their own legislative framework. These plans are made in conjunction with the state or territory emergency management organisations and support agencies, and contain considerable detail on the various procedures described in this manual.

EAD responses are planned and implemented at three levels — national, state or territory, and local. In the event of an EAD outbreak, relevant state or territory animal health officials manage all aspects of its control and eradication according to a nationally agreed plan. They work with livestock industry liaison officers (ILOs), and the owners and managers of premises within declared areas to resolve the outbreak and return enterprises to normal operations.

The chief veterinary officer (CVO) of the state or territory in which an EAD outbreak occurs is responsible for implementing the disease control measures. The CVO works with the Consultative Committee on Emergency Animal Diseases (CCEAD), which provides the link between the Australian Government, the state and territory governments, and the relevant livestock industry(ies) for technical and veterinary decision making during EAD responses.

The CCEAD advises a high-level national management group (NMG) on response policy. The NMG determines whether an agreement to share the costs of a response between Australia’s governments and the relevant livestock industry(ies) should be invoked. The NMG manages national policy and resourcing of the response. Both the CCEAD and the NMG base their decisions on current information provided by the affected state or territory, and on guidance provided in AUSVETPLAN.

1.4 Emergency Animal Disease Response Agreement

The EAD Response Agreement (EADRA) provides a framework for the Australian Government, the state and territory governments, and the major livestock industries to manage EAD outbreaks cooperatively. It describes the funding of EAD responses, and the sharing of the costs between government and the affected livestock industries.

Four categories of diseases are used to determine the liability for costs. These categories have been developed according to the benefits of controlling the disease, as assessed by the likely impact of the specific EAD on human health, socioeconomics, the environment and livestock production. An EAD response is initially funded by the affected state or territory, with refunds made by the Australian Government on behalf of all funding parties according to an agreed formula for the particular disease, as described in the EADRA. The NMG makes decisions about activation and use of cost-sharing arrangements during an EAD response.

The EADRA also contains many other important instructions that provide the basis for a coordinated national EAD response. In particular, it refers to using existing plans, such as

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2 The full title of the agreement is the Government and Livestock Industry Cost Sharing Deed in Respect of Emergency Animal Disease Responses. For more information, see www.animalhealthaustralia.com.au/programs/emergency-animal-disease-preparedness/ead-response-agreement
AUSVETPLAN; sets standards for accounting, auditing and training personnel; and provides the incentive for developing and maintaining government and industry biosecurity measures. The EADRA specifies that the lead agency in the state where the EAD outbreak occurs must develop an EAD Response Plan. The plan must be consistent with the relevant Disease Strategy, endorsed by the CCEAD and approved by the NMG.

The EADRA includes a firm commitment by the parties to implement biosecurity plans. Animal Health Australia manages these plans as part of its National Disease Mitigation Program.

Table 1.1 describes the four disease categories and their respective shared-cost arrangement.

<table>
<thead>
<tr>
<th>Category</th>
<th>Shared-cost arrangement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100% government</td>
</tr>
<tr>
<td>2</td>
<td>80% government, 20% industry</td>
</tr>
<tr>
<td>3</td>
<td>50% government, 50% industry</td>
</tr>
<tr>
<td>4</td>
<td>20% government, 80% industry</td>
</tr>
</tbody>
</table>

For the EADs that might affect poultry, the EADRA covers:
- highly pathogenic avian influenza, subtypes H5 and H7 (Category 2)
- low pathogenicity avian influenza, subtypes H5 and H7; and highly pathogenic avian influenza, subtypes other than H5 and H7 (Category 3)
- Newcastle disease in its classical virulent form (Category 3)
- infectious bursal disease (IBD) caused by very virulent IBD virus (Category 4).

1.5 **AUSVETPLAN**

AUSVETPLAN is the national contingency planning framework for the management of EAD incidents in Australia. The plan ensures coherent operations and procedures in the management of an EAD incident among national, state and territory animal health authorities, and emergency management organisations.

Animal Health Australia, the custodian of AUSVETPLAN, works closely with Australian, state and territory governments, and livestock industries to determine priorities and regularly review AUSVETPLAN to ensure that it is current and appropriate. Government endorses finalised manuals that deal with response policy.

Everyone involved in the EAD preparedness of poultry enterprises should understand the nature and structure of AUSVETPLAN. **Enterprise manuals** do not stand alone and must be read in association with other AUSVETPLAN documents.³

Readers should also be aware of:

- the standard operating procedures that are prepared by the appropriate jurisdiction and support AUSVETPLAN
- plans involving other areas of state and territory emergency management arrangements (e.g., police, local government)
- diagnostic resources
- training materials.

A series of individual AUSVETPLAN manuals cover all the elements of EAD preparedness and management:

- **Summary Document.** This describes the components of AUSVETPLAN and outlines their functional relationships.

  - **Disease strategies.** These are authoritative references to the Australian control and eradication policies for 35 significant diseases. They provide information about the nature of the disease; the principles of its control and eradication; and control policies, strategies and recommendations. Sufficient information is included to allow authorities to make informed decisions about controlling an EAD outbreak. The available poultry-related disease strategies are:

    - avian influenza
    - IBD caused by very virulent IBD virus or exotic antigenic variant strains of IBD virus
    - Newcastle disease.

- **Response policy briefs.** These provide brief information on a further 27 EADs that are subject to cost sharing, but are not covered by full disease strategies as they have a low likelihood of entry to Australia, and any consequences are likely to be less severe.

- **Operational procedures manuals.** These describe, in detail, the recommended procedures for different aspects of an EAD response, such as animal destruction and disposal, decontamination of infected sites, and communication management.

- **Management manuals.** These provide detailed information on specific components of a response. For example, the **Control Centres Management Manual (Parts 1 and 2)** provides details of the management structure, and roles and responsibilities at the national, state or territory, and local levels. The other management manual is the manual for **Laboratory Preparedness.**

- **Enterprise manuals.** These cover specific risk enterprises — such as abattoirs, artificial-breeding centres, beef-cattle feedlots, piggeries and poultry enterprises — that pose special economic or disease eradication problems, or are important in the epidemiology or impact of the disease. They provide information and guidance to two target groups:

    - government personnel involved in EAD preparedness who may be unfamiliar with the operations of the industry of which the enterprise is part
    - industry personnel and veterinarians who need information on strategies that may be adopted to improve preparedness, and guidance on the operational procedures that may be applied to exclude, contain or eradicate an EAD.

- **Wild Animal Response Strategy.** This sets out the management strategies and overall control procedures for wild animals for use in an animal health emergency.

This complex web of plans is illustrated in Figure 1.1.
1.6 Legislation

Legislation to control EADs has been enacted at both the national and state/territory levels. The national legislation is primarily concerned with preventing the introduction and establishment of disease, or the introduction of things that may carry disease. Statutory provisions in all states and territories aim to control and eradicate specified diseases in animals, and establish controls over animal movement, treatment, decontamination, slaughter and compensation. Wide powers are conferred on government inspectors, including the power to enter premises, order stock musters, test animals, and order the destruction of animals and products that are suspected of being infected or contaminated.

1.7 Controlling a major disease outbreak

Control of an EAD outbreak is a complex operation, requiring rapid mobilisation of resources and coordination of a diverse team of people. An EAD response may require input from all tiers of government and from a range of portfolios, as it may need to address not only animal health issues, but also financial, social, economic, human, trade and recovery issues.

The fundamental aim of national EAD control policy is to eradicate an EAD if this is reasonably feasible. Key factors taken into account are those related to the disease and affected population. For example, the principal option used for many EADs is eradication by stamping out where this is applicable to the EAD in question and is considered to be cost-effective. This may involve:

- quarantine of premises and/or movement controls
- valuation and compensation
- destruction and disposal of infected and exposed susceptible animals

Figure 1.1 Available AUSVETPLAN manuals that cover all aspects of emergency animal diseases
• decontamination of infected premises
• surveillance of susceptible animals
• restriction of the activities of certain enterprises
• an industry and public awareness program.

Other measures that may be used where necessary include:
• vaccination
• vector or wild animal control
• treatment of affected animals
• use of sentinel animals.

In some circumstances, a modified stamping-out approach may be used if it is possible to slaughter animals safely at an accredited abattoir to produce a marketable product.

Sometimes, eradication is not considered feasible because the incursion is already widespread when diagnosed or is considered likely to spread further despite the application of stamping out. In these cases, other control measures may be decided upon, such as vaccination (with a view to possible containment and eventual eradication), or a state or territory and/or industry-based control program to manage a disease that is likely to become endemic in the population. Where the NMG has reason to believe that eradication is not possible and the disease can only be contained, or in any situation where the cost of an EAD response plan will exceed an agreed limit on funding, the NMG may decide to stop cost sharing.

All disease control field activities have significant implications for livestock producers. Factors that need to be taken into account in developing an appropriate response include the protection of valuable breeding stock and business continuity. Disease control activities are managed from a local control centre (LCC), usually established in the vicinity of the outbreak. The LCC is responsible for all activities within the restricted area, including investigations of reports of disease outbreaks, consultation with livestock producers, specimen collection, property quarantine, valuation of livestock and property, livestock slaughter and disposal, and property decontamination.

Information on the structure, roles and responsibilities of the state or territory control centres (SCCs) and LCCs is contained in the Control Centres Management Manual, Part 1.

ILOs in the poultry industry are trained and accredited to undertake prescribed AUSVETPLAN roles in both SCCs and LCCs. They are a point of contact for local producers and a source of advice to the LCC managers.

The response to an incursion of an exotic poultry disease will be determined by the epidemiology of the incursion, including:
• how early the incursion is detected
• the extent of the incursion
• the location of affected premises
• whether other species of birds are affected
• characteristics of the agent involved.
1.7.1 Livestock movement restrictions

Controlling the movement of livestock that are susceptible to a disease is an essential component of livestock disease control. However, such regulatory controls have significant potential to adversely affect the operations of poultry enterprises, especially when they are maintained for an extended period.

1.7.2 National livestock standstill

For some EADs, a national standstill on the movement of all susceptible species may be declared by the state and territory authorities, with immediate effect from the time of strong suspicion or diagnosis. The standstill will apply for at least 3 days and possibly up to 7 days. This means that no susceptible stock may be moved from their current location, and those undergoing transport at the time of declaration are required to stop moving as soon as practicable. Movements may be allowed under permit, however; in this context, consideration will be given to the welfare of meat bird flocks that are scheduled for pick-up during the standstill period. Guidelines for managing animals that are in transit at the time of the declaration will be provided by the disease response authorities. A national standstill on livestock movement potentially reduces the spread of a disease and provides time for the EAD response to trace animals, carry out surveillance to determine the outbreak size and develop a management plan.

1.7.3 Declared areas

For some EADs, a national standstill may be followed by the declaration of control areas (CAs) and restricted areas (RAs). These declared areas are geographic areas of land where the movement of livestock (and other materials) may be restricted for extended periods.

An RA is a relatively small epidemiologically developed area around infected premises (IPs) and dangerous contact premises (DCPs) that is subject to the most intense surveillance and movement controls.

The initial RA is generally based on a minimum 3-km radius around an IP, and is ‘drawn’ so it contains all known IPs and DCPs, and as many as practicable trace premises and suspect premises. Movement of live animals out of the RA is usually prohibited, while movement within and into it would only occur following the issue of an official permit by a stock inspector. Guidelines for establishing an RA are provided in the relevant Disease Strategy for the EAD. Multiple RAs may exist within one CA.

A CA forms a buffer between an RA and areas considered to be free from disease. Initially, a CA may be declared over the whole state or territory, but will usually be reduced in size as authorities learn more about the extent of the outbreak. A CA will generally maintain a minimum radius of 10 km from the IPs, and include the RA. Live susceptible animals and their products will be subject to movement controls.

As for RAs, animal movements out of a CA will usually be prohibited. Vehicles and specified products will only be allowed out of a CA into the free area by official permit. The actual movement conditions will depend on the disease and will be determined by the lead agency. Information on movement conditions will be available through official channels, such as government authority websites, as well as media outlets. Usually, permits will be issued for specific movements to continue where the risk is low.
Once the nature and distribution of a disease are understood, infected and disease-free zones may be established for longer term control of the disease agent and to assist in protecting Australia’s export trade. These will generally be based on the RAs and CAs.

Figure 1.2 illustrates how controls over the movement of poultry may affect access to declared areas; similar principles may apply to people and equipment.

![Schematic illustration of standard movement controls during an emergency animal disease outbreak](image)

It is important to recognise that the designation of declared areas can change during an EAD response as authorities learn more about the nature and distribution of the disease. These changes create uncertainties that make forward planning for the resumption of livestock movements difficult.

Premises classifications in an EAD response are as follows:

- **Infected premises (IP):** A defined area (which may be all or part of a property) in which an EAD exists or is believed to exist, or in which the infective agent of that EAD exists or is believed to exist.

- **Dangerous contact premises (DCP):** A premises that contains a susceptible animal(s) not showing clinical signs, but, following a risk assessment, is considered highly likely
to contain an infected animal(s) and presents an unacceptable risk to the response if not addressed.

- **Suspect premises (SP):** A temporary classification of a premises that contains a susceptible animal(s) not known to have been exposed to an infected animal, but showing clinical signs that require an investigation(s).

- **Trace premises (TP):** A temporary classification of a premises that contains a susceptible animal(s) that tracing indicates may have been exposed to an infected animal(s) and requires an investigation(s).

- **At-risk premises (ARP):** Premises in an RA that contain a susceptible animal(s), but are not considered at the time of designation to be an SP, DCP, IP or TP.

- **Premises of relevance (POR):** A premises in a CA that contains a susceptible animal(s), but is considered at the time of designation not to be an IP, DCP, SP or TP. Animals in a POR are subject to procedures applicable in the CA, such as heightened surveillance and movement restrictions.

- **Resolved premises (RP):** An IP that has completed the required control measures, and is subject to the procedures and restrictions appropriate to the area in which it is located.

- **Unknown status premises (UP):** A premises that has been identified as having an unknown animal status.

- **Zero susceptible stock premises (ZP):** A premises that contains no susceptible animals.

- **Assessed negative (AN):** A qualifier applied to a premises previously defined as a DCP, SP, TP or ARP that has been cleared of suspicion at the time of designation, and is subject to the procedures and restrictions appropriate to the area in which it is located. (Note: AN is a qualifier to document progress in the response and in the proof-of-freedom phase. It is not to be used at the same level as the other premises classifications.)

Although these designations seem complex, it is important to understand that a property may fit into only one classification at any given time. In addition, not all of these classifications may be needed in a particular EAD response. Based on the disease risk, the highest priorities for investigation by the disease control authority are IPs, DCPs, SPs and TPs.

On an IP, SP, DCP or TP, quarantine and movement controls will apply. On an SP, DCP or TP, other disease control actions will follow only if the premises is reclassified as an IP. On an IP, live poultry may be destroyed as part of a stamping-out strategy, or authorities may introduce other compulsory disease control actions.

Classification of properties according to the above criteria is an important part of EAD control and eradication. Any restrictions that apply to a classified property will be fully explained by the disease control authority at the time of classification.
1.8 Training in emergency animal disease preparedness

The National EAD Training Program, managed by Animal Health Australia, provides training for livestock producers, veterinarians, other government personnel and representatives of the Australian livestock industries. The program’s purpose is to prepare people for roles they may undertake in an EAD response. Each livestock industry ensures that there is a pool of skilled people trained to work as ILOs and industry liaison coordinators. It is a requirement of the EADRA that, where possible, jurisdictions use accredited, trained staff to combat an EAD.

2 Nature of the enterprise

Risk enterprises are those with a high potential for disease spread or for economic loss during an outbreak of an emergency animal disease (EAD). The 11 poultry-related enterprises considered in this manual all qualify because they have large numbers of live birds, or there is movement of birds, product, materials or people that could carry virus. Many are also large-scale enterprises with high economic value.

This manual deals with enterprises in the commercial chicken (meat and egg) industry, and the commercial duck (meat) industry, which have large numbers of susceptible birds. It does not deal in detail with the other poultry industries, such as turkeys, or with backyard or fancier poultry keeping. Backyard poultry typically involves smaller numbers of birds and thus poses less economic risk.

The turkey industry is primarily managed in a similar way to the chicken industry, and thus much of the information and advice in this manual will apply to them. Some information may also apply to other industries, such as the ratite and bird fancier groups; however, the overall management and structure of these industries differ significantly from those of the chicken, duck and turkey industries.

Three diseases are considered in this manual:

- avian influenza (highly pathogenic avian influenza; and low pathogenicity avian influenza, subtypes H5 and H7)
- Newcastle disease
- infectious bursal disease caused by very virulent or exotic antigenic variant subtypes.

These diseases are absent from commercial poultry in Australia and are classified as EADs in the Australian Veterinary Emergency Plan (AUSVETPLAN). Most avian species are considered to be potentially susceptible to infection with all of these viruses, but the diseases may be clinically inapparent in some species.

The three diseases are included in the EAD Response Agreement (EADRA) (see Section 1.4).

2.1 The poultry industry

2.1.1 Chickens

A comprehensive review of the structure and dynamics of the Australian poultry industry has been undertaken for the Australian Government Department of Agriculture, Fisheries and Forestry by Scolexia Animal and Avian Health Consultancy (2009). The poultry industry is based on the production of two types of product: eggs and meat. There are many interconnections between the egg and poultry meat sectors. A few breeding enterprises produce day-old chicks of either egg or meat types. The layer type is used to produce table eggs, while the meat type produces meat (‘broiler’) chickens. The two industries may operate from a common base of breeders (usually on well-separated farms), stockfeed mills, equipment, and vaccine and pharmaceutical suppliers. Although different strains of birds are used in the two sectors, and commercial farms produce either meat chickens or table eggs (but not both), broiler and layer farms are often geographically close
and share a number of infrastructure elements. Therefore, spread of infection from one industry to the other is likely.

A number of areas in Australia have a high concentration of poultry populations, with many farms adjacent to one another. Consequently, there is a high chance of an EAD spreading from farm to farm.

The poultry industry is aware of the danger of disease transmission and practises a high level of biosecurity. Commercial farms restrict entry of people, machinery and vehicles, and require visitors to wear overalls or dust coats and to put on overshoes — usually lightweight plastic, disposable shoe covers. Breeder birds are usually protected to a higher degree than commercial grow-out birds, with more restricted access granted to visitors and adoption of shower-in and shower-out practices.

Both the egg and meat industries principally supply domestic markets. However, there is a small but significant export market for hatching eggs, live birds, poultry meat and egg products, which would be curtailed by an EAD outbreak.

The chicken egg industry

The Australian Egg Corporation Limited (AECL) is the peak organisation for the egg industry. Statistics for the egg industry can be found on the AECL website.\(^5\)

Eggs are produced by hens of specially selected layer breeds. The eggs of other avian species are not often used for human consumption. Australians eat about 210 chicken eggs per person per year. These eggs are worth $447 million at the farm gate and are produced by 15.12 million layer hens on about 332 farms. About 4.7 million pullets are reared on egg farms or by started pullet contractors. Farms are located either on the outskirts of the major metropolitan areas close to the major city markets, or around a few country centres close to feed sources. Approximately 68% of commercial egg production is sourced from caged layer farms, with the remainder produced on free-range or barn layer farms, using deep-litter or slatted-floor systems. Approximately 15% of Australian egg production is from backyard flocks. Between 6% and 7% of households in Australia have a backyard flock.

Layer hens are reared to maturity (15–17 weeks) in a rearing shed. When reared on a separate farm and sold to the producer at point of lay, they are called ‘started pullets’. Adult hens are kept in production for about 15 months.

Hen eggs are produced in all states, with:
- 34% of farms and 39% of hens in New South Wales and the Australian Capital Territory
- 23% of farms and 24% of hens in Victoria
- 18% of farms and 23% of hens in Queensland
- 10% of farms and 3% of hens in South Australia and the Northern Territory
- 11% of farms and 9% of hens in Western Australia
- 4% of farms and 1% of hens in Tasmania.

Egg production is in the hands of individual producers or family companies. Since deregulation in recent years, the number of farms has decreased, but the size of farms has

\(^5\) www.aecl.org
increased. As a result of recent consolidation of ownership, 67% of the laying hens are on farms that carry more than 100,000 hens each (14% of farms are of this size), and 10.5% of the laying hens are on farms that carry less than 10,000 hens each (62% of farms are of this size).

Layer farms vary in size, but the average is about 51,420 hens. Four companies have more than 1 million laying hens each, spread across a number of sites.

The chicken meat industry

The Australian Chicken Meat Federation is the peak organisation for the chicken meat industry. The federation’s website has statistics on the industry.6

The chicken meat industry produces more than 550 million chickens per year (ABS 2011), and the gross value of poultry meat is $2719 million (ABARES 2011). New South Wales produces 34%, Victoria 24%, Queensland 19%, South Australia 13%, Western Australia 9% and Tasmania 1% of Australia’s chicken meat. Average annual consumption of poultry meat in Australia is 43.9 kg per person, based on Australian Bureau of Statistics data on chicken meat production and exports, and the Australian population (as at 31 December 2010). Chicken meat represents about 95% of all poultry meat produced and consumed in Australia.

Figure 2.1 shows the location of facilities for chicken meat production in Australia. This map and others in this section were produced using a Google Earth-based display system that allows interactive display of all facilities, and movements of inputs and outputs by type and by processor.

6 www.chicken.org.au
2.1.2 Ducks

The duck industry is based on the production of duck meat, with a small amount of eggs sold for human consumption. A few breeding enterprises produce day-old ducklings of only meat-type ducks, unlike the chicken industry, which has both a meat (broiler)-type and a layer-type chicken. Saleable eggs are the excess eggs produced by the duck meat breeder operations, and consequently are not a focus of the industry.

Two main areas of Australia have high concentration of duck populations; these are the Sydney Basin (New South Wales) and the Wimmera region (Victoria). In the Sydney Basin, farms are relatively close together, and the risk of an EAD spreading from farm to farm is high. Also, since there are many chicken farms in the Sydney Basin, there is also a chance of disease spreading between the duck and chicken industries.

The Australian Duck Meat Association Incorporated is the peak organisation for the duck meat industry.
The duck meat industry produces more than 10 million ducks per year, and the gross value of duck meat is approximately $120 million. New South Wales produces approximately 55% of duck meat and Victoria the remaining 45%; other states produce minimal duck meat. Average annual consumption of duck meat in Australia is approximately 1 kg per person.

2.1.3 Movement of live poultry and products

Live poultry, eggs and poultry products are moved widely throughout the country, often across state borders. There is also a small but significant export industry for fertile (hatching) eggs, day-old chicks, and meat and egg products.

The chicken meat industry is highly vertically integrated, with processing plants, hatcheries, stockfeed mills, breeder farms and meat chicken farms often owned by a single company. Within the individual companies, there is significant movement of live poultry, hatching eggs and meat products. There is less movement between the different companies.

The commercial egg industry is less vertically integrated. Egg production farms, egg-grading floors and product processing plants may be owned by individual, but sometimes quite large, companies that may also be horizontally integrated (owning a number of separate farms). The larger companies compete for the same markets, so overlaps occur in movements of chicks, started pullets and eggs.

Duck products are mainly moved within the state in which the product is produced (ie product produced in New South Wales is moved within New South Wales, and product produced in Victoria is moved within Victoria). Product is also moved interstate from New South Wales and Victoria to other states. There is a small export industry for duck products out of Australia. Processing plants, hatcheries and breeder farms are often owned by a single vertically integrated company. Duck meat farms are usually either integrated into these companies, or are sourced from independent contract farmers.

2.1.4 Veterinary services

Some integrated meat chicken organisations have their own laboratory and veterinarian(s), whereas other meat chicken and layer, and duck meat, companies use university, government or privately owned laboratories, and consultant or government veterinarians.

Service staff, who are often supervised by, or report directly to, a veterinarian, are employed by enterprises such as processing companies, feedmills and medication suppliers, and can also provide frontline advice to farmers on husbandry, feeding, hygiene and biosecurity. Veterinarians are involved in staff training programs.

2.1.5 Feed

Many stockfeed mills are owned by integrated chicken meat companies to supply their own farms, contract farms and, in some cases, the farms of other companies, but some independent mills remain. The duck meat industry sources its stockfeed from either these larger, highly integrated chicken meat companies or independent stockfeed mills. All compete for the same market, resulting in many opportunities for cross-infection via feed trucks. Better designed breeder farms have feed delivery points (auger or blower intakes)

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located outside the perimeter fence, eliminating the need for feed trucks and drivers to enter livestock areas.

Figure 2.2 shows the location of feed mills and movements of feed to meat chicken farms in southeast Australia.

Figure 2.2 Feedmills (green dots) and feed delivery to farms (green lines) in southeast Australia (feed from Brisbane is also delivered to the northern Queensland growing areas)
2.1.6 Waste disposal
Because poultry waste is a potential source of infection for endemic diseases, precautions are usually taken with its disposal.

Dead birds are usually collected by a commercial operator, and then incinerated, buried, composted or rendered. Plant effluent is treated in a two or three-stage system, then sprayed on pasture or passed to a sewer. Offal from the plant may be transported to an off-site pet food manufacturer or to a renderer. Litter may be reused in a shed for several batches of poultry.

A high mortality on a farm may overload the disposal system and lead to carcasses being held in an inadequate manner for a lengthy period. In such circumstances, biosecurity will need to be maintained, and environmental contamination and odours controlled (see the Disposal Operational Manual).

2.2 Description of enterprises
The 11 poultry-related enterprises of concern in EAD preparedness and control are:
- post-entry quarantine facility — hatchery and farm
- primary breeding (great-grandparent/grandparent) farms
- parent breeder farms
- hatcheries
- meat bird (broiler) farms
- poultry meat processing plants
- layer (table egg) farms
- egg product processing plants
- stockfeed mills
- diagnostic laboratories
- free-range egg layer and chicken meat farms.

Each of these establishments faces different issues in EAD preparedness and control. This manual seeks to provide a uniform approach to the interrelated problems of the whole industry, while addressing the specific problems of each establishment in detail.8

2.2.1 Post-entry quarantine facility — hatchery and farm
There are currently a small number approved post-entry quarantine facilities for the importation of poultry hatching eggs into Australia. These facilities consist of a small hatchery and an adjoining bird-rearing area. Fertile eggs, imported under permit after stringent testing for exotic disease, are hatched in these facilities, along with specific pathogen free eggs. After hatch, the birds are reared under strict biosecurity until passing tests for exotic disease. Birds are usually released from these farms at around 10 weeks of age.

These farms are audited and supervised by staff from the Australian Government Department of Agriculture, Fisheries and Forestry (DAFF), and managed under very high levels of biosecurity and hygiene, including HEPA filtration of incoming and outgoing air for a period after importation. The eggs and birds on these sites are very valuable, high-level breeding stock, typically great-grandparent generation.

2.2.2 Primary breeding (great-grandparent/grandparent) farm

Primary breeding farms are where the major chicken meat and egg breeding companies locate their great-grandparent and grandparent breeding stock. There is a relatively small number of such farms in Australia. Generally, the breeding stock of the great-grandparent generation has been imported from overseas, as fertile eggs, either through a government or company-owned post-entry quarantine facility before placement onto these farms.

The primary breeding flocks may be the great-grandparent or grandparent birds to the commercial poultry flock. Loss of production of these flocks in an EAD outbreak would seriously disrupt the production chain of the companies and wider industries involved. Special arrangements may be needed to allow these flocks to produce progeny before a quarantine or destruction order is placed on them.

The primary breeders (great-grandparent and grandparent) birds have a much higher value than parent breeders. Primary breeder farms implement a higher level of isolation (quarantine) procedures, reflecting the high value of the birds and the potential economic flow-on effect of a disease outbreak affecting grandparent and great-grandparent breeders on a company and the relevant industry’s total operation.

2.2.3 Parent breeder farm

The next generation in the multiplication process is the parent breeders. These are the parents of the commercial birds used for meat or egg production. Fertile eggs from these flocks may be transported great distances to hatcheries, and often across state borders.

Although of less value than primary breeders, parent breeders are critical to the continued supply of meat and layer chickens to the poultry industry. Because the volume of eggs they produce is finely tuned to meet industry requirements, any quarantine or disruption of these farms will have an immediate impact on commercial farm placements. Some breeder farms are run as large complexes, resulting in multi-aged populations, although age groups are well separated and operate under high levels of biosecurity and hygiene.

2.2.4 Hatchery

A relatively small number of hatcheries supply nearly the whole industry. Many day-old chicks travel great distances, including across state borders, as illustrated in Figure 2.1 (yellow lines) in Section 2.1.1.

A hatchery is usually on a separate property from the breeder farm. Before being sent from the breeder farm to the hatchery, in a thermally insulated truck, the fertile eggs may be fumigated (sanitised). At the hatchery, the eggs are received in an egg-handling room, which may include a fumigation chamber where they are fumigated to kill bacteria on the shell. Before setting, chicken eggs may be stored in a coolroom at 12–18 °C for up to 14 days, with a 1% loss in hatchability per day from 7–8 days onwards. The eggs are incubated in a setter machine for 18 days and then transferred to the hatcher machine for the last 3 days. At this point, eggs may also be vaccinated using Embrex’s Inovoject
POULTRY-17-FINAL(16Mar17)

machine; duck eggs are not vaccinated. Some chicks may start ‘pipping’ or hatching through the shell at 19 days.

Some of these figures differ for ducks. Before setting, duck eggs may be stored in a coolroom at 14–16 °C for up to 14 days, with a 1% loss in hatchability per day from 10 days onwards. The duck eggs are incubated in a setter machine for 24–25 days and then transferred to the hatcher machine for the last 3–4 days. Some ducklings may start ‘pipping’ or hatching through the shell at 26 days.

The hatcher trays are taken to a separate chick/duckling-handling room, where the chicks or ducklings are sorted, sexed (in some commercial meat chicken operations), vaccinated and beak treated (layers), and cull or chicks surplus to requirements are destroyed. Day-old male layer-strain chicks and other cull chicks are euthanased at hatching in accordance with national welfare codes. The selected hatched chicks or ducklings are vaccinated and placed in plastic crates (or sometimes cardboard boxes) for transport to the farm. Plastic crates are sanitised before reuse, but cardboard boxes should be left on the farm and not reused because they are difficult to decontaminate.

Chicks or ducklings are held for as little time as possible in the hatchery and quickly delivered to the farm where they will be reared. Parent breeder chicks may be held for up to 24 hours, depending on transport and flight arrangements. The chicks or ducklings can be transported satisfactorily for up to 3 days without food and water if kept at the correct temperature.

Hatchery debris consists of unhatched eggs, egg shells and destroyed chicks or ducklings. These can cause a disposal problem, but are usually transported by industrial waste disposal contractors to approved landfill or to render.

Figure 2.3 shows the location of meat chicken hatcheries and meat chick movements in southeast Australia.
2.2.5 Meat bird farm

Chickens

Most meat chicken rearing is conducted by individual producers who have contracts with processing companies. The average farm has three or four sheds, and a holding capacity of about 100,000 birds. The contract grower owns the land, shed and equipment, and is paid a
rearing fee by the processor, who owns the chickens and the feed and provides the veterinary support.

Two rural investment companies own about 10% of meat production capacity, comprising several very large farms (with more than 20 sheds per farm).

Most processors are vertically integrated companies with ownership of the parent breeding and hatching operation, feedmills, processing plants and wholesale marketing. Some processing companies also have their own growing facilities managed by employees.

Figures 2.4 and 2.5 show the location of broiler farms in southeast Australia.

Day-old chicks delivered to the farm from the hatchery are provided with a supplementary source of heat for the first 3–4 weeks of life. From around 5 weeks of age, they are taken to a processing plant for slaughter. In the event of an EAD (or other emergency situation), it is not feasible to hold the birds on the farm for long, as they soon become overcrowded and can be stressed and even die, especially in hot weather.

Meat chickens are caught and transported to the processing plant. Pick-ups may occur on more than one farm on any day. To reduce the risk associated with disease spread to farms picked up later in the day, pick-ups are usually scheduled so that young flocks are visited first and the oldest flocks last.
Figure 2.4 Location of broiler farms in Victoria, New South Wales and southern Queensland. Blue lines represent the flow of chickens to the processing plants (see also a close-up showing the Sydney Basin in Figure 2.5)
Ducks

As for chickens, most meat duck rearing is by individual producers who have contracts with processing companies. The average farm has three or four sheds, and a holding capacity of about 35,000 birds. Some processing companies also have their own growing facilities.

Two systems are used between processors and growers:
- The contract grower owns the land, shed and equipment, and is paid a rearing fee by the processor, who owns the ducks and the feed.
- The contract grower owns the land, shed, equipment and feed, and buys the ducklings of the processor, who buys the grown duck back at a price per kilogram.
Day-old ducklings delivered to the farm from the hatchery are provided with a supplementary source of heat for the first 2–3 weeks of life. From around 6 weeks of age, they are taken to a processing plant for slaughter.

As with chickens, meat ducks are caught and transported to the processing plant. Pick-ups may occur on more than one farm on any day. To reduce the risk associated with disease spread to farms picked up later in the day, pick-ups are usually scheduled so that young flocks are visited first and the oldest flocks last. Pick-up trucks are cleaned and sanitised before going on to another farm on the same day.

### 2.2.6 Poultry processing plant

The products from the primary processing plant are generally raw; they may be chilled or frozen, and presented as whole carcases, cut-up pieces, filleted products or meat stripped from the bone. Most of the market for raw chicken meat is for chilled product, whereas a larger proportion of the further processed poultry is for frozen product. Finished product is usually stored in chillers or freezers on the premises for as little time as possible — chilled product has a short shelf life (7–10 days), and storage for frozen product is expensive. Some further processed products have a shelf life of up to 24 weeks. Raw products may be moved to another processing enterprise for further processing into raw, flash-fried (par-cooked) or fully cooked poultry products.

The parts not suitable for human consumption may be used for pet food or rendered into poultry meal or feather meal. Duck feathers may also be used to create down, in which case excess feathers are transported from the processing plant to a down production facility.

Pet food or rendering plants may be on the processing plant premises, and recontamination of rendered material may be a problem. A rendering plant may receive offal from a number of distant processing plants, and in turn supply meals to several feed mills. Alternatively, offal may be transported from the processing plant for pet food manufacture or rendering at another site.

The effluent from poultry processing plants is treated in a manner approved under environment protection legislation before it is used for fertiliser or goes to the sewer.

### 2.2.7 Layer (table egg) farm

Layer farmers may rear their own chicks from day-old chicks or may purchase birds at about 16 weeks of age from a started pullet rearing specialist. The flock starts to lay eggs of marketable size at about 18 weeks of age and continues to lay for the next 15 months. Birds no longer required for a laying cycle (‘spent’ hens) are sold to a processing plant, or euthanased and composted. The usual age for depopulation is around 74 weeks.

Programmed lighting in sheds for layer hens eliminates the effect of seasonal variations in light and dark periods, and allows for greater consistency in supply.

Eggs are usually graded and packed on the farm before being sent to the market, but may go to a separate establishment for grading and packing. Most eggs are sold within an in-line distribution system, which has limited ability to store eggs. Eggs usually reach a customer or distributor within 2–3 days of laying. The ‘best before’ period for shell eggs is 42 days from date of pack, and many distributors ensure optimum supply chain conditions. The recommended temperature for egg storage is below 15 °C (±3 °C), under conditions that avoid surface condensation or contamination.
2.2.8 Egg product processing plant
Most eggs are sold as whole shell eggs, but lower quality or surplus eggs are sent to an egg processing plant to be broken out of the shell and turned into egg white, egg yolk or whole egg pulp. These products must be pasteurised (or equivalently treated), and may be frozen or dried. Finished product is usually stored on the premises.

Surplus fertile eggs from primary breeder and parent breeder farms (small, double yolk, excess production, etc) may also be sent to egg product processing plants for human consumption.

2.2.9 Stockfeed mill
Stockfeed mills use cereal grains, vegetable and animal protein meals, and various additives to produce finished poultry rations. Some mills make feed for a number of livestock industries, while others specialise in poultry feed.

The feed trucks that travel from farm to farm are possible carriers of infectious organisms. This risk is lower in breeder farms that have a special feed delivery point outside the perimeter fence of each shed.

2.2.10 Diagnostic laboratory
Many large meat chicken enterprises have their own diagnostic laboratories, although these laboratories are becoming more focused on food-quality testing. Some primary breeder farms, smaller meat chicken enterprises, duck meat enterprises and layer farmers use state government, university or privately owned laboratories. Laboratories could be a focus of infection for poultry diseases through staff who visit farms or other laboratories without using appropriate biosecurity precautions.

2.2.11 Free-range egg layer and chicken meat farms
Commercial free-range farms are a recent development in Australia, but now provide an estimated 30% of egg production and 15% of chicken meat production. Free-range egg farms may allow pullets and hens access to outdoor paddocks for most of the daylight hours and only house the flocks overnight to avoid predation. Free-range broiler flocks have access to an outside run during daylight hours once they are fully feathered (ie 3–4 weeks old).

Free-range farms have limited protection from contact with wild birds, wild animals, vermin and windborne infection, and hygiene can prove difficult. The occurrence of endemic viral diseases, such as egg drop syndrome, in Australia highlights the risk of these types of flocks contracting an EAD through contact.

2.3 Legislation and codes of practice
Each state and territory has legislation controlling the design and operation of poultry processing plants. This legislation is intended to maintain good hygiene and protect consumers.

The poultry industry is also subject to animal welfare legislation in each state and territory.
2.3.1 Biosecurity codes

The National Farm Biosecurity Manual – Poultry Production (DAFF 2009a) has been developed to ‘establish a minimum set of biosecurity standards, applicable to all poultry producers’. The duck meat industry has its own biosecurity manual, Farm Biosecurity Manual for the Duck Meat Industry (AHA 2011), which was developed by Animal Health Australia and the Australian Duck Meat Association, in collaboration with major processors.

In addition, both the chicken meat industry and the egg industry have developed biosecurity codes in recent years. Copies of the industry codes are available through the respective industry websites. Both industries have progressively implemented the codes, and the egg industry has appointed independent auditors to evaluate compliance via its quality assurance program. Chicken meat enterprises are registered and audited by processors under their contracts with growers.

The AECL has established Egg Corp Assured (ECA), a national egg quality assurance program designed to help commercial egg producers develop an approved quality assurance program for their business and be recognised for doing so. The ECA program is currently undergoing a review and update, which will also include a name change; details of the new program will be available on the AECL website.

2.3.2 Welfare codes

The Australian Model Codes of Practice for the Welfare of Animals include a welfare code for domestic poultry, currently in its fourth edition. In some states, the welfare code (or parts thereof) has been incorporated into the relevant state or territory legislation. Even if it is not incorporated, the standards in the code are accepted as representing practices that achieve acceptable poultry welfare outcomes. The Australian Animal Welfare Standards and Guidelines for the Land Transport of Livestock were adopted in 2010.

Handling and killing of birds to be slaughtered as part of an EAD eradication program is to be done with animal welfare in mind, and in a manner that produces minimal distress and results in rapid death.

2.3.3 Other guidelines and procedures

The requirements of local governments and environment protection agencies will apply to disposal of manure, waste and effluent. Some states have produced a set of poultry farming guidelines that show producers how to conform with such requirements. Each enterprise will have its own operational procedures, but many will not have these in a written form.

Occupational health and safety rules for the establishment should be available in a written form.

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10 www.aecl.org/egg-corp-assured
12 www.animalwelfarestandards.net.au/land-transport
2.4 Emergency diseases of concern

The three major EADs of poultry that are of concern to Australia are:

- avian influenza (AI) in its highly pathogenic form, and also low pathogenicity AI of virus subtypes H5 and H7
- Newcastle disease (ND) in its classical virulent form
- infectious bursal disease (IBD) caused by very virulent IBD virus or exotic antigenic variant strains of IBD virus.

Most avian species are considered susceptible to infection by the viruses that cause these diseases, but many species do not develop any signs of disease. IBD virus has not been known to cause clinical disease in poultry or avian species other than chicken.

The diseases could enter Australia through illegal means (such as smuggling of birds or their products), through wild birds, on fomites (inanimate objects capable of carrying the agent), via mutation from endemic viruses or by sabotage using disease agents.

2.4.1 Avian influenza

AI (once also known as ‘fowl plague’) is a lethal, highly contagious viral infection, mainly in chickens and turkeys, caused by specific types of AI virus, primarily the H5 and H7 subtypes. Ducks, geese, guinea fowl, quail, pheasants, partridges and ratites (such as emus) can be affected. Symptoms range from inapparent in waterfowl, to a rapidly fatal condition characterised by gastrointestinal, respiratory and/or nervous signs in chickens and turkeys. Signs of the disease also include blue discolouration (cyanosis) of the comb and wattles. Egg production drops occur in laying poultry.

AI infections in poultry can be caused by any of a number of AI virus subtypes and show a continuous spectrum of pathogenicity (severity of symptoms), from lethal highly pathogenic AI (HPAI) to low pathogenicity AI (LPAI). LPAI infections caused by virus subtypes H5 or H7 are EADs because of the possibility that the virus could mutate into one with higher pathogenicity, which might also become transmissible to and between humans. Other LPAI viruses can also occasionally cause disease in poultry.

Many wild species, particularly waterbirds and ratites, are susceptible to infection with AI virus. Infections in waterfowl, in particular, are generally subclinical (without observable symptoms), but the birds can be carriers of the virus, especially LPAI subtypes H5 or H7. LPAI H5 or H7 viruses can cause clinical signs of disease in poultry, especially in association with other diseases, but a more significant factor is that they can mutate to HPAI H5 or H7 when infection of flocks occurs.

Outbreaks of AI due to HPAI H7 viruses occurred in commercial chickens in Australia in 1976, 1985, 1992 (all in Victoria), 1994 (in Queensland), and 1997 and 2012 (in New South Wales), but all were subsequently eradicated by slaughter and testing. There was also an incidental finding of LPAI (H5) in the duck industry in Victoria in 2012 and in a single duck in Western Australia in 2013, which was eradicated with slaughter and testing. It is very likely that the AI virus was introduced by wild waterfowl in each case. Testing of waterfowl has not led to isolation of the virulent virus, but influenza viruses are unstable and prone to change from nonpathogenic to pathogenic forms as a result of recombination of various parts of their genome.
2.4.2 Newcastle disease

ND is a highly contagious and lethal viral disease of chickens, turkeys and other birds. Virus strains vary in pathogenicity from nonvirulent to highly virulent. Highly virulent strains cause rapid death and are characterised by respiratory disease, nervous signs, drops in egg production, and bleeding in the trachea and intestinal tract.

ND occurred twice in Victoria in the early 1930s, due to an exotic virulent strain of the virus. Nonpathogenic strains, such as the V4 strain, were detected in 1966 and became widespread. More recently, the disease occurred in New South Wales in 1998, 1999 and 2000, and in New South Wales and Victoria in 2002. All outbreaks from 1998 onwards were caused by an Australian-origin strain of ND virus that underwent mutation, and not an exotic virus. No outbreaks in chickens have occurred since 2002.

Vaccination against ND has been mandatory in all jurisdictions for many years under a national management program. The vaccination program aims to displace the Australian-origin nonpathogenic precursor strains of ND virus that have sequences close to the virulent sequence and that might result in the emergence of virulent ND virus of Australian origin. The goal of mandatory vaccination is therefore to reduce the risk of an outbreak of Australian-origin ND.

Although there have been no outbreaks of Australian-origin ND since compulsory vaccination commenced, the continued presence of the nonpathogenic precursor strains of ND virus cannot be excluded. Both vaccination and infection with nonpathogenic ND virus stimulate an immunological reaction that will provide protection against the disease and prevent signs of the disease from developing, but will not necessarily prevent infection.

Furthermore, because the vaccine and Australian-origin nonpathogenic ND viruses stimulate an immune reaction, birds that have been vaccinated or exposed to the Australian-origin nonpathogenic viruses will be serologically positive, which will complicate the surveillance phase of an outbreak. As a result, detection of virus by polymerase chain reaction and sequencing to determine pathogenicity, or isolation of virus and testing of its pathogenicity may be necessary to determine the true status of a flock.

2.4.3 Infectious bursal disease

IBD is an acute, contagious viral infection that causes immunosuppression, disease and mortality in 3–6-week-old chickens. The virus infects certain types of white blood cells, leading to immunosuppression of varying duration and severity, and increased susceptibility to secondary viral and bacterial infections. Strains of IBD virus can be classified as attenuated (vaccine), classical (standard), antigenic variant and very virulent (also known as hypervirulent). Both classical and antigenic variant (serotype 1) strains exist in Australia; these are genetically different from the classical, antigenic variant and very virulent strains found overseas.

Active antibody to the endemic Australian strains will be found in many flocks in Australia. Breeding flocks are vaccinated with live and inactivated IBD vaccines of classical and antigenic variant (serotype 1) to confer protective passive antibody on their progeny.

The endemic classical and variant serotype 1 viruses in Australian poultry flocks are associated with disease that is usually subclinical. They cause immunosuppression and atrophy of the bursa of Fabricius (a specialised lymphoid organ of birds), with occasional haemorrhage and swelling of the bursa, but do not generally cause mortalities. Disease
occurs after a decline in passive immunity (maternal immunity, acquired from the breeder hen and passed to the chick in the egg).

The very virulent strains of IBD virus, which are not present in Australia, are associated with acute clinical disease and high mortality rates. Clinical disease caused by a more virulent classical strain would be likely to appear after a short incubation period (usually 2–3 days). Clinical signs in the acute phase of the disease due to very virulent IBD virus include anorexia, anaemia, watery diarrhoea and ruffled feathers. The mortality observed in Asia with very virulent IBD was generally 5–40% in layer strains and 3–5% in broiler strains. However, in severe cases, losses reached 60% in layers and 25% in broilers.

‘Antigenic variant’ strains of IBD virus are a distinct immunogenic type that can replicate and cause lesions in the bursa of birds in the presence of immunity to classical viruses. Exotic antigenic variant strains of IBD virus produce no obvious clinical signs of IBD; the main effect of infection is profound immunosuppression. Chickens infected with these strains show poor performance, including reduced weight gain, high feed conversion, poor response to vaccination, and increased susceptibility to secondary viral and bacterial infections, particularly respiratory infections. The strains do not cause characteristic clinical signs that would be easily recognised as being caused by an EAD agent.

2.4.4 Incubation period and diagnosis of AI, ND and IBD

The incubation period for AI, ND and IBD may be very short, only a few days, but can be delayed for 2 weeks. Because of the chance of such a long incubation period, the accepted critical period before signs are first seen has been set by the World Organisation for Animal Health (OIE) at 21 days for AI and ND, and 7 days for very virulent IBD.

All three diseases may be confused with other diseases endemic to Australia, making differential diagnosis difficult. This is particularly the case for ND — the nonpathogenic form of the virus may be found as a result of isolation attempts, or the pathogenic form may be disguised in birds that have been vaccinated or already exposed to the nonpathogenic virus. Similarly, the presence of antibody to IBD virus from exposure of birds to endemic classical and antigenic variant strains of IBD virus, or from vaccination of most breeding flocks in Australia may make diagnosis of IBD caused by very virulent and exotic variants much harder. The disease may also be masked by secondary infections associated with the immunosuppressive effects of the virus.

Differential diagnosis of all three diseases must include consideration of the following diseases and conditions that occur in Australia:

- infectious laryngotracheitis
- pasteurellosis (fowl cholera)
- botulism
- acute poisoning
- colibacillosis (E.coli septicaemia or cellulitis of the head)
- mycoplasmosis
- coryza
- other paramyxovirus infections
- acute coccidiosis
- infectious bronchitis
• Marek’s disease
• egg drop syndrome 76
• stress, water deprivation and intoxication
• ventilation failure, high temperatures and gas leakage
• blackhead
• spotty liver
• other exotic diseases, such as
  – turkey rhinotracheitis virus
  – Ornithobacterium rhinotracheale
  – duck virus enteritis
  – duck virus hepatitis.

### 2.4.5 Potential occupational health issues

Some strains of AI are zoonotic. The most prominent strain, H5N1, has spread to many countries since 2004, infecting several hundred people. Mortality in infected humans is high — more than 50%. Indonesia, Vietnam and Egypt have recorded the highest levels of human casualties. An H7N9 virus was first reported to have infected humans in 2013 in China.

ND is a ‘zoonotic’ disease — that is, it can spread between animals (ie birds for ND) and humans. ND virus can cause a mild conjunctivitis and flu-like symptoms in humans. Although this has not been known to be an occupational health concern, it has the potential to become one. The spread of ND virus by infected humans is not recorded as being associated with spread of the disease in poultry, but it must be kept in mind. However, mechanical spread of infection by people is very important.

There is no evidence that IBD virus can infect other animals, including humans.

### 2.4.6 AUSVETPLAN strategy and OIE requirements

AI, ND and very virulent IBD all have AUSVETPLAN disease strategies based on ‘stamping out’ (the quarantine and slaughter of all susceptible birds that are infected or exposed to the disease). In this document, the three diseases are treated as one unless they have relevant and important differences, in which case the difference is mentioned.

The strategy for control of these diseases is:

• stamping out by slaughter of birds, and disposal of carcasses and products
• strict quarantine, movement controls, tracing and surveillance of contacts
• decontamination of materials on infected premises.

Where available, vaccination may be seen as a useful and cost-effective adjunct to stamping out alone.

Further details are available in the Disease Strategies for AI, ND and very virulent IBD.

The AUSVETPLAN Summary Document also provides relevant information.
2.5 Inputs — the risk of introducing disease

Direct contact with infected birds is the most likely source of infection for all three diseases. Mechanical transmission is also very important for ND and very virulent IBD. IBD is highly contagious, spreading through the movement of poultry products, equipment, feed bags, vehicles, people and, to a lesser extent, aerosols of dust.

Mechanical transmission is less important for AI. Although there is a possibility of mechanical transmission of AI by either invertebrate or vertebrate vectors through contact with infected faeces, such transmission would be infrequent.

Vaccination teams and pick-up teams used to catch live birds at farms must be constantly encouraged to practise good hygiene. Such teams may carry pathogenic organisms, and potentially EAD agents, from farm to farm. Their equipment is usually transferred between farms during the night, without cleaning, and they might not change clothing between farms. Pick-up staff are often casual workers, and the imposition of hygiene discipline is difficult, increasing the risk of disease transmission. The danger is less for meat chicken farms on final pick-up, where a clean-up and spelling period is normal practice.

For further information on inputs, see Section 3.5.

2.5.1 Live poultry and poultry products

Live birds and poultry products are considered possible sources of ND, AI and very virulent IBD viruses, all of which survive in carcasses, feathers, meat, eggs, offal, effluent and manure. However, Australia has strict conditions on the importation of fertile eggs, live birds (pigeons) and poultry products. Import protocols for hatching eggs, poultry meat and products, and eggs and egg products include procedures and tests to prevent the introduction of the viruses. See the Disease Strategy for each disease for more detailed information.

Wild waterfowl are considered the most likely source of AI virus. Sheds should be bird-proofed, and water sources should be either isolated from waterfowl or treated before use (see Section 3.9). Biosecurity precautions should be taken to prevent transfer of wild bird droppings into sheds on boots and farm equipment.

Smuggled birds, products or byproducts are considered to be possible sources of ND and very virulent IBD, but the re-emergence of virulent ND from Australian precursor ND viruses is now also recognised as a possible source of virulent ND. Secondary spread of infection from sick or dead birds going to a laboratory for diagnosis is possible if adequate precautions are not taken.

2.5.2 Feed

The feed used for poultry consists of grains (wheat, sorghum, barley — corn is not routinely used in Australia) as a source of energy and protein, and protein feeds, which may be supplied as vegetable protein meals (soybean, sunflower, canola, etc) or as animal protein meals (meat, fish, poultry, feather). Microingredients (vitamins and minerals) are supplied as separate items to be mixed at the mill or as a premix from a specialist mixing plant. The ingredients are ground finely, mixed together and presented as mash or pellets. Most feed for breeders and meat chickens is supplied in pelleted form. The heat involved in pelleting feed may reduce disease risk, depending on the time and temperature used, and appropriate handling of the feed to prevent recontamination after heat treatment. Most feed for the layer industry is supplied as non-heat treated mash.
Feed ingredients arrive in bulk rail or road trucks. Grains arrive from country silos. Vegetable protein meals come from oil-crushing plants and processing plants; some are imported in large quantities. Animal proteins come from rendering plants that are sometimes located at abattoirs (meatmeal) or at poultry processing plants (poultry and feather meal).

Some ingredients are delivered in plastic, multiwalled paper or hessian bags. New bags pose no risk, but reused bags may be contaminated.

A major outbreak of ND in the United Kingdom was caused by pigeons contaminating feed ingredients. Although the heat involved in pelleting might inactivate most viruses, IBD virus in particular is very resistant to thermal inactivation. Cross-contamination and recontamination with all three viruses are very real possibilities in most feedmills.

### 2.5.3 Vehicles and equipment

The viruses can be carried mechanically on any inert material, including vehicles and equipment. These are less likely to be a source of virus than infected birds, especially in the case of AI, but must be considered in planning preventive measures.

Live poultry are transported from farm to farm (eg started pullets, prebreeder ducks), from farm to processing plant (meat chickens, meat ducks or spent birds) and from hatchery to farm (day-old chicks) in reusable plastic crates that are normally sanitised after each use. Fertile eggs are transported from the breeder farm on trucks to the hatchery in plastic ‘filler flats’ (trays) stacked on metal trolleys. Both fillers and trolleys should be sanitised after each use. Occasionally, cardboard egg fillers and chick boxes may also be used. These should not be reused but should be disposed of on farm or in the hatchery, as they cannot be easily cleaned and sanitised.

### 2.5.4 People

People can carry the viruses on their clothing, skin and hair, and within the upper respiratory tract and eyes in the case of ND and AI viruses.

### 2.6 Outputs — the risk of spreading disease

For further information on outputs, see Section 3.5.

#### 2.6.1 Live poultry

**Marketable poultry and started pullets**

Live poultry pose the greatest danger of spreading disease agents.

In the Australian broiler industry, pick-up vehicles may visit several farms every night, and ‘part pick-ups’ to reduce bird density, in which only a portion of the birds in a shed are removed for slaughter, are common. Birds are transported to processing plants on trucks in open plastic crates or modules, and could disperse virus-laden feathers, dust and dander along the way. Normally, no live birds or products return to the farm, but contaminated vehicles might enter during part pick-ups.

Primary and parent breeder birds, chickens reared on a rearing farm until close to point of lay (usually around 15 weeks for layer breeds and 20 weeks for meat breeds), and prelayer
ducks (ducks reared on a prelayer farm until close to the age of lay, usually about 18 weeks), are then transported to layer farms. If disease is present on a rearing or prelayer farm, it will be transferred with the live birds to the layer farm. Primary breeder and parent breeder spiking males (young males reared to replace a proportion of the males in an older flock to improve fertility) may also move from a rearing farm to a layer farm and are a potential source of disease.

In some circumstances, usually in the layer industry, the farmer sells live poultry from the farm (including spent hens to backyard producers). Australia has only a few live bird markets, and most of these are not large, nor do they operate continuously. This differs from the situation in many other countries, where live bird markets are a major factor in dissemination of disease. However, live bird markets and auctions are associated with some risk of disease spread in Australia, especially as unsold birds may be returned to the farm after becoming infected at the market.

**Fertile eggs and day-old chicks**

There is some evidence of vertical transmission (from hen to egg) of ND virus, mainly through cracked or broken eggs, and fertile eggs can harbour AI virus during the early stages of infection of hens. However, there is no evidence that very virulent IBD virus can be vertically transmitted, although the virus can survive in dust on the surface of eggs that are not correctly sanitised.

Normal hatchery hygiene practices should adequately decontaminate the surface of eggs of many infectious agents. Therefore, day-old chicks moving from hatchery to farm pose only a low likelihood of spreading EADs. Hatchery waste, including egg shells, unhatched eggs, destroyed chicks and unwanted off-sex chicks are sent to a renderer or garbage tip. Unhatched eggs and chicks are first treated according to the relevant poultry welfare codes. Occasionally, small numbers of euthanased off-sex chicks are sent to schools to be used for teaching or to reptile parks as a food source.

### 2.6.2 Products

**Chicken and duck meat**

Chicken and duck meat may become contaminated in an EAD outbreak. Although it is extremely unlikely that contaminated chicken and duck meat would be fed back to poultry, it is possible that it may be fed to lower biosecurity poultry, such as backyard flocks.

**Eggs**

The level of contamination of the shell and contents is low, and the chance of recycling infectious organisms to poultry is not great. However, IBD virus is particularly resistant to environmental degradation, and egg-collection equipment and vehicles should be considered as possible vectors for IBD virus.

Eggs are graded and packed either on the farm or at a centralised packing station before being shipped for human consumption. Eggs retain full freshness for 21 days if kept below 25 °C. If they are kept at 4 °C, they are considered ‘usable’ for cooking or pulp making for 3 months.

At an egg product processing plant, egg pulp is processed into a number of products. Whole eggs, or egg whites or yolks may be converted to a liquid or powder. Liquid egg pulp is usually pasteurised and stored on the premises. Pasteurisation at recommended
temperatures of 55–66 °C will destroy AI viruses, but is not sufficient to inactivate most ND virus strains. IBD virus is most unlikely to be present in egg products in sufficient quantity to constitute a risk. Both frozen and dried product can be kept for long periods.

2.6.3 Byproducts
Recontamination of rendered material by untreated infected material is probable if storage facilities or plant design allow contact to occur. Rendering plants that have received material from a poultry processing plant involved in an EAD outbreak could be required to divert their entire product to nonpoultry outlets such as pet food manufacturers.

2.6.4 Effluent
Effluent from processing and egg-packing plants is treated and used as liquid fertiliser or disposed of as sewage. Egg and hatchery wastes are disposed of in garbage tips or are rendered. These effluent and waste streams may become contaminated, at least before any sterilisation treatment. Vehicles used for disposal of wastes may also become contaminated.

2.6.5 Manure
Poultry manure includes faeces and concentrated urine, with a high nitrogen content. Layer farm manure is too powerful for direct use as fertiliser, so commercial treatments (such as Dynamic Lifter) are used to compost and dilute it with other organic matter for use in domestic gardens as fertiliser. Manure from breeder and meat chicken or duck farms is mixed with litter (wood shavings, rice hulls, etc) and is sufficiently dilute for direct use, often on pasture. Sometimes manure from layer farms leaves the farm in bags or piles that are sold directly to the public, including farmers.

Manure or litter is likely to become contaminated in an outbreak situation. This risk is eliminated following composting, which inactivates the viruses.

2.6.6 Diagnostic specimens
Postmortems of birds are commonly performed on the farm by the farmer, serviceperson or veterinarian. In this case, the remains of specimens are usually incinerated, buried or composted with the normal farm mortality. When postmortems are conducted off site, remains are usually disposed of by clinical waste disposal operators.

Whole live or dead birds or tissue samples in containers can be submitted to company, government, university or privately owned diagnostic laboratories. Laboratory specimens and cultures must be disposed of by incineration, burying or approved clinical waste collection. Non-essential visitors, equipment, pets and wild birds must be kept away from the laboratory. Staff must adopt hygiene and other biosecurity precautions to prevent transmission of infections from laboratories to poultry farms.

The diagnostic laboratory can be a dispersal centre for infectious agents unless routine precautions are taken. Additional precautions are implemented during EAD outbreaks.

2.6.7 Bird carcasses
On farms, dead birds may be incinerated, buried or composted. However, many farms have their dead birds collected by a contractor, who may collect from a number of farms and then dispose of the carcasses to rendering plants, or to the garbage tip for burial, composting or incineration.
At processing plants, dead birds are rendered, either at an on-site rendering plant or following transport to an off-site rendering plant. Usually, there is only limited capacity to handle large numbers of dead birds.

2.6.8 People

People moving off properties can carry viruses on their clothing, skin and hair, and within the upper respiratory tract and eyes in the case of ND and AI viruses.

The highest risk personnel movements are of people who move from farm to farm on a regular basis, particularly people who monitor or investigate poorly performing poultry flocks. These people include farm service persons and veterinarians. Other people who move between farms on a regular basis and have direct bird contact include catching teams, vaccination crews, grading crews and transfer teams. Family members may own or manage different poultry farms (fathers and children, uncles, cousins, etc). Often, these family members assist each other to complete tasks on their individual farms — both in person and by sharing equipment — and this sharing of labour and equipment poses a particular risk of movement of EADs between farms.
3 Risk reduction and contingency planning

The information provided in this section must be read in conjunction with the following AUSVETPLAN manuals that contain current and detailed information:

- Summary Document
- Operational manuals
  - Decontamination
  - Destruction of Animals
  - Disposal
  - Public Relations
  - Livestock Welfare and Management
  - Valuation and Compensation
- Disease strategies (for major EADs).

The level of risk of transmission of an emergency animal disease (EAD) can be reduced in various poultry enterprises by taking some elementary precautions in design and operation. These precautions also help to prevent the spread of endemic diseases.

3.1 Design of the enterprise

Each poultry enterprise should be appropriately isolated from others to aid control of endemic diseases. Enterprise isolation will be an asset in the event of an EAD outbreak to help reduce the impact of the disease.

If premises are easy to decontaminate, they can be returned to normal operation more readily. Decontamination is easier if gross organic matter is reduced. Impervious surfaces such as metal or plastic are preferred to wood or fibreboard. Impervious floors (bitumen or concrete) are preferred to earth.

In an EAD outbreak, partitioning of establishments may be acceptable to the control authorities. Partitioning involves dividing the premises into sections, thereby isolating groups of birds or segregating product from different sources. The partitioned parts can then be subjected to different levels of control.

To facilitate partitioning, the poultry enterprise and its operational procedures should be designed to keep large distances between sheds or groups of sheds and to maintain the identity of product batches (whether the product is meat, eggs or chicks).

Details of design features that will assist disease control programs for each of the 11 poultry-related enterprises are given below.
3.1.1 Post-entry quarantine facility — hatchery and farm

All quarantine facilities are located in areas remote from commercial poultry production. All are managed under strict biosecurity, including HEPA air filtration, waste water treatment, and restrictions on entry and exit of personnel and equipment. These precautions mean that the likelihood of disease spread from one of these sites is very low.

3.1.2 Primary breeding (great-grandparent/grandparent) farm

Although the principles of risk reduction and contingency planning are the same for primary breeding flocks as for parent breeder farms (see Section 3.1.2), all the major poultry companies have taken steps to isolate their primary breeding farms. Many have bought surrounding land to reduce the potential for aerosol transmission of infectious agents, and to avoid the farm from being included in quarantine zones during EAD outbreaks. Because primary breeding farms often contain valuable imported stock, access is usually limited to employees. Access by other personnel during an EAD outbreak would require very rigorous screening of their previous movements.

3.1.3 Parent breeder farm

Distance from other poultry farms (at least 3–5 km) and between age-group sections on the farm (200–400 m) is the main defence against disease spread. Entry and internal movement of people, vehicles and equipment should be restricted, and biosecurity procedures should be followed when movement is necessary. Most breeder farms require people to shower before entry into the shed area. Vehicles and equipment should be kept off the premises or decontaminated before entry. Separate equipment should be provided for each area. Disposal of dead birds must be by incineration, burying or composting, or by commercial collection where the other methods are not allowed by environmental protection legislation.

Water from dams used by waterfowl is believed to be a significant potential source of avian influenza virus (DAFF 2009b). Town water should therefore be used if it is available. Otherwise, on-farm water supplies should be stored away from possible contamination by wild birds, or treated by filtration to remove organic matter (which inactivates disinfectants) and by chlorination to kill microorganisms (with at least 20 minutes contact time and 5 ppm of available chlorine). Ultraviolet light treatment or chlorine dioxide are other options to sanitise the water. Further information can be found in the National Water Biosecurity Manual – Poultry Production (DAFF 2009b).

Sheds should be proofed against wild birds and animals, vermin, pets and unauthorised people. Sheds should be designed to be easily cleaned and disinfected, with floors of concrete or bitumen rather than earth. There must be access for a ‘bobcat’ or other similar equipment to remove manure.

On-farm feed storage should be proofed against entry of, or contamination by, vermin, wild birds and animals. Most commercial farmers prefer bulk storage in securable silos, but some bagged feed is used, especially when feed is required in smaller quantities.

Potential mass-burial sites should be identified for possible use in an EAD outbreak. In many areas, burial of large numbers of dead birds or of large amounts of animal waste is not allowed.

3.1.4 Hatchery

Fertile eggs arrive at the hatchery in plastic or cardboard ‘filler flats’, which are transported in cardboard boxes or on metal trolleys. Cardboard fillers and boxes, which are usually
used for long-distance transportation such as by air, should not be reused, as they are difficult to decontaminate.

Hatchery design is based on a flow pattern from the ‘dirty’ end (egg receipt) through various stages to the ‘clean’ delivery point for the hatched day-old chicks, using separate rooms to keep contaminants from spreading.

Separation of egg batches by date of lay and by source flock, using marked cards on filler and incubator trays, is helpful for identification if problems arise.

Wastes (egg shells, euthanased chicks and unhatched eggs) are usually placed in sealable containers for transport to a tip or a renderer. Tip disposal is undesirable unless immediate burial is arranged.

Effluent (floor washings from the hatcher machines and chick-handling area) is disposed of through a treatment system, in which solids are filtered and added to the waste disposal, while liquids go to the sewer or to an envirocycle-style unit for use in irrigation.

3.1.5 Meat bird farm

Biosecurity is assisted by geographical separation of farms from other poultry farms. Entry restrictions on people, vehicles and equipment are also important. Other considerations are as described for breeder farms (Section 3.1.2). Ventilation systems, shed orientation and other aspects should be designed to minimise the transmission of aerosol infection from nearby sheds.

3.1.6 Poultry processing plant

Poultry meat processing plants must be built and operated to meet the requirements of state and territory legislation, which are based on the Australian Standard, Construction of Premises and Hygienic Production of Poultry Meat for Human Consumption (Standards Australia 2006). Preferably, design should include separation by at least 1 km from possible sources of contamination, such as live-bird facilities or diagnostic laboratories. Separation can be augmented by barriers such as trees.

A poultry meat processing plant normally consists of a single building with separate rooms for various elements of the process, with a flow pattern from heavily contaminated live-bird areas through to cleaner finished-product areas. These rooms are usually separated by a self-closing door for staff access and a small opening for the carcases to pass through.

Plants should be designed so that areas containing live birds (which can produce large outputs of virus in faeces and exhaled air) are physically separate from areas used for subsequent processing. Further separation between the scalding/defeathering area and the evisceration area is desirable, but not always possible in smaller plants. Separation between the evisceration area (with heavy faecal contamination) and the chilling/packing area is essential. Recontamination of clean materials or equipment by dirty items should be minimised by physical separation and hygiene practices.

Poultry from a particular farm usually arrive at the plant and are processed in a batch. Records are kept that allow identification of birds from a particular flock. This enables trace-back to source flocks and trace-forward to possibly contaminated product.

Offal and effluent handling must be planned to contain contamination. Crates and containers for live birds should be washed and sanitised before they leave the plant.
3.1.7 Layer (table egg) farm
Because many smaller layer farms have multi-aged flocks, often in the same shed, many of the principles of separation and between-flock hygiene cannot be practically applied. However, these principles should be kept in mind and applied by farmers whenever practical. Otherwise, the recommendations are as for breeder farms (see Section 3.1.2). In addition, provision should be made for suitable disposal of broken eggs.

3.1.8 Egg product processing plant
Batches of eggs from a particular supplier should be identified during processing and storage to enable tracing. Waste disposal should be hygienic.

3.1.9 Stockfeed mill
The stockfeed mill should be designed to separate feed ingredients from finished product. If the plant produces pelleted feed, contamination of finished product by raw materials should be prevented. The main risk of spread of EAD agents is by vehicles and drivers moving from farm to farm.

3.1.10 Diagnostic laboratory
Non-essential people (especially service personnel and farmers) and animals must be excluded from the laboratory. Carcasses and specimens should preferably be disposed of by incineration.

Staff should adopt routine hygienic practices. Contaminated areas (especially holding areas for live and dead bird specimens, and the postmortem room) should be washed and sanitised at least daily when in use (see the Laboratory Preparedness Manual).

3.1.11 Free-range egg layer and chicken meat farms
Unfortunately, the nature of free-range enterprises may allow access to poultry by wild birds, feral animals, vermin and their faeces for a significant part of each day. Some of these farms have multi-aged flocks, often in adjacent paddocks, so many of the principles of separation and between-flock hygiene cannot be practically applied. However, these principles should be kept in mind and applied by farmers whenever practical.

Common access by poultry and free-flying waterfowl to surface water in dams or in paddocks should be avoided. Dams should be netted or drained, and nesting habitat removed.

Sheds should be designed so that flocks can be contained during an EAD outbreak. Otherwise, the recommendations are as for breeder farms (see Section 3.1.2). Sheds should be proofed against wild birds and animals, vermin, pets and unauthorised people. Sheds should be designed to be easily cleaned and disinfected.

3.2 Procedures for early detection and notification of disease
Intensive and free-range poultry raising requires daily inspection by the owner/manager of live birds, observation of flock health and welfare and feed consumption, and recording of mortalities, which makes early detection of abnormal signs or death rates very likely. Enterprises are usually aware of the impact of endemic disease and use established procedures for disease detection and notification within the organisation or farm. Staff
training should include awareness of the signs of EADs and the requirement to notify the authorities. A veterinarian with poultry experience is usually involved early in the investigation of any unusual disease condition.

The owner and veterinarian are primarily involved in notifying unusual disease, but everyone is responsible for reporting such events. Suspicious conditions should be notified to the local government veterinarian or through the Disease Watch Hotline (1800 675 888).

Monitoring and detection procedures for each of the 11 poultry-related enterprises are given below.

3.2.1 Post-entry quarantine facility — hatchery and farm
Pre-import testing of the highly biosecure donor flocks overseas, before entry of the imported eggs into post-entry quarantine facilities, reduces the likelihood that these facilities will be involved in an outbreak. These facilities are audited and supervised by the Australian Government Department of Agriculture, Fisheries and Forestry (DAFF), and undergo targeted serological, virological and bacteriological monitoring, as well as routine investigation of elevated mortality by DAFF as part of the importation process. As a result, EADs in the flocks would be rapidly diagnosed. The isolation of these farms, the very strict biosecurity rules regarding entry, and the restrictions on contact with other poultry after people leave the site mean that disease spread is unlikely.

3.2.2 Primary breeding (great-grandparent/grandparent) farm
The isolation of primary breeding farms reduces the likelihood that they will be involved in an outbreak. These flocks undergo regular serological, virological and bacteriological monitoring as part of quality assurance programs, making disease detection much easier. Nevertheless, each enterprise must inspect its flocks regularly, examine for soft-shelled eggs or eggs with other shell abnormalities, check egg production records, and autopsy any abnormal mortality.

3.2.3 Parent breeder farm
Regular inspection of flocks and postmortem of any abnormal mortalities, which is required for endemic disease control and quality control purposes, should result in early detection of an EAD. Changes to egg internal or external quality would also result in an investigation.

3.2.4 Hatchery
A drop in egg production or hatchability as a result of an EAD may be observed at the hatchery. Hatcheries usually keep good records and may use computerised monitoring procedures. Trace-back to the flock of origin should result in inspection of the flock by a serviceperson or a veterinarian.

3.2.5 Meat bird farm
Monitoring procedures on broiler farms are the same as on breeder farms (see Section 3.2.2).

3.2.6 Poultry processing plant
Each plant keeps records of the number of birds dead on arrival, the number of reject birds that reach the plant, and the percentage and categories of downgrades. These inspections and records will help to identify EAD outbreaks, when abnormal signs, and deaths in crates and containers, can be expected.
3.2.7  **Layer (table egg) farm**
Monitoring procedures on layer farms are the same as on breeder farms (see Section 3.2.3).

3.2.8  **Egg product processing plant**
Egg processing plants should report any increase in soft-shelled eggs or eggs with other shell abnormalities, as well as changes in internal egg quality, and have adequate records to identify the source flock.

3.2.9  **Stockfeed mill**
High poultry mortality would lead to reduced feed orders, but many other causes have this effect and feedmill staff are unlikely to be alert to such an indicator. However, monitoring might be used during a known outbreak.

Feed-truck drivers, on the other hand, are the ‘intercom’ of the poultry industry and will usually be among the first to know of an abnormal event. This information may or may not be accurate.

3.2.10  **Diagnostic laboratory**
The laboratory is one of the most likely places that suspicion of an EAD will arise. It is essential that staff are familiar with EAD symptoms, reporting of EADs and the procedures to be adopted.

3.2.11  **Free-range egg layer and chicken meat farms**
Monitoring procedures on free-range farms are the same as on breeder farms (see Section 3.2.2).

3.3  **Training of staff**
All staff should be aware of the risk of EADs of poultry and of the main signs that they might encounter in the workplace. Training in hygiene disciplines is important in all poultry enterprises, and should include EAD awareness.

The importance of reporting suspicious signs is paramount. Reporting should be a simple process for the farmer or employee, who should be able to make one telephone call (to the veterinarian, the Disease Watch Hotline or the laboratory), and not have to fill in forms or report through a chain of command.

All farm staff should know the normal appearance and behaviour of poultry, and the normal production parameters of the farm, so that they can recognise any abnormality.

Hatchery staff should be trained in trace-back to investigate poor production, and in trace-forward. They should be given practical experience in tracing, as this will be useful in an EAD outbreak.

At poultry meat processing plants, staff responsible for monitoring the quality of incoming birds should be trained to recognise abnormalities. Supervisory staff should be trained to recognise conditions for which incoming birds should be rejected or poultry meat should be condemned. This skill will improve their ability to recognise EAD signs.
Staff at stockfeed mills and egg product processing plants should be trained in general EAD awareness, so that they will understand the need to report suspicious incidents.

Diagnostic laboratory staff should be trained in diagnostic signs of EADs, and notification and decontamination procedures.

### 3.4 Work procedures, staff hygiene and biosecurity

All work practices in the poultry industry should be designed with hygiene and biosecurity in mind. Appropriate standard precautions help to minimise the spread of organisms that contribute to poor shelf life of product and may cause food poisoning. Good practices will also limit the spread of EAD agents.

Staff should have special protective clothing. Staff who visit more than one enterprise should use a new clothing set for each establishment. Desirable precautions also include a visitors’ book at each establishment to allow trace-back and trace-forward in the event of an EAD outbreak. Visitors should be required to sign a statement that they have not visited other farms or been in contact with birds for 24 hours (for broiler farms) and 72 hours (for breeder farms).

Staff should be required to have no contact with poultry or pet birds in their homes. A personnel quarantine declaration should be lodged by all employees every 6 months, as stipulated in the National Farm Biosecurity Manual — Poultry Production.

Safe methods of collection and dispatch of live and dead birds, and tissue samples to the laboratory should be a part of normal procedures.

Facilities for decontamination should be provided (see the Decontamination Manual and Section 5.4 of this manual).

Additional work procedures for each of the 11 poultry-related enterprises are given below.

#### 3.4.1 Post-entry quarantine facility — hatchery and farm

Entry to post-entry quarantine facilities is restricted to essential personnel only. All staff and visitor entries and exits into the facility are logged. A negative faecal test for Salmonella may be required before entry, along with up to 7 days restriction from contact with poultry and birds before and after entry. All post-entry quarantine facilities require showering on entry and exit. No equipment or items are permitted to exit the premises (apart from laboratory samples) until the quarantine period is complete without approval from DAFF.

#### 3.4.2 Primary breeding (great-grandparent/grandparent) farm

In addition to the general principles outlined above and in Section 3.4.3, staff at primary breeding farms should expect even more rigorous requirements to apply (including showering on entry to the premises) and to be subject to personal audits of their home environment, movements and contacts.

If possible, all equipment should remain on the farm. All incoming equipment and raw materials should be fumigated or thoroughly cleaned and disinfected. Feed should be delivered from outside the perimeter of the farm. Footbaths and/or boot changes, and hand washing or sanitisation should also be undertaken at shed entry.
3.4.3 Parent breeder farm
Staff of breeder farms should change into clean protective clothing and footwear when entering the farm and have no outside contact with birds. Many breeder farms require staff to shower before entry. Footbaths and/or boot changes, and hand washing or sanitation should also be undertaken at shed entry.

3.4.4 Hatchery
Good hatchery hygiene and biosecurity are accepted for endemic disease control. Regular monitoring of batch identification systems is needed. Staff should have no outside contact with any birds, particularly commercial birds.

3.4.5 Meat bird farm
Hygiene and biosecurity procedures for staff and visitors on broiler farms are the same as on breeder farms (see Section 3.4.2).

Pick-up teams used to catch live birds at farms must be constantly encouraged to practise good hygiene. Such teams may carry pathogenic organisms, and potentially EAD agents, from farm to farm. Their equipment is usually transferred between farms in the course of the shift, without cleaning, and they might not change clothing between farms. Pick-up staff are often casual workers, and the imposition of hygiene discipline is difficult, increasing the risk of disease transmission. The danger is less for meat chicken farms on final pick-up, where a clean-up and spelling period is normal practice.

Boots of pick-up crew members must be sanitised before entry into a new shed, and hands should be sanitised before shed entry. The crew should work from youngest to oldest flocks during the day. Where it is not possible to adhere to this principle, more rigorous hygiene and cleaning measures for pick-up staff, equipment and trucks must be put in place between farms.

3.4.6 Poultry processing plant
Poultry processing staff should put on clean protective clothing at the beginning of a shift and avoid contact with the staff from the previous shift. Tools should be cleaned and plunged into hot water between uses. Regular handwashing should be required.

Crates used for live bird or egg transport should be cleaned and sanitised at least daily. Washing facilities should be provided for trucks, pallets, trolleys and forklifts. Escaped live birds should be recaptured promptly. Offal and effluent disposal should be well planned and supervised.

3.4.7 Layer (table egg) farm
Hygiene and biosecurity procedures on layer farms are the same as on breeder farms (see Section 3.4.2).

3.4.8 Egg product processing plant
Since *Salmonella* contamination of egg products is a continuing risk, staff should be aware of hygiene and decontamination procedures. Protective clothing will minimise the contamination of staff and possible spread of microorganisms.
3.4.9 Stockfeed mill

Batch identification systems should be monitored regularly. Drivers should ensure that they observe all biosecurity practices in place on farms and should be aware of truck decontamination procedures.

3.4.10 Diagnostic laboratory

The laboratory is one of the most likely places that suspicion of an EAD will arise. It is essential that staff are familiar with EAD symptoms, reporting of EADs and the procedures to be adopted.

3.4.11 Free-range egg layer and chicken meat farms

Hygiene and biosecurity procedures on free-range farms are the same as on parent breeder farms (see Section 3.4.2). In addition, staff should focus on preventing entry of wild birds, feral animals and vermin into the premises.

3.5 Movement conditions review

Managing and tracing the movements of people and vehicles between enterprises is one of the most important tasks in an EAD response.

Each enterprise manager should include a list of inwards and outwards movements, based on the information in this section, in the enterprise’s biosecurity manual. The enterprise should document methods for limiting all movements, if necessary.

Movement conditions during a poultry EAD response are explained in the relevant Disease Strategies.

3.5.1 Post-entry quarantine facility — hatchery and farm

Inwards movements

Fertile eggs from extensively tested and biosecure donor flocks overseas are imported into the post-entry quarantine hatchery facility after complying with specific import conditions, including veterinary inspections, diagnostic tests and eggshell sanitation.

Feed is usually irradiated to ensure freedom from potential pathogens.

Visitors only enter after strictly enforced stand-down times.

Outward movements

Until quarantine restrictions are removed, the only items to move out of the quarantine farms are samples for laboratory testing, or waste materials following sterilisation by autoclaving; any other movements require the approval of DAFF. After the quarantine period is successfully completed at around 9–10 weeks of age, the birds will be moved to a primary breeding farm; any remaining waste is not subject to further quarantine.
3.5.2 Primary breeding (great-grandparent/grandparent) farm

Inwards movements

Birds may be placed onto primary breeding farms from the primary breeding hatchery as day-old chicks, from the quarantine farm at 9–10 weeks, or from another primary breeding farm before point of lay.

Day-old or rearing chickens are brought to the farm in biosecure trucks.

Feed would come from a mill where the manufacture and delivery would be specified to avoid cross-contamination and Salmonella freedom. Feed is delivered in dedicated trucks.

Pick-up teams and vaccination teams may enter the breeding farm in accordance with the appropriate biosecurity requirements.

Outwards movements

Fertile eggs produced by the primary breeding flocks that are not hatched in a co-located primary breeding hatchery are shipped in dedicated biosecure trucks to other primary breeding hatcheries. Eggs may also be exported to overseas hatcheries according to a trading partner’s animal health requirements and under DAFF export health certification.

Dead and spent birds may be sent for processing, rendering or burial.

Shed litter is trucked out for use as fertiliser.

3.5.3 Parent breeder farm

Inwards movements

Day-old chicks come from the great-grandparent/grandparent hatchery in plastic or cardboard crates in thermally insulated trucks.

Reared pullets (before point of lay) may move in dedicated trucks between rearing farms — where they are raised from day-old until before point of lay — and production farms, where they produce fertile eggs. Occasionally, ‘spiking males’ (young male birds used to replace older males) may also be moved into production flocks.

Feed comes from the feedmill in trucks, which may visit several farms on each trip.

Pick-up teams and vaccination teams may enter the breeding farm in accordance with the appropriate biosecurity requirements.

Outwards movements

Plastic chick crates, if used, will be sent back to the hatchery for cleaning and reuse.

Fertile eggs are shipped in closed, insulated trucks to commercial hatcheries. The trucks usually pick up eggs from a special delivery point at the perimeter of the fertile egg farm and are not normally sanitised on each journey.

Nonhatching eggs (double yolked, small, cracked or dirty) may be sent to egg processing plants for human consumption.
Breeders are shipped to specialist processing plants at the end of their laying cycle.

Dead birds may be sent for rendering or burial.

Shed litter is trucked out for use as fertiliser.

3.5.4 Hatchery

Inwards movements
Eggs come to the hatchery from breeder farms in closed, insulated trucks.

Plastic chick crates are returned to the hatchery for decontamination and reuse after deliveries to farms.

Outwards movements
Hatching eggs may be sent to another hatchery.

Nonhatching eggs may be collected from the farms, gathered together, and sent to egg processing plants for processing for human consumption.

Day-old chicks are shipped to meat chicken, layer and started pullet farms in special trucks, which may visit more than one farm on each trip. Trucks are not usually sanitised unless they are going to breeder farms, some of which have a truck wash/sanitiser at the entry. Some of these vehicles may be leaky and a potential source of contamination.

From meat breeding primary breeding hatcheries, off-sex chicks (those not required for breeding) may be sent to meat bird farms for raising for human consumption, in addition to the breeding birds sent to the primary/parent breeding farms.

Hatcheries producing grandparent or parent breeders or commercial layers may export chicks overseas according to a trading partner’s animal health requirements and under DAFF export health certification.

Hatchery waste goes to a rendering plant or garbage tip.

3.5.5 Meat bird farm

Inwards movements
Day-old chicks in plastic chick crates or cardboard boxes come from the commercial hatchery by insulated truck, which can deliver chicks to more than one farm. Chick crates are taken into the sheds and are usually returned to the hatchery on the chick truck; cardboard boxes are not usually returned.

From meat breeding primary breeding hatcheries, offsex chicks (those not required for breeding) may be sent to meat bird farms for raising for human consumption.

Feed comes from the feedmill in trucks, which may visit several farms on each trip.

Pick-up teams and vaccination teams may enter the meat chicken farm in accordance with the appropriate biosecurity requirements.
Outwards movements
Grown chickens are shipped on trucks, in plastic crates or modules, to the processing plant. Trucks may be weighed on public weighbridges, where contact with poultry from other enterprises is possible.

Dead birds are taken to a rendering plant or a burial site.

Shed litter is trucked out for use as fertiliser.

3.5.6 Poultry processing plant

Inwards movements
Trucks loaded with crates or modules of live birds arrive at the plant. The loaded truck is weighed at a weighbridge; this may be either on the processing plant premises or a public weighbridge, where contact with birds from other organisations is possible. After unloading, trucks are reloaded with empty crates for return to the farm. Trucks and crates are washed and sanitised at least at the beginning of each day’s operation.

Pick-up teams and vaccination teams may enter the poultry processing plant in accordance with the appropriate biosecurity requirements.

Outwards movements
Fresh or frozen product is moved by refrigerated trucks for delivery to customers.

Offal and waste go by various vehicles to pet food manufacturers, rendering plants or garbage tips. Some of these vehicles could be leaky and a potential source of contamination.

Live-bird delivery trucks return to farms with crates.

3.5.7 Layer (table egg) farm

Inwards movements
Day-old chicks in plastic chick crates come from the commercial hatchery by thermally insulated truck, which can deliver chicks to more than one farm. Chick crates are taken into the sheds and are usually returned to the hatchery on the chick truck.

Started pullets come from the started pullet farm (which may be in another state) in plastic crates.

Feed comes from the feedmill in trucks, which may visit several farms on each trip.

Pick-up teams and vaccination teams may enter the poultry processing plant in accordance with the appropriate biosecurity requirements.

Outwards movements
Eggs are trucked to market. The egg pick-up point is usually remote from live birds, and contamination of vehicles is likely to be minor.

Egg pulp, second-quality and surplus eggs go to an egg processing plant.
Dead birds are taken to a rendering plant, or a composting or burial site.

Shed litter is trucked out for use as fertiliser.

3.5.8 Egg product processing plant

Inwards movements
Egg pulp, second-quality and surplus eggs come direct from a grading floor, which may be on a farm or elsewhere.

Second-quality eggs may also come from parent and primary breeder farms, in addition to commercial egg farms.

Outwards movements
Dried or frozen product goes directly to end users.

3.5.9 Stockfeed mill

Inwards movements
Poultry and feather meal, grain, protein meals such as soybean meal, and other feed ingredients are brought onto the premises in bulk or in bags.

Outwards movements
Mixed feed leaves the mill in bulk trucks, which may go to one or more farms, for delivery into silos.

Smaller consignments may be in multiwalled paper bags, or new or used hessian or plastic feed bags.

3.5.10 Diagnostic laboratory

Inwards movements
Sick and dead birds or tissue/blood samples are brought to the laboratory by farmers or service personnel.

Holding arrangements for such specimens are often unsatisfactory, increasing the risk of disease spread. Specimens of noncommercial species of bird are a likely source of EAD agents and should not be accepted at the diagnostic laboratory.

Outwards movements
Postmortem remains are usually burned, buried or composted off-site by a contractor. Cultures are usually autoclaved.

3.5.11 Free-range egg layer and chicken meat farms

Movements to and from free-range farms are the same as for layer and chicken meat farms.
3.6 **Internal quarantine (partitioning)**

Internal enterprise divisions may allow part of a property to be excluded from the area declared an infected premises. Significant factors will be the complete separation of staff, equipment and vehicles; drainage; aerosols from ventilation systems; and the space between buildings. It is likely that this will only be possible in the case of a ‘complex’ (in which there are groups of sheds comprising independent ‘farms’, each with their own staff, etc).

Relevant aspects of each of the 11 poultry-related enterprises are given below.

**3.6.1 Post-entry quarantine facility — hatchery and farm**

These facilities are designed either to provide total internal separation between consignments, or to house only a single consignment.

**3.6.2 Primary breeding (great-grandparent/grandparent) farm**

Primary breeder farms that have flocks of different ages use isolation and strict hygiene between sections. Each shed or group of sheds will house a single-age, all-in-all-out flock. A hatchery on this type of farm may be internally isolated.

**3.6.3 Parent breeder farm**

On breeder farms, each shed or group of sheds houses a single-age, all-in-all-out flock, with each group or section usually separated from others by 200–400 m. The distance between sheds in a single-age section is usually about 20–25 m. Sick and injured birds are euthanased.

**3.6.4 Hatchery**

Most hatcheries have only limited space for cool-temperature storage of eggs. Although the source of the eggs is identified, physical separation by source may not be maintained in the setters or hatchers in all hatcheries.

**3.6.5 Meat bird farm**

The whole farm is filled in one period, which may be some days to a few weeks. The farm is treated as a single-age, all-in-all-out flock. The distance between sheds within a single-age farm is usually about 20–25 m. Sick and injured birds are euthanased.

**3.6.6 Poultry processing plant**

There is no provision for holding suspect birds at a processing plant. They can be slaughtered and disposed of at a rendering plant if the relevant Disease Strategy permits it. Refer to the Decontamination Manual for further information about vehicle and cage washing facilities.

**3.6.7 Layer (table egg) farm**

Many layer farms are multi-age operations with little isolation between age groups, and in some cases sheds contain layers of different ages. If isolation and hygiene practices between sections are applied, each shed or group of sheds may be a single-age, all-in-all-out operation. Sick and injured birds are euthanased.
3.6.8 Egg product processing plant
Shell eggs may be able to be isolated and stored for up to 4 months at 4 °C for use in egg pulp or in cooking. Once eggs are pulped, they cannot be traced back to a single flock of origin.

3.6.9 Stockfeed mill
Mills have storage for major ingredients because most ingredients are produced and available seasonally. There is usually little storage available for finished feeds, as mixing is normally done immediately before delivery. Refer to the Decontamination Manual for further information about vehicle washing facilities.

3.6.10 Diagnostic laboratory
Live or dead specimens of birds may be held in cages, crates or boxes in an area outside the postmortem room. This must be under cover to prevent climatic stress on live birds, and must be an enclosed area to prevent their escape and access of wild animals or birds. Dead birds should be held at 4 °C in a refrigerator to prevent decomposition. Tissue and blood samples are usually processed shortly after receipt.

3.6.11 Free-range egg layer and chicken meat farms
Free-range farms may cover a large area, but separation of their activities is usually impractical. Rotational grazing may be practised, causing the land to be contaminated by several flocks.

3.7 Disposal methods

3.7.1 Post-entry quarantine facility — hatchery and farm
Until quarantine restrictions are removed, the only items to move out of the quarantine farms are samples for laboratory testing, or waste materials following sterilisation by autoclaving; any other movements require the approval of DAFF. After successful completion of the quarantine period, any remaining waste is not subject to further quarantine.

3.7.2 Primary breeding (great-grandparent/grandparent) farm
Dead birds are incinerated, buried, composted or collected by a commercial dead-bird disposal operator. Litter, including manure, is sold as fertiliser.

3.7.3 Parent breeder farm
Dead birds are incinerated, buried, composted or collected by a commercial dead-bird disposal operator. Litter, including manure, is sold as fertiliser.

3.7.4 Hatchery
Hatch waste goes to rendering plants or commercial dumps. Effluent is treated and goes to the sewer or settlement ponds.
3.7.5 **Meat bird farm**
Dead birds are incinerated, buried, composted or collected by a commercial dead-bird disposal operator. Litter, including manure, is sold as fertiliser.

3.7.6 **Poultry processing plant**
Offal goes to pet food manufacturers or to rendering plants. Effluent is treated on-site and used as fertiliser on pastures or sent to the sewer.

3.7.7 **Layer (table egg) farm**
Dead birds are incinerated, buried, composted or collected by a commercial dead-bird disposal operator. Manure for use as fertiliser is sold or used within a vertically integrated operation (either on-site or at another location).

3.7.8 **Egg product processing plant**
Waste is treated and goes to the sewer, treatment plants and/or settlement ponds.

3.7.9 **Stockfeed mill**
Waste is a minimal problem. Feed dust is collected in coarse cyclone filter bags and reused as a minor ingredient in feed.

3.7.10 **Diagnostic laboratory**
Incineration and medical waste collection are the most common disposal methods, but burial or composting are sometimes used for carcasses. Cultures are autoclaved.

3.7.11 **Free-range egg layer and chicken meat farms**
Dead birds are incinerated, buried, composted or collected by a commercial dead-bird disposal operator. Manure is usually spread on paddocks to help regenerate the pastures.

3.8 **Records**
Records are kept for commercial reasons (invoicing, production planning, performance evaluation, quality control, etc) and in some cases for technical reasons, such as tracing problems to their source.

Depending on the type of enterprise, records may include:

- source, date and numbers or quantities of birds or product
- mortality
- hatchability
- egg production graphs or records
- percentage of second-quality eggs produced
- feed delivery details
- vaccination and medication records, with vaccine batch numbers
- feed consumption
• movements to and from the premises, and visitor details
• weather and climatic records.

Relevant aspects of each of the 11 poultry-related enterprises are given below.

3.8.1 Post-entry quarantine facility — hatchery and farm

Detailed records of the imported flocks will be kept by the importer and provided to DAFF on request. Other records will also be kept, including date of hatching, daily mortality, bodyweight, laboratory sampling and results, and other significant events.

3.8.2 Primary breeding (great-grandparent/grandparent) farm

Records are kept of the breeder flock of origin, date of hatching, daily mortality, bodyweight, egg production, bird movements and any significant events (such as vaccination, medication, weather changes).

Other records may also be kept, including water intake, mating ratios, egg weight and mass, serological titres, microbiological test results, feed intake and feed eat-up time.

3.8.3 Parent breeder farm

Records are kept of the breeder flock of origin, date of hatching, daily mortality and culls, bodyweight, egg production, bird movements and any significant events (such as vaccination, medication, weather changes).

Other records may also be kept, including water intake, mating ratios, egg weight and mass, serological titres, microbiological test results, feed intake and feed eat-up time.

3.8.4 Hatchery

Each batch of eggs arriving at the hatchery is usually identified to its source flock of breeders and date laid, for monitoring of breeder flock performance. Hatchery records will include number of eggs set, egg age, hatchability and fertility, and embryonic mortality where egg breakouts are undertaken. In many organisations, chick performance continues to be monitored on the farm. The number of hatching eggs and hatched chicks per breeding hen is an important measure of overall breeder flock performance.

3.8.5 Meat bird farm

Records are kept of the breeder flock of origin, date of hatching, daily mortality and culls, bodyweight and bird movements, at a minimum.

3.8.6 Poultry processing plant

Accurate records are kept up to the arrival of birds at the plant because producers may be paid on the basis of the liveweight of birds, and liveweight is used in efficiency schemes. The processor is usually interested in the further performance of the flock as it goes through the plant, but identity is usually lost once the product is further processed.
3.8.7 Layer (table egg) farm
Records are kept of the breeder flock of origin, date of hatching, daily mortality, bodyweight, egg production, bird movements and any significant events (such as vaccination, medication, weather changes, egg sales).

3.8.8 Egg product processing plant
Commercial records show the origin of batches of eggs, but trace-back to individual flock of origin is not possible after processing.

3.8.9 Stockfeed mill
Feed samples and records of raw ingredients delivered to the mill, as well as finished feed for each batch made, are kept for invoicing and in case the feed is implicated in a disease or production incident.

3.8.10 Diagnostic laboratory
Specimens arriving at the laboratory are usually accompanied by a written case history report that has been completed by the farmer, serviceperson or veterinarian. All laboratories have a case accession number that allows any further testing on the specimens to be traced and results to be reported.

3.8.11 Free-range egg layer and chicken meat farms
Records are kept as for layer (table egg) farms and chicken meat farms. Records of flock movements may also be useful.

3.9 Water supply arrangements
All water used for drinking and fogging inside sheds should be microbiologically safe for poultry. Some poultry establishments are connected to town water supplies. Some farms use bore water or surface water (dams, rivers or irrigation channels) and may have a problem with contamination with coliforms, with endemic disease agents and potentially with EAD agents, because of exposure to waterfowl that may be carriers. Surface water is commonly treated by chlorination or chlorine dioxide.

During an EAD response, additional water may be needed for decontamination of vehicles, equipment and sheds. Some farms use dam water for wash down. This water should be effectively sanitised before use.

3.10 Control of wildlife and feral animals
Buildings in poultry enterprises are usually bird and rodent-proof, to the extent that is realistically possible, but some layer and meat chicken farms are not adequately protected. Free-range poultry farms often offer little protection from wildlife contact during the period that the poultry are on open range.

Water reservoirs may be poorly protected from waterfowl. Environmental conditions should be evaluated to determine whether they are attracting excessive numbers of wild birds or other animals to the property, particularly in free-range operations.
4 Response plans in a declared area

4.1 Introduction

This section addresses the situation in which a poultry-related enterprise, although not having any clinical or suspected cases of an emergency animal disease (EAD) itself, is within either a restricted area (RA) or a control area (CA) because of an outbreak on another property.

4.1.1 Declared areas

A declared area is an area that is subject to a legal declaration. It includes one or more RAs and a CA.

An RA is a relatively small area around an infected premises (IP), and is subject to intense surveillance and movement controls. It may include some dangerous contact premises (DCPs), some suspect premises (SPs) and some trace premises (TPs), as well as enterprises that are not infected (at-risk premises). Movement out of the RA will generally be prohibited, while movement into it will only be by permit. Multiple RAs may exist within one CA. Guidelines for establishing RAs are provided in each Disease Strategy and in the World Organisation for Animal Health Terrestrial Animal Health Code.

A CA is a buffer between the RA and the outside area. Restrictions within the CA will reduce the chance of the disease spreading beyond these boundaries. The size and shape of the CA may be reduced as the extent of the outbreak becomes clearer. In principle, birds and specified product will be able to be moved out of the CA into the outside disease-free area by permit only.

4.1.2 Local control centre

In the event of an emergency animal disease (EAD) outbreak in the area of a poultry-related enterprise, enterprise managers should be in contact with the local control centre (LCC) set up to coordinate the EAD response. All staff should be fully aware of LCC requirements and of arrangements to avoid the risk of spread of disease.

4.2 Continued operation of a disease-free enterprise in a declared area

4.2.1 General principles

AUSVETPLAN Disease Strategies cover this topic in detail. Approval to continue operating will depend on the epidemiology of the outbreak, the possibility of infection and the risk to the rest of the industry.

Movement restrictions on live birds (taking into account the welfare of the birds) and products will be imposed until the disease picture becomes clearer. Restrictions may be modified once properties are cleared following inspection and, possibly, testing. Additional testing and/or inspections may be necessary to confirm continuing freedom from the disease before a particular movement is permitted.
In most cases, poultry enterprises not directly affected should be able to continue to operate, subject to some additional hygiene and security measures. Product and byproduct may have to be held until cleared, treated or decontaminated. People, vehicles and equipment should be decontaminated before entering and leaving poultry premises.

Socioeconomic impacts on the industry and individuals, and the consequent loss to associated parts of the industry and employees must be balanced against the direct costs and the benefits to the industry of eradicating the disease. To decrease the impact, a decision to use vaccination to aid eradication may be made, if a suitable, permitted vaccine is available.

Advance arrangements for funding an approved eradication plan have been agreed by the government and livestock industries in the EAD Response Agreement, but such funds are not limitless. Through the Consultative Committee on Emergency Animal Diseases (CCEAD) and the National Management Group (NMG), the Australian Government, the state and territory governments, and industry will continuously evaluate the cost-effectiveness of the measures being taken. Each step in expenditure requires approval by the CCEAD and the NMG.

If an enterprise is closed because of an EAD outbreak, some of the local socioeconomic effects could be reduced by employing staff in EAD control activities.

4.2.2 Considerations for specific establishments

The relevant Disease Strategy gives details of quarantine and movement controls during the EAD response.

Post-entry quarantine facility (hatchery and farm) and primary breeding (great-grandparent/grandparent) farm

Post-entry quarantine facilities and primary breeding farms are usually well isolated. It may be possible to allow the enterprise to continue to operate, provided its current disease status (which may be confirmed by disease testing), isolation and biosecurity can be proven. Enterprises of this type could apply to move animals or products under permit conditions, as set out in the relevant Disease Strategy. Continued supply from these enterprises may be assisted by vaccination, if a suitable, permitted vaccine is available.

Parent breeder farm

Fertile eggs from an unaffected parent breeder farm may be permitted to go to an approved hatchery in the declared area.

Hatchery

If possible, hatcheries should be excluded from the RA.

A hatchery in a CA may continue to receive fertile eggs from properties that are not IPs, DCPs or SPs if:

- it has not been contaminated and receives fertile eggs only from disease-free properties or
- having been contaminated, it is decontaminated under supervision and subsequently receives fertile eggs only from disease-free properties.
Such a hatchery may receive fertile eggs from outside the CA under permit.

Fertile eggs may be held in isolation in a coolroom (12–18 °C) for up to 14 days before setting, and for the first 18 days of incubation while the status of the source flock is clarified. Genetic salvage may be permitted under strict conditions.

**Meat bird farm**

Grown meat chickens from disease-free farms may be permitted to go to an approved processing plant. Meat chicken farms will be expected to implement increased biosecurity measures, as detailed in the *National Farm Biosecurity Manual for Chicken Growers* (ACMF 2010; under Level 2).

**Poultry processing plant**

If possible, processing plants should be excluded from the RA.

A plant in a CA may continue to receive birds from properties if:

- it produces cooked product only
- or
- it has not been contaminated and receives birds only from disease-free properties
- or
- having been contaminated, it is decontaminated under supervision and subsequently receives birds only from disease-free properties.

Such a plant may receive birds from disease-free farms in the CA or from the outside area (OA) if the transport vehicles used are disinfected before leaving the CA.

Stored, uncooked product from an SP may be allowed to be held under secure storage until the disease status is established.

**Layer (table egg) farm**

Eggs from unaffected farms in the RA or CA may be sold, but usually only under permit and following sanitation.

**Egg product processing plant**

An egg product processing plant in a declared area may continue to receive eggs from properties that are not IPs, DCPs or SPs if:

- it produces cooked or pasteurised product only
- or
- it has not been contaminated and receives eggs only from disease-free properties
- or
- having been contaminated, it is decontaminated under supervision and receives eggs only from disease-free properties.

Such a plant may receive eggs from the OA if the transport vehicles used are disinfected before leaving the CA. Stored, uncooked product from a DCP, SP or TP may be allowed to be held under secure storage until the disease status is established.
Stockfeed mill
If possible, stockfeed mills should be excluded from the RA. However, if there are sufficient birds within the declared area to consume a mill’s output, it may be preferable to include the mill. If vehicles can be decontaminated as they leave the CA, it may be possible to deliver bulk feed into or out of the CA. The trucks and their drivers pose a greater risk of disease spread than the mill or feed itself.

Diagnostic laboratory
Diagnostic laboratories should not be excluded from the declared area, because they could spread disease. A laboratory in the declared area will be useful for examining specimens from SPs. In such a case, the staff and the laboratory will be subject to rigorous decontamination procedures.

If the laboratory is not used to examine specimens from SPs, it may be allowed to continue to receive specimens from farms outside the declared area. In this case, vehicles should transfer specimens at the perimeter of the area to minimise the need for vehicle decontamination.

Free-range egg layer and chicken meat farms
Restrictions for free-range farms are the same as for layer farms. Eggs from unaffected farms may be sold, but in most cases only under permit.

4.3 Minimising risks during continued operation

4.3.1 General principles
Enterprise operators and staff can take steps to minimise the risk of introducing EAD agents during an outbreak, including control of the entry of birds, product, visitors, equipment and other material. Normal hygiene and other biosecurity measures should be improved, and thorough records of poultry and product movement should be maintained. Enterprises that operate under a code of good manufacturing practice or a similar quality assurance program will have an advantage in minimising disease risks.

The original source of the EAD agent and its spread will be unknown at the beginning of, and possibly at all times during, an outbreak. For this reason, all enterprises in a declared area should take extra precautions. The objectives are to prevent the spread of the organism from infected locations to the enterprise and from the enterprise to other locations.

The enterprise should establish contact with the industry liaison officer in the LCC to ensure that all regulations are being satisfied and that the enterprise is aware of developments.

Movements of poultry and people
Movements of live poultry and personnel must be restricted. Clean overalls and footwear should be provided for essential visitors at a fixed entry point on the perimeter. Disinfectant footbaths should be properly managed and used. Vehicles and equipment should be decontaminated as a routine on entry and leaving the premises. This is especially important for pick-up vehicles going back to farms where they will have contact with live birds.
Vaccination
Vaccination against Newcastle disease (ND), avian influenza (AI) or infectious bursal disease (IBD) may be adopted as part of the control strategy if a suitable, permitted vaccine is available. Vaccination against ND (compulsory) and IBD is currently permissible outside of an EAD response, so flocks may have been previously vaccinated with the same strain as the outbreak strain.

If vaccination is adopted as part of the eradication strategy, it will be under the strict control of regulatory and animal health authorities in accordance with the relevant Disease Strategy.

Occupational health and safety
Staff in contact with infected flocks should observe occupational health and safety precautions as specified in the Disease Strategy, especially in the case of an AI outbreak. Staff should be monitored for conjunctivitis (which could also be caused by ND virus infection) or respiratory symptoms (which could be due to AI virus infection), and appropriate medical attention should be sought. The control authorities should be notified of any such cases. In a zoonotic outbreak, the state chief veterinary officer should contact their counterparts in the public health authority.

4.3.2 Minimising risks to specific establishments
The following precautions are appropriate for each of the 10 types of poultry enterprise. They are additional to the requirements that result from the establishment being in a declared area.

Post-entry quarantine facility (hatchery and farm) and primary breeding (great-grandparent/grandparent) farm
Precautions on post-entry quarantine facilities and primary breeding farms should always be maximised because of the very high value of the stock. An audit of all movements on and off the premises should be undertaken to list all possible points of contact with outside sources of infection. Particular attention should be paid to the possibility of aerosol transmission from adjacent farms and the presence of free-flying birds. Additional serological and virological monitoring could be undertaken to confirm freedom from the EAD.

Parent breeder farm
Entry of non-essential people or vehicles should be prohibited. Staff with any access to birds off the premises should take leave or be given duties that keep them out of contact with poultry.

If allowed by the animal health authorities, placement of new chicks may continue. Manure can be composted in the shed. Birds nearing the end of their productive lives may be held on the farm for a longer period if this is useful. Meat breeder chickens on dedicated rearing farms can be held for only a short time, especially in hot weather, as overstocking and consequent mortalities could result. Permission to transfer birds to production sites or makeshift shelters may be sought.

Live birds of any species are a risk, so bird-proofing of sheds is imperative.
Windborne spread of EAD viruses can occur over about 15 km, and spread on dust by aerosol is also possible. The geography of the area is therefore important. If possible, ways should be found to interrupt the wind flow from the poultry farm. Closing the curtains on the side of the shed nearest to the possible source of virus may be all that can be done.

The area around sheds should be cleared of any materials (including long grass) that can harbour vermin or encourage wild birds to use the area.

**Hatchery**

Staff with access to any birds off the premises should take leave or be given duties that involve no contact with live birds.

Because eggs from breeder farms could be coming from birds incubating disease, it is prudent to delay setting to allow any incubating virus to develop and be detected on the farm. Eggs from at-risk premises and premises of relevance should be clearly identified and isolated before setting.

With AI, even eggs from SPs could be set (provided effective external egg sanitation is completed, and a dedicated machine is used). The eggs could then be destroyed with little risk if the SP becomes a DCP or an IP.

**Meat bird farm**

Risk minimisation on meat chicken farms is the same as for breeder farms.

Meat chicken farms will be expected to implement increased biosecurity measures as detailed in the *National Farm Biosecurity Manual for Chicken Growers* (under Level 2).

**Poultry processing plant**

An operating enterprise will need to allow the entry of some people, vehicles and equipment, but should exclude any that may have been exposed to infected birds, including commercial poultry, backyard poultry and pet birds. Live poultry are the main danger, but most bird species are susceptible.

Movements of vehicles, people and equipment during an EAD outbreak will be restricted, because of the potential for mechanical spread of EAD agents.

Staff with access to any birds off the premises should take leave or be given duties that do not bring them into contact with live birds or with product they could contaminate.

Staff movements between farms and other enterprises should be stopped.

Refer to the **Decontamination Manual** for information regarding decontamination of cages and vehicles.

**Layer (table egg) farm**

Risk minimisation on layer farms is similar to that for breeder farms.
Egg product processing plant
Processing eggs in batches identified by farm of origin and holding processed product for at least 7 days may enable a contaminated batch to be withdrawn if it is from a farm in the incubation stage of the disease.

An operating enterprise will need to allow the entry of some people, vehicles and equipment, but should exclude any that may have been exposed to infected birds, including commercial poultry, backyard poultry and pet birds.

Movements of vehicles, people and equipment during an EAD outbreak will be restricted, because of the potential for mechanical spread of EAD agents.

Stockfeed mill
Control of staff movements and decontamination of vehicles should be tightened.

Diagnostic laboratory
Staff movement control should be instituted. Decontamination of people, equipment and vehicles will be essential and should be rigorous. Disposal of all postmortem material should be by incineration, burial or medical waste disposal.

Free-range egg layer and chicken meat farms
Live birds of any species are a risk, and their access to poultry on free-range farms should be minimised. In addition, free-range poultry may be more likely to become infected from windborne virus. Where possible, free-range poultry should be moved into bird-proof sheds.

The area around sheds and free-range areas should be cleared of any materials (including long grass) that can harbour vermin.

On free-range operations, consideration may be given to keeping birds inside their sheds. If birds continue to be allowed to range, special attention should be paid to minimising the opportunity or incentive for rodents and wild birds to use the range or access sheds, such as by mowing the range or ensuring that water does not accumulate on the range.
5 Emergency animal disease contingency planning

5.1 Introduction

This section covers poultry-related enterprises declared by the chief veterinary officer of the state or territory under local legislation in the event of an outbreak of an emergency animal disease (EAD) to be one of the following:

- **Infected premises (IPs)** are defined areas (which may be all or part of a property) in which an EAD meeting the case definition exists or is believed to exist, or in which the causative agent of the disease exists or is believed to exist.

- **Dangerous contact premises (DCPs)** are premises that may or may not contain a susceptible animal(s), including those not showing clinical signs, but, following a risk assessment, are considered highly likely to contain an infected animal(s) or contaminated animal products, wastes or things, which present an unacceptable risk to the response if not addressed.

- **Suspect premises (SP)** is a temporary classification of a premises that contains a susceptible animal(s) not known to have been exposed to the disease agent but showing clinical signs that require investigation(s).

- **Trace premises (TP)** is a temporary classification of a premises that contains susceptible animal(s) that tracing indicates may have been exposed to an infected animal(s), or contaminated animal products, wastes or things, and that requires investigation.

On an SP, quarantine and movement controls will apply, but slaughter and destruction will be postponed until the premises is reclassified as an IP or DCP. If the SP is reclassified as disease free, the principles for continued operation described in Section 4 will apply. The specific control measures for avian influenza (AI), Newcastle disease (ND) and very virulent infectious bursal disease (IBD) are described in detail in the relevant Disease Strategy.

5.2 Continued operation of declared infected enterprises

This section applies to the enterprise only while it is an IP, DCP, SP or TP. Section 4 applies to premises that have not been declared or have been cleared of infection.

On an IP, live birds are destroyed as part of the ‘stamping out’ strategy. Carcasses, products, byproducts, offal and other material that is known or suspected to be infected or contaminated must be destroyed or effectively decontaminated.

In some cases, the cost of destroying live birds and products can be limited by partitioning within enterprises, provided that disease control is not compromised. Many poultry enterprises already use isolation between sections and clear operational divisions (separate

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13 Depending on exposure, some birds may also be destroyed on DCPs.
services, staff and equipment) for endemic disease control, or for technical or commercial reasons. However, partitioning is not always possible. For example, some viruses can be spread by wind and so large distances would be needed between sections of the enterprise. See Section 3.6 for further details of partitioning.

Special arrangements to recover fertile eggs from infected primary breeding flocks were developed during the ND outbreak in 1998–2002 in New South Wales.

Although flocks must be destroyed in a response to an EAD, the destruction could potentially be delayed for a few weeks (possibly with preventive vaccination, if a suitable, permitted vaccine is available) until adequate numbers of fertile eggs are collected and set in a dedicated biosecure hatchery. Chicks hatched from such eggs would need to be grown on an isolated, biosecure site and proven to be free from the disease.

If an EAD were to occur in a flock of meat chickens approaching slaughter age, it would not be possible to hold them on the farm for long, as the stocking density would soon become excessive and result in deaths from overcrowding. Refer to the Livestock Management and Welfare Manual.

5.3 Elimination of the disease

5.3.1 Stamping out and destruction of animals

Most avian species are susceptible to ND, AI and IBD infection. Outbreaks will be managed in accordance with the relevant Disease Strategy.

Although other avian species may not exhibit clinical disease if exposed to IBD virus, they may become infected and become potential sources of infection to poultry. The only possible exception to destroying in-contact or infected avian species is for pet birds that are kept securely inside a house or shed, unless they can be tested and the demarcation between secure and nonsecure holding is irrelevant.

5.3.2 Disposal of carcasses and materials

All carcasses and any equipment that could have become contaminated and cannot be decontaminated effectively will be destroyed by burning or burying. Composting, using approved standard operating procedures, may be an acceptable decontamination procedure for dead birds. Refer to the Disposal Manual for more information.

5.3.3 Salvage of poultry or product

Under some circumstances, salvage of birds and product may be possible. Occupational health and safety risks preclude salvaging birds by processing during an outbreak of highly pathogenic AI.

Feed that has been stored in a secure silo may have avoided contamination. However, virus survival in faeces and farm dust can be protracted, particularly in the case of very virulent IBD. The use of stored feed, either when the farm is restocked or for other livestock (preferably of a nonsusceptible species), could be considered case by case.
5.3.4 Prevention of spread

Before birds are destroyed, sheds should be closed as much as the weather permits to reduce the chance of virus being spread on the wind. Carcasses, contaminated equipment and manure that cannot be disposed of promptly should be held in a shed or under cover, or in some other way that prevents virus from being spread by the wind and vermin.

5.4 Decontamination

The Decontamination Manual should be consulted for details of chemical agents and methods suitable for various purposes. Both AI and ND viruses contain lipids and are therefore susceptible to detergents. In both cases, transmission is by infected secretions from the respiratory and intestinal tract, which results in heavy contamination of all facilities, manure and litter.

Following decontamination, a farm must be left depopulated of birds for 30 days. Non-farm poultry enterprises with impervious surfaces that are more easily decontaminated should be able to return to full operation immediately after decontamination if the epidemiology of the disease situation permits.

IBD virus is very stable and highly resistant to heat and chemicals. It can persist in the shed environment, even after cleaning and disinfection, for at least 4 months. The virus is resistant to pH conditions of 2-11, but is inactivated at pH 12. It is resistant to ether and chloroform, but is inactivated by a 2% chloramine solution, formalin at certain temperatures, glutaraldehyde and alkyl dimethylbenzylammonium chloride. Particular attention will need to be paid to the decontamination of litter. Since IBD virus can survive for up to 52 days in faecal material, the surface of the litter must be thoroughly disinfected. Methods such as prolonged composting to inactivate the virus may then be used.

Table 5.1 summarises methods of destruction, disposal and decontamination for poultry enterprises.
Table 5.1  Destruction, disposal and decontamination for poultry enterprises

<table>
<thead>
<tr>
<th>Item</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live birds</td>
<td>Destruction</td>
</tr>
<tr>
<td>Carcasses</td>
<td>Burn, bury or compost</td>
</tr>
<tr>
<td>Product or byproduct</td>
<td>Cook, can, render, burn or bury</td>
</tr>
<tr>
<td>Animal housing and equipment</td>
<td>Detergents, alkalis, a Virkon, hypochlorite, steam, iodine complexes</td>
</tr>
<tr>
<td>Humans</td>
<td>Warm soapy water</td>
</tr>
<tr>
<td>Electrical equipment</td>
<td>Formaldehyde vapour</td>
</tr>
<tr>
<td>Water (tanks or dams)</td>
<td>Drain to pasture where possible</td>
</tr>
<tr>
<td>Feed</td>
<td>Quarantine in silo or bury</td>
</tr>
<tr>
<td>Effluent</td>
<td>Bury, burn or treat with alkalis or acids (citric or hydrochloric)</td>
</tr>
<tr>
<td>Manure</td>
<td>Bury, burn or treat with alkalis or acids (citric or hydrochloric)</td>
</tr>
<tr>
<td>Human housing</td>
<td>Detergents, Virkon, hypochlorite</td>
</tr>
<tr>
<td>Machinery and vehicles</td>
<td>Detergents, alkalis</td>
</tr>
<tr>
<td>Clothing</td>
<td>Detergents, alkalis, a Virkon, hypochlorite</td>
</tr>
<tr>
<td>Aircraft</td>
<td>Detergents, Virkon</td>
</tr>
</tbody>
</table>

a  Alkalis corrode aluminium and its alloys.

b  Formaldehyde vapour is dangerous and should be used in a confined space only under experienced supervision.

5.5  Tracing requirements

The movement of live birds, eggs, products, feed, litter and manure, wastes, equipment and people over the previous 21 days will need to be traced to identify possible sources of infection and contamination. Veterinary investigation officers will use records of each enterprise and people’s memories of events, and enter details into BioSIRT (Biosecurity Surveillance, Incident, Response and Tracing), a software application that enables management of information and resources for managing animal or plant diseases or pests, and emergency responses to incursions.

5.6  Proof of freedom

Proof of disease freedom of a farm or an area requires intensive efforts to establish that the disease and its causative agent have been eradicated. This can involve restocking under supervision and surveillance of all flocks in the declared area.

For each disease, the requirements before restocking are set out in the relevant Disease Strategy. Once satisfactory cleaning and disinfection of the premises are complete, there may be a period of waiting before restocking is allowed. There may also be specific requirements governing the selection and placement of sentinel birds.

Following restocking, a program of surveillance is usually required. The nature and period of this surveillance will depend on the disease and its causative agent (see the relevant Disease Strategy).
5.7 Media and public relations

Maintaining an appropriate channel of communication with the media is an important function of the local control centre (LCC). Contact between industry liaison officers and peak industry bodies should occur to ensure that statements issued are consistent with those from the LCC. It becomes very difficult if other organisations issue information that conflicts with the advice given by the LCC. Although each poultry enterprise will need to advise its clients of the situation, it should restrict any media comment to matters that directly affect the enterprise.

General inquiries 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 LCC. For further information, see the Public Relations Manual.
Appendix 1  Summary role statements for enterprise manager

On a disease-free enterprise in a declared area
State and territory, and regional disease control authorities will be responsible for the detection, control and monitoring of the disease outbreak. The enterprise manager will be responsible for protecting the enterprise and for the following procedures:

- Ensure telephone (including mobile), fax and email connections.
- Obtain or prepare, and maintain a map of the declared area.
- Download a copy of all relevant AUSVETPLAN documents from the Animal Health Australia website.
- Brief staff on the situation and their responsibilities for avoiding contamination.
- Liaise closely with the local control centre (LCC) through the industry liaison officer and institute recommended control measures.
- Liaise closely with the industry organisation.
- Record and review all inwards and outwards movements (of birds, product, byproduct, manure, people, equipment and vehicles) over the previous 21 days.
- Institute restricted movement controls for all inwards and outwards movements for the duration of the emergency. In the case of contract meat chicken growers, invoke Level 2 biosecurity measures (as per the National Biosecurity Manual – Poultry Production; DAFF 2009a).
- Be aware of LCC/industry media advice to ensure that no conflicting information is provided to clients.
- Provide identification and segregation of all batches of product entering the premises.
- Train staff in any new procedures required.
- Review Section 4 of this manual and make appropriate changes to operations.

On an infected premises, dangerous contact premises, suspect premises or trace premises
State and territory, and regional disease control authorities will be in charge of the stamping-out and decontamination program, but the enterprise manager needs to be involved and will be responsible for the following procedures:

- Ensure communication connections (landline phone, mobile phone, email and fax).
- Obtain or prepare, and maintain a map of the declared area.
- Download a copy of all relevant AUSVETPLAN documents from the Animal Health Australia website.
- Brief staff on the situation and their responsibilities for avoiding contamination.
- Liaise closely with the officer in charge (the site supervisor) of the infected premises operations team.
- Liaise closely with the industry organisation.
• Be aware of and remain up to date on LCC/industry media advice to ensure that no conflicting information is provided to clients.
• Allocate staff responsibilities appropriate to the situation.
• Make surplus staff available for employment by the LCC.
• Review Section 5 of this manual and make appropriate changes to operations.
Appendix 2 Valuation and compensation

Policy of the EAD Response Agreement

The Government and Livestock Industry Cost Sharing Deed in Respect of Emergency Animal Disease Responses (2001)\(^{14}\) (EADRA) establishes a mechanism to facilitate rapid responses to certain emergency animal diseases (EADs), and their control and eradication or containment. The agreement provides a cost-sharing framework and stipulates the following:

An EAD Response Plan developed by the affected jurisdiction must be consistent with relevant AUSVETPLAN Management Manuals and any applicable AUSVETPLAN disease strategy. An EADRP should also be guided by other AUSVETPLAN manuals.

Cost sharing will apply in respect of compensation determined in accordance with the following principles:

- Consistent with the relevant legislation applying in the jurisdiction in question, compensation is to be paid to the owner of:
  - any livestock or property which is destroyed for the purpose of eradication or prevention of the spread of an emergency animal disease;
  - any livestock which an inspector accredited under the applicable legislation in that jurisdiction, who is a veterinary surgeon or who is approved by a CVO, is satisfied has died of the EAD and who has certified to that effect, and who (after due enquiry) is satisfied that there has been no unreasonable delay in reporting the death of the livestock and where the CVO certifies that the livestock would have been compulsorily slaughtered had they not died.

- In the case of livestock, a second payment may become due on the date the property where the livestock were located becomes eligible to be restocked provided the total value of livestock is greater on that date. The compensation payable at this second payment is the difference between the total value of livestock on that date and the amount paid for livestock in (a) and (b) above.

- In determining the amount of compensation to be paid, no allowance shall be made for loss of profit, loss occasioned by breach of contract, loss of production or any other consequential loss whatsoever.

- Participants in industries the representative bodies for which are not parties to the EADRA, and the gross value of production (GVP) of which is greater than $20 million, will not be eligible for compensation; industries the GVP of which is less than $20 million may be eligible for compensation.

Also refer to the Valuation and Compensation Manual.

# Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>All-in-all-out production</td>
<td>A method of production in which all stock leave the premises (or area) followed by total restocking.</td>
</tr>
<tr>
<td>Animal byproducts</td>
<td>Products of animal origin that are not for consumption but are destined for industrial use (e.g., hides and skins, fur, wool, hair, feathers, hooves, bones, fertiliser).</td>
</tr>
</tbody>
</table>
| Animal Health Committee | A committee whose members are the Australian and state and territory CVOs, the Director of the CSIRO Australian Animal Health Laboratory, and the Director of Environmental Biosecurity in the Australian Government Department of Sustainability, Environment, Water, Population and Communities. The committee provides advice to SCoPI on animal health matters, focusing on technical issues and regulatory policy (formerly called the Veterinary Committee).  

*See also* Standing Council on Primary Industries |
| Animal products | Meat, meat products and other products of animal origin (e.g., eggs, milk) for human consumption or for use in animal feedstuff. |
| At-risk premises (ARP) | A premises in a restricted area that contains a susceptible animal(s) but is considered at the time of designation not to be an infected premises, dangerous contact premises, suspect premises or trace premises. The animal(s) on such a premises are subject to procedures such as heightened surveillance and movement restrictions that are applicable in the restricted 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.  

*See also* Chief veterinary officer |
| AUSVETPLAN | *Australian Veterinary Emergency Plan.* 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. |
| Broiler | A meat chicken.  

*See also* Meat chicken |
| Chick sexing | Determining the sex of day-old-chicks at the hatchery by inspecting characters that can indicate sex, namely the lining of the cloaca, the feather colour or the length of wing feathers. |
| Chief veterinary officer (CVO) | The senior veterinarian of the animal health authority in each jurisdiction (national, state or territory) who has responsibility for animal disease control in that jurisdiction.  

*See also* Australian chief veterinary officer |
Compartmentalisation: The process of defining, implementing and maintaining one or more disease-free establishments under a common biosecurity management system in accordance with OIE guidelines, based on applied biosecurity measures and surveillance, in order to facilitate disease control and/or trade.

Compensation: The sum of money paid by government to an owner for livestock or property that are destroyed for the purpose of eradication or prevention of the spread of an emergency animal disease, and livestock that have died of the emergency animal disease. See also Cost-sharing arrangements, Emergency Animal Disease Response Agreement.

Consultative Committee on Emergency Animal Diseases (CCEAD): The key technical coordinating body for animal health emergencies. Members are state and territory CVOs, representatives of CSIRO-AAHL and the relevant industries, and the Australian CVO as chair.

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).

Cost-sharing arrangements: Arrangements agreed between governments (national and state/territory) and livestock industries for sharing the costs of emergency animal disease responses. See also Compensation, Emergency Animal Disease Response Agreement.

Dangerous contact animal: A susceptible animal that has been designated as being exposed to other infected animals or potentially infectious products following tracing and epidemiological investigation.

Dangerous contact premises (DCP): A premises that may or may not contain a susceptible animal(s), including those not showing clinical signs, but that, following a risk assessment, is considered highly likely to contain an infected animal(s) or contaminated animal products, wastes or things, which present an unacceptable risk to the response if the risk is not addressed.

Declared area: A defined tract of land that is subjected to disease control restrictions under emergency animal disease legislation. Types of declared areas include restricted area, control area, infected premises, dangerous contact premises and suspect premises.

Decontamination: Includes all stages of cleaning and disinfection.

Depopulation: The removal of a host population from a particular area to control or prevent the spread of disease.

Destroy (animals): To kill animals humanely.

Disease agent: A general term for a transmissible organism or other factor that causes an infectious disease.

Disease Watch Hotline: 24-hour freecall service for reporting suspected incidences of emergency diseases — 1800 675 888.
Disinfectant | A chemical used to destroy disease agents outside a living animal.
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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.
Egg fillers or flats | Moulded fibre or plastic egg trays.
Egg pulp | A homogenous liquid made from either whole liquid egg, egg albumen or egg yolk, pasteurised for marketing as a liquid or frozen product.
Emergency animal disease (EAD) | A disease that is (a) exotic to Australia or (b) a variant of an endemic disease or (c) a serious infectious disease of unknown or uncertain cause or (d) a severe outbreak of a known endemic disease, and that is considered to be of national significance with serious social or trade implications.  
   See also  Endemic animal disease, Exotic animal disease
Emergency Animal Disease (EAD) Response Agreement | Agreement between the Australian and state/territory governments and livestock industries on the management of emergency animal disease responses. Provisions include participatory decision making, risk management, cost sharing, the use of appropriately trained personnel and existing standards such as AUSVETPLAN.
   See also  Compensation, Cost-sharing arrangements
Endemic animal disease | A disease affecting animals (which may include humans) that is known to occur in Australia.  
   See also  Emergency animal disease, Exotic animal disease
Enterprise | See  Risk enterprise
Epidemiological investigation | An investigation to identify and qualify the risk factors associated with the disease.
   See also  Veterinary investigation
Exotic animal disease | A disease affecting animals (which may include humans) that does not normally occur in Australia.  
   See also  Emergency animal disease, Endemic animal disease
Exotic fauna/feral animals | See  Wild animals
Fertile eggs | Eggs for hatching.
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 case of the disease to be diagnosed in a disease outbreak.

Index property The property on which the index case is found.

Infected premises (IP) A defined area (which may be all or part of a property) in which an emergency disease meeting the case definition exists or is believed to exist, or in which the causative agent of that emergency disease exists or is believed to exist.

Infected premises operations team (IPOT) A specially trained group of officials responsible for all disease control activity on a property.

Layer A breed of fowl for egg production.

Litter Material used on the floor of breeder and meat chicken sheds to absorb faeces. Wood shavings, rice hulls and waste paper are commonly used.

Local control centre (LCC) An emergency operations centre responsible for the command and control of field operations in a defined area.

Meat chicken A special breed of fowl for meat production.

Monitoring Routine collection of data for assessing the health status of a population.

See also Surveillance

Movement control Restrictions placed on the movement of animals, people and other things to prevent the spread of disease.

National management group (NMG) A group established to approve (or not approve) the invoking of cost sharing under the Emergency Animal Disease Response Agreement. NMG members are the Secretary of the Australian Government Department of Agriculture, Fisheries and Forestry as chair, the chief executive officers of the state and territory government parties, and the president (or analogous officer) of each of the relevant industry parties.

Native wildlife See Wild animals

Off-sex chick One sex that is not required for the next stage of breeding or production.


Operational procedures Detailed instructions for carrying out specific disease control activities, such as disposal, destruction, decontamination and valuation.
Owner

Owner of the premises, a grower, or anyone who has purchased the livestock, or person(s) responsible for the livestock. In the context of compensation, ‘owner’ may have a different meaning — for example, the owner may be the processing company.

Parent breeders

These are sometimes called multiplication breeders and are usually crossbred strains. They produce the commercial birds.

Pipping

Breaking of the shell by a chick.

Poultry

Chickens, turkeys, guinea fowl, ducks, geese, quails, pigeons, pheasants, partridges, ostriches and emus reared or kept in captivity.

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.

Product

The edible material produced at the establishment. See Animal products

Pullet

Immature female fowl — especially approaching maturity.

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 (RA)

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 that is potentially a major source of infection for many other premises. Includes intensive piggeries, feedlots, abattoirs, knackeries, saleyards, calf scales, milk factories, tanneries, skin sheds, game meat establishments, cold stores, artificial insemination centres, veterinary laboratories and hospitals, road and rail freight depots, showgrounds, field days, weighbridges, garbage depots.

Sanitisation

Decontamination of food products and surfaces that have direct contact with food. Disinfectants and methods approved for food products must be used in these cases.

Sensitivity

The proportion of affected individuals in the tested population that are correctly identified as positive by a diagnostic test. See also 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).

Setting  A number of eggs placed together for hatching.

Shell egg  Unbroken eggs, as distinct from pulp.

Specificity  The proportion of nonaffected individuals in the tested population that are correctly identified as negative by a diagnostic test.  
See also Sensitivity

Spent hen  A hen that has completed her productive life.

Stamping out  The strategy of eliminating infection from premises through the destruction of animals in accordance with the particular AUSVETPLAN manual, and in a manner that permits appropriate disposal of carcases and decontamination of the site.

Standing Council on Primary Industries (SCoPI)  The council of Australian national, state and territory and New Zealand ministers of agriculture that sets Australian and New Zealand agricultural policy (formerly the Primary Industries Ministerial Council).  
See also Animal Health Committee

Started pullet  Almost mature hen reared on a separate farm and transferred to the adult quarters.

State or territory control centre (SCC)  The emergency operations centre that directs the disease control operations to be undertaken in that state or territory.

Surveillance  A systematic program of investigation designed to establish the presence, extent or absence of a disease, or of infection or contamination with the causative organism. It includes the examination of animals for clinical signs, antibodies or the causative organism.

Susceptible animals  Animals that can be infected with a particular disease.

Suspect animal  An animal that may have been exposed to an emergency disease such that its quarantine and intensive surveillance, but not preemptive slaughter, is warranted. 
or An animal not known to have been exposed to a disease agent but showing clinical signs requiring differential diagnosis.

Suspect premises (SP)  Temporary classification of a premises that contains a susceptible animal(s) not known to have been exposed to the disease agent but showing clinical signs that require investigation(s).

Table eggs  Eggs for eating, as distinct from fertile eggs.

Trace premises (TP)  Temporary classification of a premises that contains susceptible animal(s) that tracing indicates may have been exposed to an infected animal(s), or contaminated animal products, wastes or things, and that requires investigation.
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.

Vaccination  
Inoculation of individuals with a vaccine to provide active immunity.

Vaccine  
A substance used to stimulate immunity against one or several disease-causing agents to provide protection or to reduce the effects of the disease. A vaccine is prepared from the causative agent of a disease, its products, or a synthetic substitute, which is treated to act as an antigen without inducing the disease.

- attenuated  
A vaccine prepared from infective or 'live' microbes that are less pathogenic but retain their ability to induce protective immunity.

Vector  
A living organism (frequently an arthropod) that transmits an infectious agent from one host to another. A biological vector is one in which the infectious agent must develop or multiply before becoming infective to a recipient host. A mechanical vector is one that transmits an infectious agent from one host to another but is not essential to the life cycle of the agent.

Veterinary investigation  
An investigation of the diagnosis, pathology and epidemiology of the disease.  
See also 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  
Animals of domestic species that are not confined or under control (eg cats, horses, pigs).

- exotic fauna  
Nondomestic animal species that are not indigenous to Australia (eg foxes).

Zoning  
The process of defining, implementing and maintaining a disease-free or infected area in accordance with OIE guidelines, based on geopolitical and/or physical boundaries and surveillance, in order to facilitate disease control and/or trade.

Zoonosis  
A disease of animals that can be transmitted to humans.
## Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AECL</td>
<td>Australian Egg Corporation Limited</td>
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<tr>
<td>AI</td>
<td>avian influenza</td>
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<tr>
<td>AUSVETPLAN</td>
<td>Australian Veterinary Emergency Plan</td>
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<td>CA</td>
<td>control area</td>
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<tr>
<td>CCEAD</td>
<td>Consultative Committee on Emergency Animal Diseases</td>
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<tr>
<td>CVO</td>
<td>chief veterinary officer</td>
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<tr>
<td>DAFF</td>
<td>Australian Government Department of Agriculture, Fisheries and Forestry</td>
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<tr>
<td>DCP</td>
<td>dangerous contact premises</td>
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<tr>
<td>EAD</td>
<td>emergency animal disease</td>
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<tr>
<td>EADRA</td>
<td>Government and Livestock Industry Cost Sharing Deed in Respect of Emergency Animal Disease Responses (EAD Response Agreement)</td>
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<tr>
<td>HPAI</td>
<td>highly pathogenic avian influenza</td>
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<tr>
<td>IBD</td>
<td>infectious bursal disease</td>
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<tr>
<td>IP</td>
<td>infected premises</td>
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<tr>
<td>LCC</td>
<td>local control centre</td>
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<td>LPAI</td>
<td>low pathogenicity avian influenza</td>
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<td>ND</td>
<td>Newcastle disease</td>
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<td>NMG</td>
<td>National Management Group</td>
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<tr>
<td>OIE</td>
<td>World Organisation for Animal Health</td>
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<tr>
<td>RA</td>
<td>restricted area</td>
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<td>SP</td>
<td>suspect premises</td>
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References


OIE publications


Further reading