AUSTRALIAN VETERINARY EMERGENCY PLAN

AUSVETPLAN

Enterprise manual

Poultry industry

Version 5.0

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

Copyright

ISBN 0 642 24506 1 (printed version)

ISBN 1 876 71438 7 (electronic version)

- This publication was created on June 2021. Laws, practices and regulations may have changed since that time. You should make your own inquiries as to the currency of relevant laws, practices and regulations, as these may have changed since publication of this work.

Text under development

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

Contact information

If you have any requests or inquiries concerning reproduction and rights, or suggestions or recommendations, you should address these to:

AUSVETPLAN – Animal Health Australia
Executive Manager, Emergency Preparedness and Response
PO Box 5116
Braddon ACT 2612
Tel: 02 6232 5522
email: aha@animalhealthaustralia.com.au

Approved citation

Animal Health Australia (2021). *Enterprise manual*: *Poultry industry* (version 5.0). Australian Veterinary Emergency Plan (AUSVETPLAN), edition 5, Canberra, ACT.

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.

Publication record

Edition 3
Version 3.0, 2013 (new manual)
Version 3.1, 2017 (minor update)

Edition 5
Version 5.0, 2021 (not a full update, incorporation into the Edition 5 format)

Contents

Tables

Figures

1 Introduction

1.1 This manual

1.1.1 Purpose

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.

1.1.2 Scope

This enterprise manual is aimed at both government officers and -- personnel who may be involved in emergency animal disease (EAD) preparedness. 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 industry personnel, including owners or managers, the manual provides guidelines on their responsibilities during an EAD outbreak, as required by the relevant government authorities, and 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.

1.1.3 Development

This manual has been produced in accordance with the procedures described in the **AUSVETPLAN *Overview***, and in consultation with Australian national, state and territory governments; the relevant livestock industries; nongovernment agencies; and public health authorities, where relevant.

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

1.2 Other documentation

This enterprise manual should be read and implemented in conjunction with:

- other AUSVETPLAN documents, including response strategies, operational and management manuals; and any relevant guidance and resource documents. The complete series of manuals is available on the Animal Health Australia website[1]
- relevant nationally agreed standard operating procedures (NASOPs)[2]. These procedures complement AUSVETPLAN and describe in detail specific actions undertaken during a response to an incident. NASOPs have been developed for use by jurisdictions during responses to emergency animal disease (EAD) incidents and emergencies

[1] www.animalhealthaustralia.com.au/our-publications/ausvetplan-manuals-and-documents
[2] www.animalhealthaustralia.com.au/what-we-do/emergency-animal-disease/nationally-agreed-standard-operating-procedures

- relevant jurisdictional or industry policies, response plans, standard operating procedures and work instructions
- relevant Commonwealth and jurisdictional legislation and legal agreements (such as the Emergency Animal Disease Response Agreement – EADRA[3], where applicable.

1.3 Training resources

EAD preparedness and response arrangements in Australia

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

[3] https://animalhealthaustralia.com.au/what-we-do/emergency-animal-disease/ead-response-agreement
[4] www.animalhealthaustralia.com.au/emergency-animal-disease-training-program

2 The Australian Industry

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 (AI) (highly pathogenic avian influenza; and low pathogenicity avian influenza, subtypes H5 and H7)
- Newcastle disease (ND)
- infectious bursal disease (IBD) 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).

2.1 Description

2.1.1 Chickens

A comprehensive review of the structure and dynamics of the Australian poultry industry was 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 practices 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 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.

---

5 https://animalhealthaust.sharepoint.com/sites/EPResponse/Shared%20Documents/ProjectManagement/AUSVETPLAN/ProductsAndDeliverables/Enterprise/PoultryIndustry/Current%20review/POULTRY-17-FINAL(16Mar17).doc#_ftn1

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.

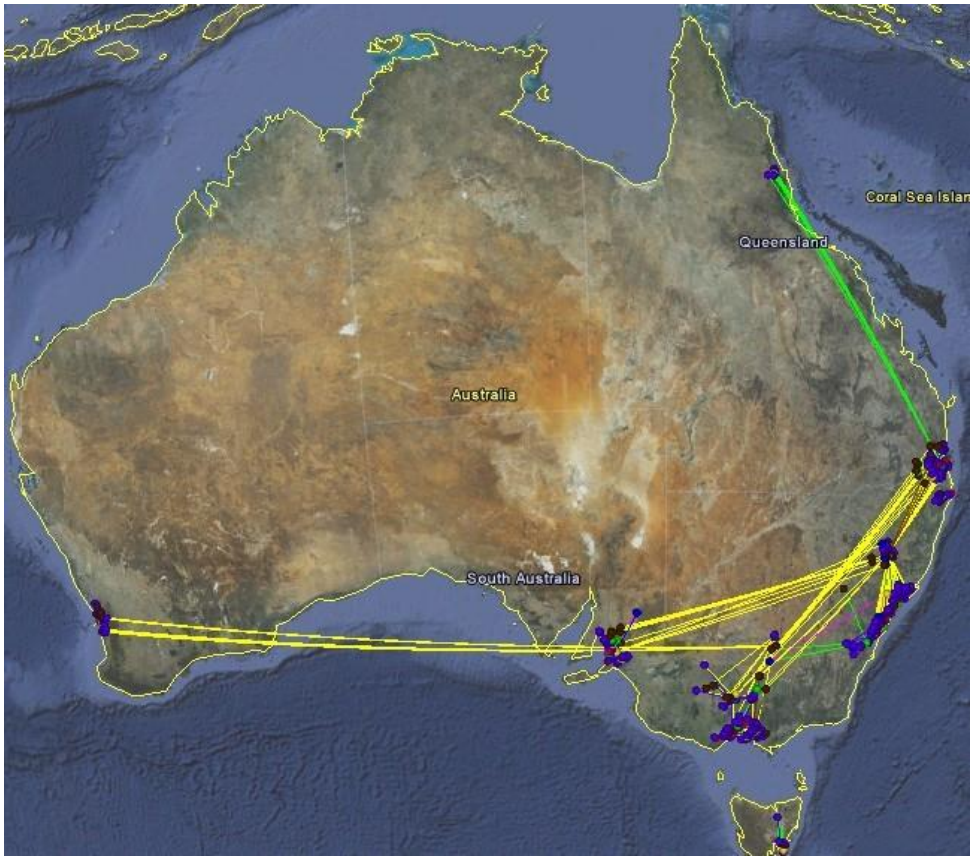

Figure 2.1 Geographical locations of meat chicken farms. Yellow line = movements from hatchery to farm of one-day old chickens; green line = movements of feed

[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.

For further information, please the Department of Agriculture, Water and the Environment's website[7].

[7] https://www.agriculture.gov.au/animal/health/livestock-movement-australia/livestock_movement_summary

2.2 Industry operations

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.

2.2.1 Stockfeed

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) 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).

2.2.2 Animal health

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.

2.2.3 Farming systems

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.

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, Water and the Environment, 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.

Primary breeding (great-grandparent/ grandparent) farms

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.

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.

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 2.3 (yellow lines).

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 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.

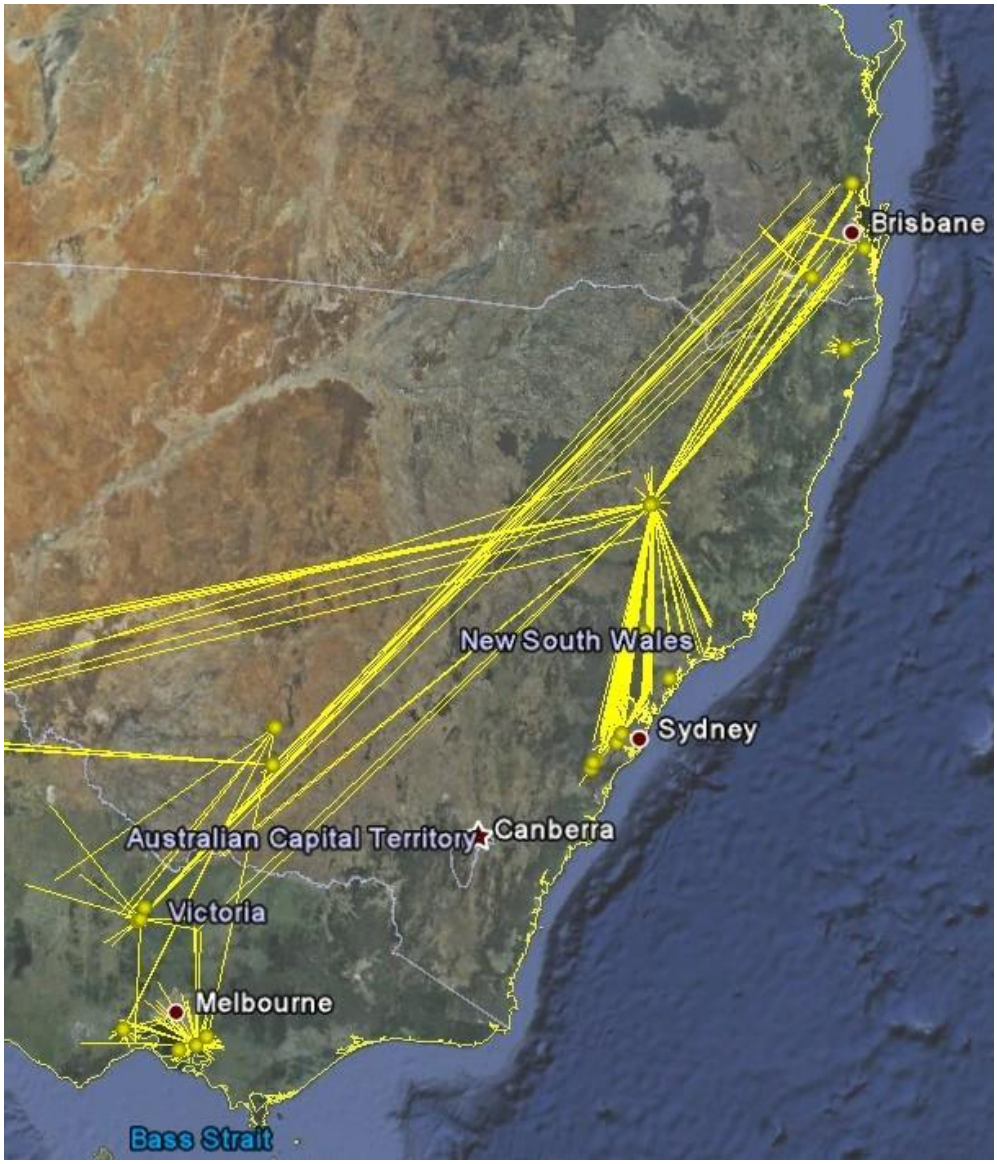

Figure 2.3 Hatcheries (yellow dots) with day-old meat chick movements (yellow lines) in southeast Australia.

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 five 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.

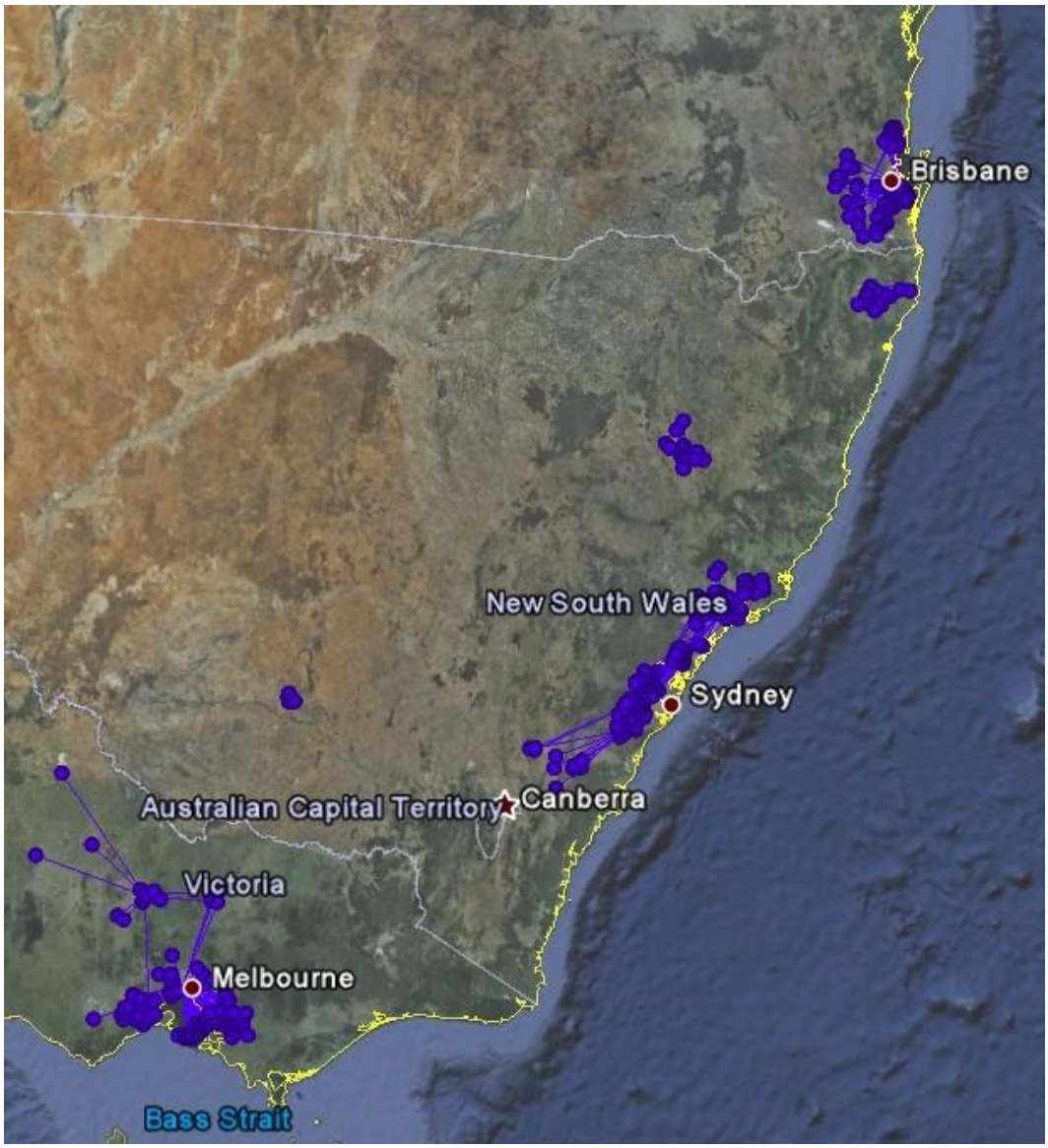

Figure 2.4 Location of broiler farms in Victoria, New South Wales and southern Queensland. Blue lines represent the flow of chickens to the processing plants (see also a close-up showing the Sydney Basin in Figure 2.5).

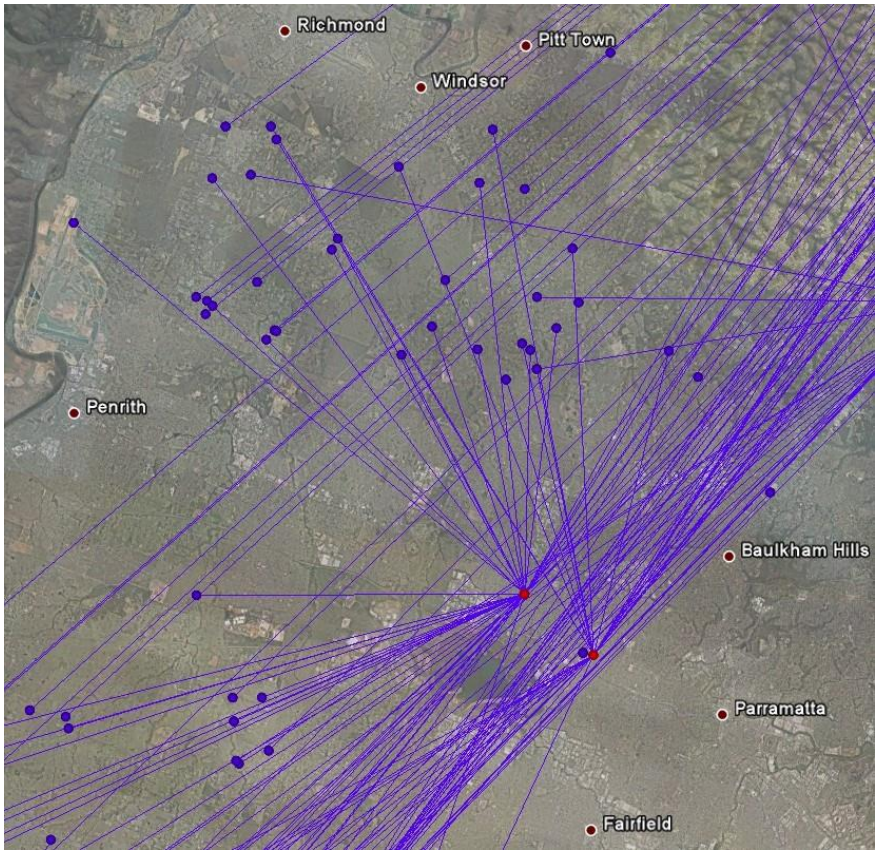

Figure 2.5 Close-up view of Sydney Basin broiler farms (blue dots) and delivery of market-ready broilers (blue lines) to processing plants (red dots).

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 six 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.

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.

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.

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.

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.

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.

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 (i.e. 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.

2.2.4 Waste

Because poultry waste is a potential source of infection for endemic diseases, precautions are usually taken with its disposal.

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.

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.

2.2.5 Carcass management

Dead birds are usually collected by a commercial operator, and then incinerated, buried, composted or rendered.

In a disease response, locations to bury birds needs to be provided by the enterprise. If there is no suitable disposal site at the enterprise, possible sites in the area should be identified prior to a response. If birds are being moved away from the infected premises to be disposed of, the responding government department will provide an approved route to avoid having diseased birds coming close to other poultry enterprises.

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**).

2.3 Industry regulations, standards and programs

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 2020), 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[8]. 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 Standards Australia (ESA), 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[9].

2.4 Legislation relevant to the industry

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.

[8] https://www.chicken.org.au/; https://www.australianeggs.org.au/
[9] https://www.australianeggs.org.au/for-farmers/egg-quality-standards/

2.5 Animal welfare

The Australian Model Codes of Practice for the Welfare of Animals include a welfare code for domestic poultry, currently in its fourth edition[10]. 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[11].

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.

2.6 Other industry-specific information

On-sell of spent hens

Spent hens (hens that have come to the end of their commercial laying life) are often sold as domestic (or pet) chickens to be housed in backyard domestic chook runs. This movement creates a high disease risk as backyard chickens are not able to be traced. In a disease outbreak such as avian influenza, a major issue arises with movement controls, as although movement of commercial poultry is banned, in many jurisdictions the movement of spent hens is not regulated, meaning that disease may continue to spread.

Backyarders

Many people have backyard chickens, however not all states have registers, licensing or biosecurity plans to enable easy contact of farmers and reduce disease risk. Without this information and preparation, backyard chickens are seen as high risk to the commercial poultry industry. Some of the practices of backyard chicken owners that present a disease risk include:

- Not vaccinating the bird against significant diseases
- Visiting places with other birds
- Re-using old egg cartons

It is important that both government and the industry bodies work together to ensure all chicken owners understand their responsibility in preventing disease spread and have appropriate biosecurity in place. Egg Farmers of Australia has worked with jurisdictions on an information sheet to help inform backyard chicken owners of their responsibilities. Refer to the Australian egg website for further information[12].

[10] The code can be downloaded from https://www.chicken.org.au/chicken-health-welfare/domestic-poultry-model-code-of-practice-for-the-welfare-of-animals/ or purchased from CSIRO publications

[11] http://www.animalwelfarestandards.net.au/land-transport/

[12] https://www.australianeggs.org.au/news/biosecurity-for-backyard-chooks

3 Emergency animal diseases and the industry

3.1 The risk of an EAD entering Australia

Live birds and poultry products are considered possible sources of Newcastle disease (ND), avian influenza (AI) and very virulent infectious bursal disease (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 Response strategy for each disease for more detailed information.

Importation of live poultry and table eggs is prohibited under import protocols; therefore, these sources are unlikely to be implicated in an emergency animal disease (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. Smuggled birds, products or byproducts are considered to be possible sources of ND and very virulent IBD.

People returning from overseas who have had contact with poultry could transfer a disease agent to Australian poultry flocks via their footwear or clothing. Secondary spread of infection from sick or dead birds going to a laboratory for diagnosis is also possible if adequate precautions are not taken.

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. Biosecurity precautions should be taken to prevent transfer of wild bird droppings into sheds on boots and farm equipment.

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.

Direct contact with infected birds is the most likely source of infection for all three diseases of concern. 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.

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). Micro-ingredients (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.

3.2 Risk of disease spread from the enterprise

3.2.1 Factors to consider in assessing risk of disease spread

Live animals

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.

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.

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.

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 (parents 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.

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 (e.g. 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.

Waste

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.

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.

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.

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.

Other factors

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. Biosecurity precautions should be taken to prevent transfer of wild bird droppings into sheds, and on boots and farm equipment.

3.3 Work health and safety

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.

4 Emergency animal disease preparedness and management

4.1 Australia's animal health services

Australian governments, primary industries and other stakeholders work closely together to prevent, detect, control and manage pest and disease outbreaks, and minimise impacts on the economy, environment and international trade. To do this effectively, governments, industries and stakeholders use consistent and collaborative approaches to determine national animal health priorities. The livestock industries are active partners in policy development, support targeted animal health activities and contribute to emergency responses.

4.2 National arrangements

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

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

Australia's response planning and coordination are enhanced by collaborative national arrangements between governments and industry, and other key stakeholders. These arrangements include:

- the *Government and livestock industry cost sharing deed in respect of emergency animal disease responses* (Emergency Animal Disease Response Agreement [EADRA])
- the Australian Veterinary Emergency Plan (AUSVETPLAN)
- training for EAD response personnel.

Coordination of the response to EAD incidents is further enhanced by the use of established consultative committees and management groups.

4.2.1 Emergency Animal Disease Response Agreement

The EADRA[13] is a legally binding agreement between the Australian Government, state and territory governments, livestock industries and Animal Health Australia (AHA). It supports a rapid and efficient response to an EAD outbreak.

The agreement establishes basic operating principles and guidelines, and defines roles and responsibilities of the parties that are involved. It provides for formal consultation and dispute resolution between government and industry on resource allocation, funding, training, risk management and ongoing biosecurity arrangements.

The signatories of the EADRA are committed to:

- minimising the risk of EAD incidents by developing and implementing biosecurity plans for their jurisdictions or industries

[13] 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/ .

- maintaining capacity to respond to an EAD by having adequate numbers of trained personnel available to fill the response functions specified in AUSVETPLAN
- participating in decision-making relating to EAD responses, through representation on the Consultative Committee on Emergency Animal Diseases (CCEAD) and the National EAD Management Group (NMG) established for the incident
- sharing the eligible response costs of EAD incursions using pre-agreed cost-sharing formulas.

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.

Table 4.1 describes the four disease categories and their respective cost-sharing arrangement.

Table 4.1 Disease categories and cost-sharing arrangements

Category	Cost-sharing arrangement
1	100% government
2	80% government 20% industry
3	50% government 50% industry
4	20% government 80% industry

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 AUSVETPLAN; sets standards for accounting, auditing and training personnel; and, provides the incentive for developing and maintaining government and industry biosecurity measures.

4.2.2 AUSVETPLAN

This enterprise manual is part of AUSVETPLAN – Australia's Veterinary Emergency Plan.

AUSVETPLAN is Australia's nationally agreed approach to responding to emergency animal diseases (EADs) of national significance. It comprises resources that support efficient, effective and coherent response to these diseases. It has been developed and agreed on by governments and relevant industries in non-outbreak times to ensure that a fast, efficient and effective EAD response can be implemented consistently across Australia with minimal delay.

AUSVETPLAN provides the contingency planning framework for Australia's response to EADs and is complemented by a range of other plans and resources, including:

- national and state/territory standard operating procedures for the implementation of certain response measures
- plans involving other areas of state and territory emergency management arrangements (eg police, local government)
- diagnostic resources
- training materials.

4.2.3 Training for emergency animal disease response personnel

It is a requirement of the EADRA that, where possible, signatories (governments and industries) use appropriately trained staff to undertake the response functions outlined in AUSVETPLAN for an EAD response.

Governments provide training in response functions for their personnel.

Animal Health Australia's Training Services project provides training for government personnel and representatives of the Australian livestock industries to help prepare them to participate in the CCEAD and NMG. The program also provides training for livestock industries representatives to prepare them to undertake the Liaison – Livestock Industry function in either a state coordination centre (SCC) or Local Control Centre (LCC).

The responsibilities of the SCC and LCC Liaison – Livestock Industry functions are documented in the **Control Centres Management Manual Part 2**[14].

4.3 Controlling an emergency animal disease incident

4.3.1 Governance

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.

EAD responses are planned and implemented at three levels — national, state or territory, and local.

The Australian Government (through the Department of Agriculture, Water and the Environment) provides international liaison during an EAD response; this includes market access negotiations, international reporting (eg to the World Organisation for Animal Health [OIE]), and coordinating access to overseas assistance through existing agreements. The Australian Government also provides national coordination for the response; more information is provided in the **Control Centres Management Manual Part 1**.

The CCEAD is the key technical coordinating body providing the link between the Australian Government, states and territories, industry, AHA and the NMG during an EAD response.

The NMG manages national policy and resourcing of the response. It determines whether a disease is eradicable and whether the direct costs of a response should be shared between Australia's governments and the relevant livestock industry/ies under the EADRA.

Both the CCEAD and the NMG base their recommendations and decisions on current information provided by the affected state or territory, and on guidance provided in AUSVETPLAN.

In an EAD outbreak, relevant state or territory animal health officials manage all aspects of its control and eradication according to a nationally agreed plan (Emergency Animal Disease Response Plan, EADRP).

The chief veterinary officer (CVO) of the state or territory in which an EAD outbreak occurs implements disease control measures as agreed in the EADRP and in accordance with relevant

[14] www.animalhealthaustralia.com.au/our-publications/ausvetplan-manuals-and-documents/

legislation. State/territory animal health (or in many cases, biosecurity) legislation provides broad powers to enable an effective response to EADs, 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.

An SCC may be established to coordinate response activities across the state or territory, in accordance with the strategic direction provided by the CVO, the CCEAD and the NMG. The SCC maintains overall control of the incident under the CVO and is able to give specific directions to the LCCs to ensure that the CVO's intentions are met.

Disease-control activities are managed from an LCC, usually established in the vicinity of the outbreak. The LCC is responsible for all operational activities within a defined area, assigned by the CVO, including investigations of reports of disease outbreaks, consultation with livestock producers and processors, specimen collection, property quarantine, valuation of livestock and property, livestock slaughter, livestock product tracing, treatment and disposal; and property decontamination.

Information on the structure, functions and responsibilities of the SCCs and LCCs is contained in the **Control Centres Management Manual, Part 1**. Detailed descriptions of functions and associated activities in an EAD response are contained in **Control Centres Management Manual, Part 2**.

The CVO makes ongoing decisions on follow-up disease control measures in consultation with the CCEAD and, where applicable, the NMG, based on epidemiological information about the outbreak.

4.3.2 Response measures

The response to an EAD will be determined by the nature of the outbreak, including:

- how early the outbreak is detected
- the extent of the outbreak
- the location of infected, suspected, trace and dangerous contact premises
- which species of livestock are affected
- the characteristics of the disease agent involved.

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 use of all or some of the following procedures:

- epidemiological assessment (to understand how the disease is behaving in that particular outbreak)
- quarantine of premises and/or movement controls on potentially infected or contaminated live animals, animal products, people, equipment, vehicles and other things
    - this will include a national livestock standstill if foot-and-mouth disease (FMD) is strongly suspected or confirmed; see the **FMD disease strategy** for more information
- tracing of potentially infected animals and potentially contaminated products and things (e.g. equipment, vehicles etc.)
- surveillance of susceptible animals
- biosecurity measures for people and equipment
- managing animal welfare

- valuation and compensation for livestock and property (including milk and milk products) destroyed as part of the EAD response
- destruction and disposal of infected and exposed susceptible animals, animal products and contaminated materials
- decontamination of infected premises
- restriction of the activities of certain enterprises
- an industry and public information program.

Other measures that may be used where necessary include:

- vaccination
- vector or wild animal control
- treatment of affected animals
- treatment of affected products
- use of sentinel animals
- zoning and compartmentalisation.

In some circumstances, a modified stamping-out approach may be used, for example by allowing the slaughter of animals at an accredited abattoir to produce a marketable product.

Sometimes, eradication is not considered feasible because the outbreak 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 selected, 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.

4.3.3 Overview of declared areas and premises classifications

Declared areas

'A defined tract of land that is subjected to disease control restrictions under emergency animal disease legislation. There are two types of declared areas: restricted area and control area.'

Declared areas are areas declared under jurisdictional legislation. They include restricted areas (RAs), which are subject to strict disease control measures, and control areas (CAs), which are disease-free buffers between an RA and the parts of Australia that are free of disease (the outside area – OA).

There are two types of legally declared area: restricted area and control area.

All declared areas need to be clearly identified and easily understood, so that all affected parties can recognise which area they are in, and what regulations and control measures are applicable to them.

Declared areas are declared by a chief veterinary officer (CVO) or their delegate, or a ministerial declaration, according to the appropriate legislation of the states and territories involved.

There are also other areas that are not legally declared, but are used for specific reasons:

- transmission areas, which are used for vector-borne diseases for epidemiological purposes, recognising that vectors are not confined by property boundaries
- the outside area is used to describe the rest of Australia outside the declared areas.

Area definitions for non-vector-borne diseases

Restricted area (RA)

'A relatively small legally declared area around infected premises and dangerous contact premises that is subject to disease controls, including intense surveillance and movement controls.'

A restricted area (RA) will be a relatively small declared area[15] (compared with a control area — see below) drawn with at least 'x' km radius[16] around all IPs and DCPs, and including as many SPs, TPs and DCPFs as practicable. Based on risk assessment, the RA is subject to intense surveillance and movement controls, and other relevant disease controls. The purpose of the RA is to minimise the spread of the EAD. The RA does not need to be circular but can have an irregular perimeter, provided that the boundary is initially an appropriate distance from the nearest IP, DCP, DCPF, SP or TP. Multiple RAs may exist within one control area.

The boundaries will be modified as new information becomes available, including from an official surveillance program. The actual distance in any one direction will be determined by factors such as terrain, the pattern of livestock movements, livestock concentrations, the weather (including prevailing winds), the distribution and movements of relevant wild (including feral) animals, and known characteristics of the disease agent. In practice, major geographic features and landmarks, such as rivers, mountains, highways and roads, are frequently used to demarcate the boundaries of the RA. Although it would be convenient to declare the RA on the basis of local government areas, this may not be practical, as such areas can be larger than the particular circumstances require.

Control area (CA)

'A legally declared area where the disease controls, including surveillance and movement controls, applied are of lesser intensity than those in a restricted area (the limits of a control area and the conditions applying to it can be varied during an incident according to need).'

A control area (CA) is a disease-free buffer between the RA and the outside area (see below). Specific movement controls, surveillance strategies, and other relevant disease controls will be applied within the CA to maintain its disease-free status and prevent spread of the disease into the outside area.

An additional purpose of the CA is to control movement of susceptible livestock for as long as is necessary to complete tracing and epidemiological studies, to identify risk factors and forward and backward risk(s).

The CA will be a larger declared area around the RA(s) — initially, possibly as large as the state or territory in which the incident occurs — where restrictions will reduce the risk of disease spreading from the RA(s). The CA will have a minimum radius of 'y' kilometres[17], encompassing the RA(s). The actual distance in any one direction will be determined by factors such as terrain, the pattern of livestock movements, livestock concentrations, the weather (including prevailing winds), the distribution and movements of relevant wild (including feral) animals, and known characteristics of the disease agent. In practice, major geographic features and landmarks, such as rivers, mountains, highways and roads, are frequently used to demarcate the boundaries of the CA. The boundary will be adjusted as confidence about the extent and distribution of the incident increases.

[15] As defined under relevant jurisdictional legislation.
[16] For specific details, refer to the relevant AUSVETPLAN response/disease strategy, www.animalhealthaustralia.com.au/programs/emergency-animal-disease-preparedness/ausvetplan
[17] For specific details, refer to the relevant AUSVETPLAN response/disease strategy, www.animalhealthaustralia.com.au/programs/emergency-animal-disease-preparedness/ausvetplan

In general, surveillance and movement controls will be less intense in the CA than in the RA, and disease-susceptible animals and their products may be more likely to be permitted to move under permit within and from the area than those originating from the RA.

Outside area (OA)

'The area of Australia outside the declared (control and restricted) areas.'

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

The OA will also be of interest for 'zoning'[18] and 'compartmentalisation'[19] for purposes of trade access, as well as for disease control (see below).

Area definitions for vector-borne diseases

Transmission area (TA)

'An area, *not* legally declared, that is used for vector-borne[20] diseases for epidemiological purposes, recognising that vectors are not confined by property boundaries. It includes IPs and, where possible, SPs, TPs, DCPs and DCPFs. A transmission area is subject to an increased level of surveillance, and has movement controls appropriate to its associated restricted area.'

Vector-borne diseases differ from non-vector-borne infectious diseases in that vectors cannot be contained by boundary fences. The transmission area (TA) is thus less concerned with property boundaries or definitions and more with including all infected vectors in the area surrounding known areas of transmission. It will be drawn around known sources of transmission, as evidenced by disease, seroconversion, trapping of infected vectors and any other confirmation of active disease transmission. There may be insufficient information at the start of a response to identify a TA, and an RA may be put in place before a TA can be determined.

A TA is not a legally declared area but will include all IPs and, where possible, all SPs, TPs, DCPs and DCPFs. In the presence of competent vectors, a TA of 'x' km[21] radius should be drawn. The TA does not need to be circular but can have an irregular perimeter, provided that the boundary is initially an appropriate distance from the nearest IP, DCP, DCPF, SP or TP. This distance will depend on the information gained about vector numbers and competence, environmental factors (e.g. prevailing winds, rainfall, temperature, humidity), and the number and distribution of infected and/or susceptible animals. In the absence of competent vectors, the TA may be reduced in size.

Restricted area (RA)

An RA will be a larger legally declared area around the TA. The boundary of the RA does not have to be circular or parallel to that of the TA but should be at least 'y' km from the boundary of the TA; this distance may be influenced by OIE standards or an official control program. The RA can include areas of known competent vector distribution. In general, surveillance may be less intense than in the TA, but movement controls will be the same.

---

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

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

[20] In most cases, a TA is focused on insect (arthropod) vectors.

[21] For specific details, refer to the relevant AUSVETPLAN response/disease strategy, www.animalhealthaustralia.com.au/programs/emergency-animal-disease-preparedness/ausvetplan

The boundary of the RA will be adjusted as confidence about the extent of the incident increases. It will take into account the relevant OIE *Terrestrial Animal Health Code* chapter on the disease and, if appropriate, OIE standards on zoning and compartmentalisation (Chapter 4.3[22]).

Other types of areas

It is possible that other types of areas (e.g. vaccination area or surveillance area), which are not legally declared, may be used for disease control purposes in some jurisdictions.

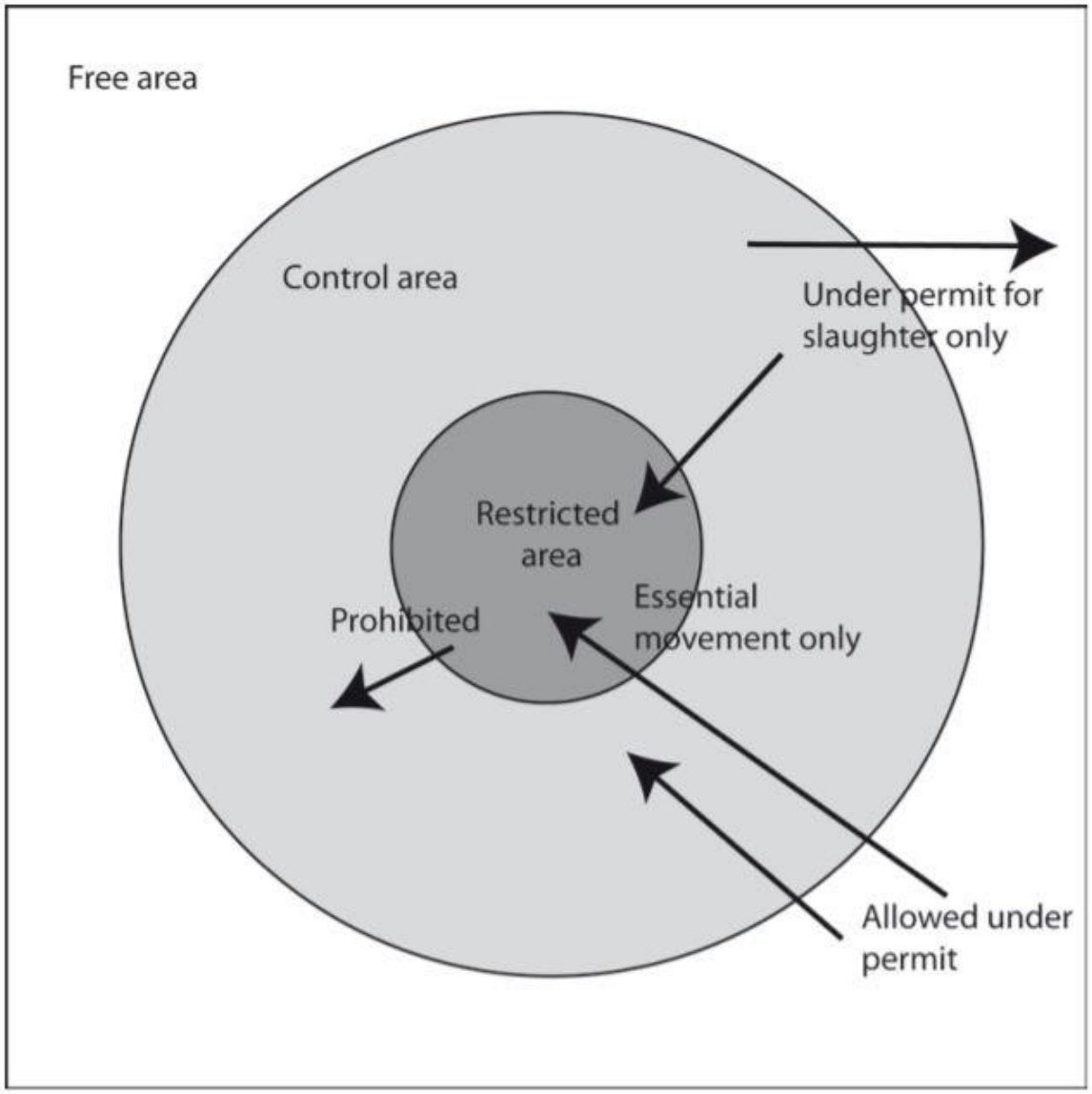

Figure 4.1 Schematic illustration of declared areas indicating standard movement controls

[22] www.oie.int/international-standard-setting/terrestrial-code/access-online

Premises classifications

All premises within declared areas are subject to classification for disease control management and monitoring purposes.

A particular property (or premises) must fit clearly into only one premises classification at a given time. The classifications and their abbreviations are (in alphabetical order):

- Approved disposal site (ADS)
- Approved processing facility (APF)
- At-risk premises (ARP)
- Dangerous contact premises (DCP)
- Dangerous contact processing facility (DCPF)
- Infected premises (IP)
- Premises of relevance (POR)
- Resolved premises (RP)
- Suspect premises (SP)
- Trace premises (TP)
- Unknown status premises (UP)
- Zero susceptible species premises (ZP).

In addition to these premises definitions, the following 'qualifiers' may be used to describe the outcome of a recent investigation, epidemiological risk assessment or other activity on premises where their status has not changed:

- Assessed negative (AN)
- Vaccinated (VN)
- Sentinels on site (SN).

For example, an ARP that has been determined by the relevant jurisdictional authority as being 'assessed negative' should be recorded as 'ARP-AN', and an IP that has had a completed vaccination program should be recorded as 'IP-VN'[23].

Not all classifications may be needed in a particular EAD response.

Classification of premises provides a framework for authorities to exercise legal powers over such premises, facilitates product tracking, and serves as a communication tool for reporting nationally and internationally on progress in the response.

[23] Some jurisdictions might have a date associated with the 'assessed negative' qualifier.

4.3.4 Use of declared areas and premises classifications in an EAD incident

When an EAD incident is first suspected, the premises involved would undergo a clinical and/or epidemiological investigation. If the case definition, as defined in the relevant AUSVETPLAN response strategy, is met[24] (i.e. the index case[25]), the relevant CVO or their delegate will determine the premises classification and may declare the premises an IP.

After the identification of the first IP, an RA and a CA may be declared[26]. A transmission area (TA) may also be defined, if appropriate. All premises within these areas will be classified. At the beginning of an EAD incident, the initial premises classifications would be infected premises (IP), at-risk premises (ARP), premises of relevance (POR), unknown status premises (UP) and zero susceptible species premises (ZP).

Any premises within the RA or CA will have only one classification at any one time. After an epidemiological investigation, clinical assessment, risk assessment or completion of control measures, a premises may be reclassified.

Once the first IP has been identified, intelligence gathering through veterinary epidemiological investigations would quickly lead to the identification of SPs and TPs. These would be high priorities for follow-up investigation by the relevant state or territory authorities. In a worst-case scenario, an SP could become an IP; therefore, SPs need to be investigated as a matter of very high priority. Similarly, investigation and risk assessment of a TP might identify it as an IP, DCP or DCPF. Both an SP and a TP might also be assessed as negative and qualified as SP-AN and TP-AN, and eventually reclassified as an ARP, POR or ZP.

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

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

[24] Note that case definitions are under development for some manuals and also that some diseases could be present without showing clinical signs.
[25] The first case to come to the attention of investigators.
[26] This is invariably the case with highly contagious diseases (e.g. foot-and-mouth disease, equine/avian/swine influenza, classical swine fever) but may not apply to less contagious diseases (e.g. Hendra virus, anthrax, Australian bat lyssavirus).

5 Industry preparedness

5.1 Biosecurity measures and the industry

5.1.1 Procedures for early detection 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 emergency animal diseases (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.

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, Water and the Environment (DAWE), and undergo targeted serological, virological and bacteriological monitoring, as well as routine investigation of elevated mortality by DAWE 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.

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.

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.

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.

Meat bird farm

Monitoring procedures on broiler farms are the same as on breeder farms.

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.

Layer (table egg) farm

Monitoring procedures on layer farms are the same as on breeder farms.

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.

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.

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.

Free-range egg layer and chicken meat farms

Monitoring procedures on free-range farms are the same as on breeder farms.

5.1.2 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.

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.

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, 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.

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.

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.

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 (Appendix 2). Ventilation systems, shed orientation and other aspects should be designed to minimise the transmission of aerosol infection from nearby sheds.

Poultry processing plants

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.

Layer (table eggs) 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. In addition, provision should be made for suitable disposal of broken eggs.

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.

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.

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**).

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 (Appendix 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.

5.1.3 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.

5.1.4 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 Appendix 3 of this manual).

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

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.

Primary breeding (great-grandparent/grandparent) farm

In addition to the general principles outlined above, 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 sanitation should also be undertaken at shed entry.

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.

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.

Meat bird farm

Hygiene and biosecurity procedures for staff and visitors on broiler farms are the same as on breeder farms.

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.

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.

Layer (table egg) farm

Hygiene and biosecurity procedures on layer farms are the same as on breeder farms (Appendix 2).

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.

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.

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.

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 Appendix 2). In addition, staff should focus on preventing entry of wild birds, feral animals and vermin into the premises.

5.1.5 Movement

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 **Response strategy.**

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 DAWE. 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.

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 DAWE export health certification.

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

Shed litter is trucked out for use as fertiliser.

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.

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.

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.

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.

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.

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.

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.

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.

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.

5.1.6 Internal quarantine

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.

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.

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.

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.

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.

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.

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 **Response strategy** permits it. Refer to the **Decontamination Manual** for further information about vehicle and cage washing facilities.

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.

Egg product processing plant

Shell eggs may be able to be isolated and stored for up to four 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.

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.

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.

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.

5.1.7 Disposal methods

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 DAWE. After successful completion of the quarantine period, any remaining waste is not subject to further quarantine.

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.

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.

Hatchery

Hatch waste goes to rendering plants or commercial dumps. Effluent is treated and goes to the sewer or settlement ponds.

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.

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.

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).

Egg product processing plant

Waste is treated and goes to the sewer, treatment plants and/or settlement ponds.

Stockfeed mill

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

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.

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.

5.1.8 Record keeping

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.

Post-entry quarantine facility — hatchery and farm

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

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.

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.

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.

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.

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.

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).

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.

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.

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.

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.

5.1.9 Water supply

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.

5.1.10 Wild and feral animal control

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.

Appendix 1

EMERGENCY ANIMAL DISEASES OF CONCERN FOR THE POULTRY INDUSTRY

The three major emergency animal diseases (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.

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. 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.

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 re-combination of various parts of their genome.

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.

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.

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 two 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 seven 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.

Appendix 2

RESPONSE PLAN WHEN ENTERPRISE IS IN A DECLARED AREA
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.

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

General principles

AUSVETPLAN **Response 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.

Considerations for specific establishments

The relevant **Response 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 **Response 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 infected premises (IPs), dangerous contact premises (DCPs) or suspect premises (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 2020; 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.

Minimising risks during continued operation

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 local control centre (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 **Response strategy**.

Occupational health and safety

Staff in contact with infected flocks should observe occupational health and safety precautions as specified in the **Response 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.

Other precautions

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 seven 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.

Appendix 3

RESPONSE PLAN WHEN ENTERPRISE IS AN INFECTED OR DANGEROUS CONTACT PREMISES

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 Appendix 2 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 **Response strategy**.

Continued operation of an enterprise classified as an infected or dangerous contact premises

This section applies to the enterprise only while it is an IP, DCP, SP or TP. Appendix 2 applies to premises that have not been declared or have been cleared of infection.

On an IP,[27] 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 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.

[27] Depending on exposure, some birds may also be destroyed on DCPs.

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 **Operational manual *Livestock Management and Welfare***.

Destruction of animals

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

Salvaging animals for slaughter

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.

Disposal

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.

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.

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 four 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 A3.1 summarises methods of destruction, disposal and decontamination for poultry enterprises.

Table A3.1 Destruction, disposal and decontamination for poultry enterprises

Item	Method
Live birds	Destruction
Carcasses	Burn, bury or compost
Product or byproduct	Cook, can, render, burn or bury
Animal housing and equipment	Detergents, alkalis,[28] Virkon, hypochlorite, steam, iodine complexes
Humans	Warm soapy water
Electrical equipment	Formaldehyde vapour[29]
Water (tanks or dams)	Drain to pasture where possible
Feed	Quarantine in silo or bury
Effluent	Bury, burn or treat with alkalis[30] or acids (citric or hydrochloric)
Manure	Bury, burn or treat with alkalis[31] or acids (citric or hydrochloric). Compost inside shed for 30 days
Human housing	Detergents, Virkon, hypochlorite
Machinery and vehicles	Detergents, alkalis[32]
Clothing	Detergents, alkalis,[33] Virkon, hypochlorite

[28] Alkalis corrode aluminium and its alloys.
[29] Formaldehyde vapour is dangerous and should be used in a confined space only under experienced supervision.
[30] Alkalis corrode aluminium and its alloys.
[31] Alkalis corrode aluminium and its alloys.
[32] Alkalis corrode aluminium and its alloys.
[33] Alkalis corrode aluminium and its alloys.

Aircraft	Detergents, Virkon

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.

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 **Response 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 **Response Strategy**).

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 4

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)[34] (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 (EADRP) 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 chief veterinary officer (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**.

[34] https://www.animalhealthaustralia.com.au/what-we-do/emergency-animal-disease/ead-response-agreement/

Appendix 5

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 Appendix 2 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 Appendix 5 of this manual and make appropriate changes to operations.

Glossary

Standard AUSVETPLAN terms

Term	Definition
Animal byproducts	Products of animal origin that are not for consumption but are destined for industrial use (eg hides and skins, fur, wool, hair, feathers, hooves, bones, fertiliser).
Animal Health Committee	A committee whose members are the chief veterinary officers of the Commonwealth, states and territories, along with representatives from the CSIRO Australian Centre for Disease Preparedness (CSIRO-ACDP) and the Australian Government Department of Agriculture, Water and the Environment. There are also observers from Animal Health Australia, Wildlife Health Australia, and the New Zealand Ministry for Primary Industries. The committee provides advice to the National Biosecurity Committee on animal health matters, focusing on technical issues and regulatory policy. *See also* National Biosecurity Committee
Animal products	Meat, meat products and other products of animal origin (eg eggs, milk) for human consumption or for use in animal feedstuff.
Approved processing facility (APF)	An abattoir, knackery, milk processing plant or other such facility that maintains increased biosecurity standards. Such a facility could have animals or animal products introduced from lower risk premises under a permit for processing to an approved standard.
At-risk premises (ARP)	A premises in a restricted area that contains a live susceptible animal(s) but is not considered at the time of classification to be an infected premises, dangerous contact premises, dangerous contact processing facility, suspect premises or trace premises.
Australian Chief Veterinary Officer	The nominated senior veterinarian in the Australian Government Department of Agriculture and Water Resources who manages international animal health commitments and the Australian Government's response to an animal disease outbreak. *See also* Chief veterinary officer
AUSVETPLAN	*Aus*tralian *Vet*erinary Emergency *Plan*. 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.
Carcase	The body of an animal slaughtered for food.
Carcass	The body of an animal that died in the field.
Chief veterinary officer (CVO)	The senior veterinarian of the animal health authority in each jurisdiction (national, state or territory) who has responsibility for animal disease control in that jurisdiction. *See also* Australian Chief Veterinary Officer

Term	Definition
Compartmentalisation	The process of defining, implementing and maintaining one or more disease-free establishments under a common biosecurity management system in accordance with OIE guidelines, based on applied biosecurity measures and surveillance, to facilitate disease control and/or trade.
Compensation	The sum of money paid by government to an owner for livestock or property that are destroyed for the purpose of eradication or prevention of the spread of an emergency animal disease, and livestock that have died of the emergency animal disease. *See also* Cost-sharing arrangements, Emergency Animal Disease Response Agreement
Consultative Committee on Emergency Animal Diseases (CCEAD)	The key technical coordinating body for animal health emergencies. Members are state and territory chief veterinary officers, representatives of CSIRO-ACDP and the relevant industries, and the Australian Chief Veterinary Officer as chair.
Control area (CA)	A legally declared area where the disease controls, including surveillance and movement controls, applied are of lesser intensity than those in a restricted area (the limits of a control area and the conditions applying to it can be varied during an incident according to need).
Cost-sharing arrangements	Arrangements agreed between governments (national and states/territories) and livestock industries for sharing the costs of emergency animal disease responses. *See also* Compensation, Emergency Animal Disease Response Agreement
Dangerous contact animal	A susceptible animal that has been designated as being exposed to other infected animals or potentially infectious products following tracing and epidemiological investigation.
Dangerous contact premises (DCP)	A premises, apart from an abattoir, knackery or milk processing plant (or other such facility), that, after investigation and based on a risk assessment, is considered to contain a susceptible animal(s) not showing clinical signs, but considered highly likely to contain an infected animal(s) and/or contaminated animal products, wastes or things that present an unacceptable risk to the response if the risk is not addressed, and that therefore requires action to address the risk.
Dangerous contact processing facility (DCPF)	An abattoir, knackery, milk processing plant or other such facility that, based on a risk assessment, appears highly likely to have received infected animals, or contaminated animal products, wastes or things, and that requires action to address the risk.
Declared area	A defined tract of land that is subjected to disease control restrictions under emergency animal disease legislation. There are two types of declared areas: restricted area and control area.
Decontamination	Includes all stages of cleaning and disinfection.
Depopulation	The removal of a host population from a particular area to control or prevent the spread of disease.

Term	Definition
Destroy (animals)	To kill animals humanely.
Disease agent	A general term for a transmissible organism or other factor that causes an infectious disease.
Disease Watch Hotline	24-hour freecall service for reporting suspected incidences of exotic diseases — 1800 675 888.
Disinfectant	A chemical used to destroy disease agents outside a living animal.
Disinfection	The application, after thorough cleansing, of procedures intended to destroy the infectious or parasitic agents of animal diseases, including zoonoses; applies to premises, vehicles and different objects that may have been directly or indirectly contaminated.
Disinsectisation	The destruction of insect pests, usually with a chemical agent.
Disposal	Sanitary removal of animal carcasses, animal products, materials and wastes by burial, burning or some other process so as to prevent the spread of disease.
Emergency animal disease	A disease that is (a) exotic to Australia or (b) a variant of an endemic disease or (c) a serious infectious disease of unknown or uncertain cause or (d) a severe outbreak of a known endemic disease, and that is considered to be of national significance with serious social or trade implications. *See also* Endemic animal disease, Exotic animal disease
Emergency Animal Disease Response Agreement	Agreement between the Australian and state/territory governments and livestock industries on the management of emergency animal disease responses. Provisions include participatory decision making, risk management, cost sharing, the use of appropriately trained personnel and existing standards such as AUSVETPLAN. *See also* Compensation, Cost-sharing arrangements
Endemic animal disease	A disease affecting animals (which may include humans) that is known to occur in Australia. *See also* Emergency animal disease, Exotic animal disease
Enterprise	*See* Risk enterprise
Enzyme-linked immunosorbent assay (ELISA)	A serological test designed to detect and measure the presence of antibody or antigen in a sample. The test uses an enzyme reaction with a substrate to produce a colour change when antigen–antibody binding occurs.
Epidemiological investigation	An investigation to identify and qualify the risk factors associated with the disease. *See also* Veterinary investigation
Epidemiology	The study of disease in populations and of factors that determine its occurrence.
Exotic animal disease	A disease affecting animals (which may include humans) that does not normally occur in Australia. *See also* Emergency animal disease, Endemic animal disease

Term	Definition
Exotic fauna/feral animals	*See* Wild animals
Fomites	Inanimate objects (eg boots, clothing, equipment, instruments, vehicles, crates, packaging) that can carry an infectious disease agent and may spread the disease through mechanical transmission.
General permit	A legal document that describes the requirements for movement of an animal (or group of animals), commodity or thing, for which permission may be granted without the need for direct interaction between the person moving the animal(s), commodity or thing and a government veterinarian or inspector. The permit may be completed via a webpage or in an approved place (such as a government office or commercial premises). A printed version of the permit must accompany the movement. The permit may impose preconditions and/or restrictions on movements. *See also* Special permit
In-contact animals	Animals that have had close contact with infected animals, such as noninfected animals in the same group as infected animals.
Incubation period	The period that elapses between the introduction of 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. *See also* Index property
Index property	The property on which the index case is found. *See also* Index case
Infected premises (IP)	A defined area (which may be all or part of a property) on which animals meeting the case definition are or were present, or the causative agent of the emergency animal disease is present, or there is a reasonable suspicion that either is present, and that the relevant chief veterinary officer or their delegate has declared to be an infected premises.
Local control centre (LCC)	An emergency operations centre responsible for the command and control of field operations in a defined area.
Monitoring	Routine collection of data for assessing the health status of a population or the level of contamination of a site for remediation purposes. *See also* Surveillance
Movement control	Restrictions placed on the movement of animals, people and other things to prevent the spread of disease.
National Biosecurity Committee (NBC)	A committee that was formally established under the Intergovernmental Agreement on Biosecurity (IGAB). The IGAB was signed on 13 January 2012, and signatories include all states and territories except Tasmania. The committee provides advice to the Agriculture Senior Officials Committee and the Agriculture Ministers' Forum on national biosecurity issues, and on the IGAB.
National management group (NMG)	A group established to approve (or not approve) the invoking of cost sharing under the Emergency Animal Disease Response Agreement. NMG members are the Secretary of the Australian

Term	Definition
	Government Department of Agriculture, Water and the Environment as chair, the chief executive officers of the state and territory government parties, and the president (or analogous officer) of each of the relevant industry parties.
Native wildlife	*See* Wild animals
OIE Terrestrial Code	OIE *Terrestrial animal health code.* Describes standards for safe international trade in animals and animal products. Revised annually and published on the internet at: www.oie.int/en/what-we-do/standards/codes-and-manuals/terrestrial-code-online-access.
OIE Terrestrial Manual	OIE *Manual of diagnostic tests and vaccines for terrestrial animals*. Describes standards for laboratory diagnostic tests, and the production and control of biological products (principally vaccines). The current edition is published on the internet at: www.oie.int/en/what-we-do/standards/codes-and-manuals/terrestrial-manual-online-access.
Operational procedures	Detailed instructions for carrying out specific disease control activities, such as disposal, destruction, decontamination and valuation.
Outside area (OA)	The area of Australia outside the declared (control and restricted) areas.
Owner	Person responsible for a premises (includes an agent of the owner, such as a manager or other controlling officer).
Polymerase chain reaction (PCR)	A method of amplifying and analysing DNA sequences that can be used to detect the presence of viral DNA.
Premises	A tract of land including its buildings, or a separate farm or facility that is maintained by a single set of services and personnel.
Premises of relevance (POR)	A premises in a control area that contains a live susceptible animal(s) but is considered at the time of classification not to be an infected premises, suspect premises, trace premises, dangerous contact premises or dangerous contact processing facility.
Prevalence	The proportion (or percentage) of animals in a particular population affected by a particular disease (or infection or positive antibody titre) at a given point in time.
Qualifiers	
– assessed negative	Assessed negative (AN) is a qualifier that may be applied to ARPs, PORs, SPs, TPs, DCPs or DCPFs. The qualifier may be applied following surveillance, epidemiological investigation, and/or laboratory assessment/diagnostic testing and indicates that the premises is assessed as negative at the time of classification.
– sentinels on site	Sentinels on site (SN) is a qualifier that may be applied to IPs and DCPs to indicate that sentinel animals are present on the premises as part of response activities (ie before it can be assessed as an RP).
– vaccinated	The vaccinated (VN) qualifier can be applied in a number of different ways. At its most basic level, it can be used to identify

Term	Definition
	premises that contain susceptible animals that have been vaccinated against the EAD in question. However, depending on the legislation, objectives and processes within a jurisdiction, the VN qualifier may be used to track a range of criteria and parameters.
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.
Resolved premises (RP)	An infected premises, dangerous contact premises or dangerous contact processing facility that has completed the required control measures, and is subject to the procedures and restrictions appropriate to the area in which it is located.
Restricted area (RA)	A relatively small legally declared area around infected premises and dangerous contact premises that is subject to disease controls, including intense surveillance and movement controls.
Risk enterprise	A defined livestock or related enterprise that is potentially a major source of infection for many other premises. Includes intensive piggeries, feedlots, abattoirs, knackeries, saleyards, calf scales, milk factories, tanneries, skin sheds, game meat establishments, cold stores, artificial insemination centres, veterinary laboratories and hospitals, road and rail freight depots, showgrounds, field days, weighbridges, garbage depots.
Sensitivity	The proportion of truly positive units that are correctly identified as positive by a test. *See also* Specificity
Sentinel animal	Animal of known health status that is monitored to detect the presence of a specific disease agent.
Seroconversion	The appearance in the blood serum of antibodies (as determined by a serology test) following vaccination or natural exposure to a disease agent.
Serosurveillance	Surveillance of an animal population by testing serum samples for the presence of antibodies to disease agents.
Serotype	A subgroup of microorganisms identified by the antigens carried (as determined by a serology test).
Serum neutralisation test	A serological test to detect and measure the presence of antibody in a sample. Antibody in serum is serially diluted to detect the highest dilution that neutralises a standard amount of antigen. The neutralising antibody titre is given as the reciprocal of this dilution.
Slaughter	The humane killing of an animal for meat for human consumption.
Special permit	A legal document that describes the requirements for movement of an animal (or group of animals), commodity or thing, for which the person moving the animal(s), commodity or thing must obtain prior written permission from the relevant government veterinarian or inspector. A printed version of the permit must accompany the movement. The permit may impose preconditions and/or restrictions on movements. *See also* General permit

Term	Definition
Specificity	The proportion of truly negative units that are correctly identified as negative by a test. *See also* Sensitivity
Stamping out	The strategy of eliminating infection from premises through the destruction of animals in accordance with the particular AUSVETPLAN manual, and in a manner that permits appropriate disposal of carcasses and decontamination of the site.
State coordination 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 pre-emptive slaughter, is warranted. *or* An animal not known to have been exposed to a disease agent but showing clinical signs requiring differential diagnosis.
Suspect premises (SP)	Temporary classification of a premises that contains a susceptible animal(s) not known to have been exposed to the disease agent but showing clinical signs similar to the case definition, and that therefore requires investigation(s).
Swill	Also known as 'prohibited pig feed', means material of mammalian origin, or any substance that has come in contact with this material, but does not include: (i) Milk, milk products or milk by-products either of Australian provenance or legally imported for stockfeed use into Australia. (ii) Material containing flesh, bones, blood, offal or mammal carcases which is treated by an approved process.[1] (iii) A carcass or part of a domestic pig, born and raised on the property on which the pig or pigs that are administered the part are held, that is administered for therapeutic purposes in accordance with the written instructions of a veterinary practitioner. (iv) Material used under an individual and defined-period permit issued by a jurisdiction for the purposes of research or baiting. [1] In terms of (ii), approved processes are: 1. rendering in accordance with the 'Australian Standard for the Hygienic Rendering of Animal Products' 2. under jurisdictional permit, cooking processes subject to compliance verification that ensure that a core temperature

Term	Definition
	of at least 100 °C for a minimum of 30 minutes, or equivalent, has been reached. 3. treatment of cooking oil, which has been used for cooking in Australia, in accordance with the 'National Standard for Recycling of Used Cooking Fats and Oils intended for Animal Feeds' 4. under jurisdictional permit, any other nationally agreed process approved by AHC for which an acceptable risk assessment has been undertaken and that is subject to compliance verification. The national definition is a minimum standard. Some jurisdictions have additional conditions for swill feeding that pig producers in those jurisdictions must comply with, over and above the requirements of the national definition.
Swill feeding	Also known as 'feeding prohibited pig feed', includes: • feeding, or allowing or directing another person to feed, prohibited pig feed to a pig • allowing a pig to have access to prohibited pig feed • the collection and storage or possession of prohibited pig feed on a premises where one or more pigs are kept • supplying to another person prohibited pig feed that the supplier knows is for feeding to any pig. This definition was endorsed by the Agricultural Ministers' Council through AGMIN OOS 04/2014.
Trace premises (TP)	Temporary classification of a premises that contains susceptible animal(s) that tracing indicates may have been exposed to the disease agent, or contains contaminated animal products, wastes or things, and that requires investigation(s).
Tracing	The process of locating animals, persons or other items that may be implicated in the spread of disease, so that appropriate action can be taken.
Unknown status premises (UP)	A premises within a declared area where the current presence of susceptible animals and/or risk products, wastes or things is unknown.
Vaccination	Inoculation of individuals with a vaccine to provide active immunity.
Vaccine	A substance used to stimulate immunity against one or several disease-causing agents to provide protection or to reduce the effects of the disease. A vaccine is prepared from the causative agent of a disease, its products or a synthetic substitute, which is treated to act as an antigen without inducing the disease.

Term	Definition
– adjuvanted	A vaccine in which one or several disease-causing agents are combined with an adjuvant (a substance that increases the immune response).
– attenuated	A vaccine prepared from infective or 'live' microbes that are less pathogenic but retain their ability to induce protective immunity.
– gene deleted	An attenuated or inactivated vaccine in which genes for non-essential surface glycoproteins have been removed by genetic engineering. This provides a useful immunological marker for the vaccine virus compared with the wild virus.
– inactivated	A vaccine prepared from a virus that has been inactivated ('killed') by chemical or physical treatment.
– recombinant	A vaccine produced from virus that has been genetically engineered to contain only selected genes, including those causing the immunogenic effect.
Vector	A living organism (frequently an arthropod) that transmits an infectious agent from one host to another. A *biological* vector is one in which the infectious agent must develop or multiply before becoming infective to a recipient host. A *mechanical* vector is one that transmits an infectious agent from one host to another but is not essential to the life cycle of the agent.
Veterinary investigation	An investigation of the diagnosis, pathology and epidemiology of the disease. *See also* Epidemiological investigation
Viraemia	The presence of viruses in the blood.
Wild animals	
– native wildlife	Animals that are indigenous to Australia and may be susceptible to emergency animal diseases (eg bats, dingoes, marsupials).
– feral animals	Animals of domestic species that are not confined or under control (eg cats, horses, pigs).
– exotic fauna	Nondomestic animal species that are not indigenous to Australia (eg foxes).
Wool	Sheep wool.
Zero susceptible species premises (ZP)	A premises that does not contain any susceptible animals or risk products, wastes or things.
Zoning	The process of defining, implementing and maintaining a disease-free or infected area in accordance with OIE guidelines, based on geopolitical and/or physical boundaries and surveillance, to facilitate disease control and/or trade.
Zoonosis	A disease of animals that can be transmitted to humans.

Abbreviations

Abbreviation	Full title
ACDP	Australian Centre for Disease Preparedness
AN	assessed negative
APF	approved processing facility
ARP	at-risk premises
AUSVETPLAN	Australian Veterinary Emergency Plan
CA	control area
CCEAD	Consultative Committee on Emergency Animal Diseases
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CVO	chief veterinary officer
DCP	dangerous contact premises
DCPF	dangerous contact processing facility
EAD	emergency animal disease
EADRA	Emergency Animal Disease Response Agreement
EADRP	Emergency Animal Disease Response Plan
EDTA	ethylenediaminetetraacetic acid (anticoagulant for whole blood)
ELISA	enzyme-linked immunosorbent assay
GP	general permit
IETS	International Embryo Transfer Society
IP	infected premises
LCC	local control centre
NASOP	nationally agreed standard operating procedure
NMG	National Management Group
OA	outside area
OIE	World Organisation for Animal Health
PCR	polymerase chain reaction
POR	premises of relevance
RA	restricted area
RP	resolved premises
SCC	state coordination centre
SP	suspect premises

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

References

ABARES (Australian Bureau of Agricultural and Resource Economics and Sciences) (2011). *Agricultural commodities*, September quarter 2011, ABARES, Canberra.

ABS (Australian Bureau of Statistics) (2011). *Livestock products*, cat. no. 72150.0, ABS, Canberra.

ACMF (Australian Chicken Meat Federation) (2020). *National Farm Biosecurity Manual for Chicken Growers*, ACMF, Sydney. www.farmbiosecurity.com.au/wp-content/uploads/2020/05/National-Farm-Biosecurity-Manual-for-Chicken-Growers_May2020.pdf

AHA (Animal Health Australia) (2020). *Farm Biosecurity Manual for the Duck Meat Industry*, AHA, Canberra. www.farmbiosecurity.com.au/wp-content/uploads/2020/04/Farm-Biosecurity-Manual-for-the-Duck-Meat-Industry_2020.pdf

DAFF (Australian Government Department of Agriculture, Fisheries and Forestry) (2009a). *National Farm Biosecurity Manual — Poultry Production*, DAFF, Canberra. www.agriculture.gov.au/pests-diseases-weeds/protect-animal-plant/bird-owners/poultry_biosecurity_manual

DAFF (Australian Government Department of Agriculture, Fisheries and Forestry) (2009b). *National Water Biosecurity Manual — Poultry Production*, DAFF, Canberra. www.agriculture.gov.au/pests-diseases-weeds/protect-animal-plant/bird-owners/water_biosecurity

Scolexia Animal and Avian Health Consultancy (2009).*Structure and Dynamics of Australia's Commercial Poultry and Ratite Industries*. Report prepared for the Australian Government Department of Agriculture, Fisheries and Forestry in 2005 (updated December 2009), Canberra.

Standards Australia (2006). *Construction of Premises and Hygienic Production of Poultry Meat for Human Consumption*, Standards Australia, Sydney. www.publish.csiro.au/book/5203

OIE publications

OIE (World Organisation for Animal Health) (2012). *Terrestrial Animal Health Code*, OIE, Paris, France. www.oie.int/international-standard-setting/terrestrial-code/access-online

OIE (World Organisation for Animal Health) (2012). *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals*, OIE, Paris, France. www.oie.int/international-standard-setting/terrestrial-manual/access-online

Further reading

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