



ANIMAL HEALTH IN
AUSTRALIA
System Report

FIRST EDITION



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Digital version

Please find a digital copy of the *Animal Health in Australia System Report* First Edition, as well as previous editions, at www.animalhealthaustralia.com.au/ahia.

FOREWORD

Since 1993, the structure of the *Animal Health in Australia* (AHiA) publication has largely remained the same. In 2020, the AHiA publication has been updated to a more contemporary and succinct format. This has included splitting the publication into a two-report format consisting of the *AHiA System Report* and the *AHiA Annual Report*.

Welcome to the first *AHiA System Report*. The *AHiA System Report* describes Australia's animal health system and the governance, surveillance, emergency management and animal welfare arrangements that support our unique animal health status. This report will only be updated whenever significant changes have occurred to our system, anticipated to be approximately once every three years.

The *AHiA Annual Report* will cover animal health and related matters that have arisen during that year, including relevant new policies and disease incidents. The first edition will cover 2019 and 2020, and is scheduled for publication in mid-2021, with later editions to be published annually.

Both AHiA reports will be available online at Animal Health Australia's website.

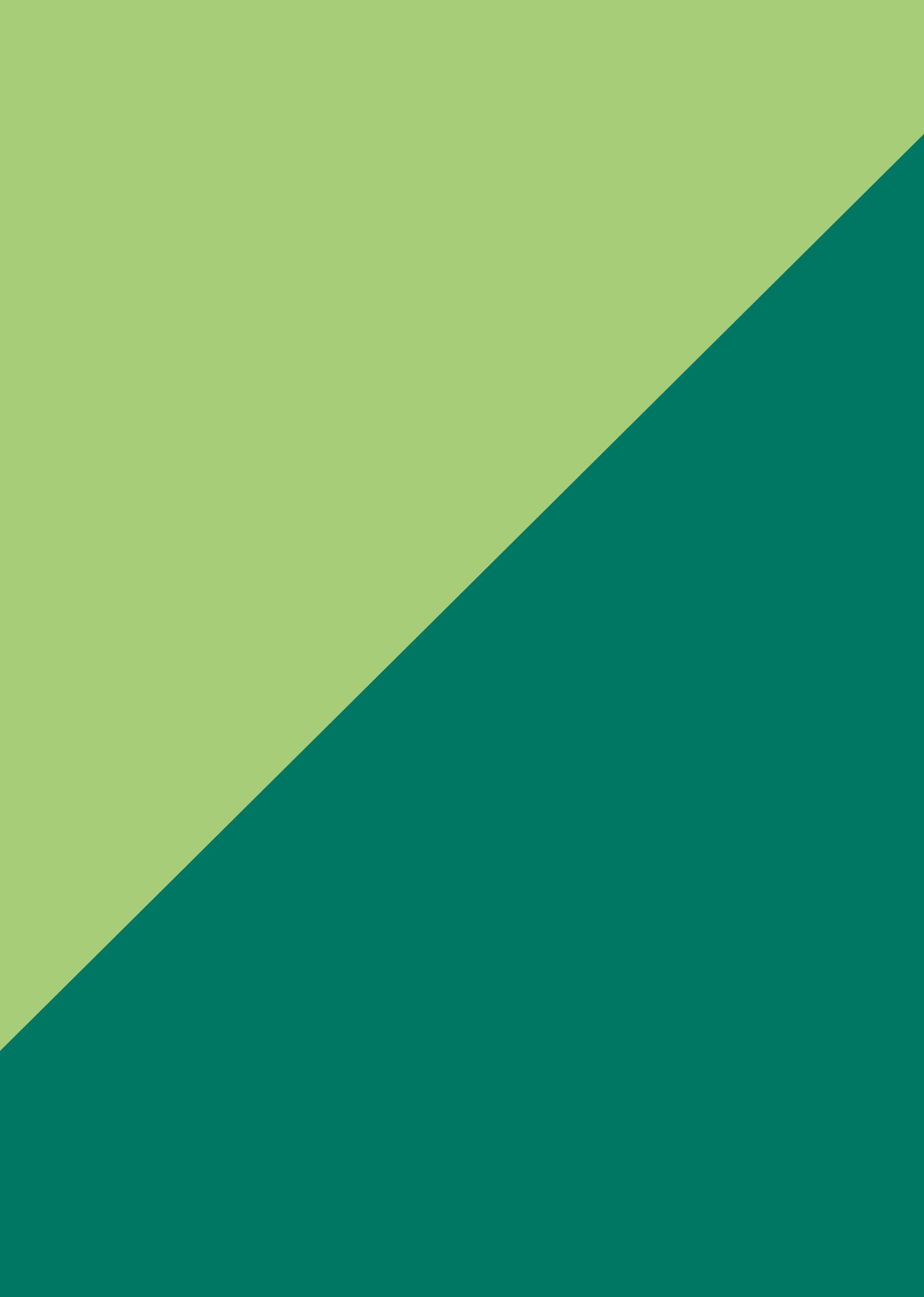
To complement AHiA reports, Australia's Department of Agriculture, Water and the Environment has developed a national five-year animal health plan for terrestrial animal industries, referred to as AnimalPLAN. AnimalPLAN is our vision for a better national animal health system by 2025 and identifies activities to be delivered over the next five years for the benefit of the terrestrial animal sector. AnimalPLAN will be available in 2021 and complements AQUAPLANs that have been successful in guiding the development of the aquaculture sector in Australia for more than 10 years.



Australia's first AnimalPLAN will take an important role in uniting the terrestrial animal sector by promoting collaboration at a national level between industries and jurisdictions, bringing overarching outcomes for Australia's animal health system and for consumers and importers of Australian animals and animal products. AnimalPLAN outcomes will be reported in future AHiA annual reports.

I express my sincere thanks to everyone who contributed to this report, and urge everyone to look after their health and the health of animals as we all face new animal health challenges.

Mark Schipp
Australian Chief Veterinary Officer



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Overview

Australia's animal health system relies on the government agencies, non-government organisations, commercial companies, universities and individuals that are involved in animal health and the livestock production chain.

Together, they maintain Australia's high standard of animal health and minimise negative impacts on productivity and trade.

Organisation of the animal health system

Chapter 1 describes the organisation of Australia's national animal health system, including the roles of government and non-government participants, committees, and partnerships. It details how the various components work together to deliver Australia's animal health services, manage Australia's border biosecurity risks and collaborate on cross-cutting One Health issues.

Terrestrial animal health

Chapter 2 provides information on Australia's national reporting system for terrestrial animal diseases and the arrangements for preparing for and responding to emergency animal diseases. It describes surveillance and monitoring programs that operate at the national level. These programs are in place to identify and treat risks from notifiable, emerging and exotic disease. The chapter also includes a section on control programs for endemic diseases of national significance.

Aquatic animal health

Chapter 3 provides details about Australia's national aquatic animal health policies and programs. Australia's national aquatic animal health arrangements are in place to support aquaculture productivity, product quality, trade, fisheries resource management and biodiversity. A range of aquatic surveillance and research activities, together with disease emergency preparedness programs, operate to maintain the excellent health status of Australia's aquatic animal populations.

Traceability, biosecurity and quality assurance

Chapter 4 outlines the collaboration between federal, state and territory governments and industry to provide traceability, quality assurance (QA) and biosecurity programs and services for Australia's livestock. Livestock identification, biosecurity measures and QA initiatives are an integral part of national preparedness against disease and maintenance of animal health. This

chapter highlights Australia's National Livestock Identification Scheme, which delivers systems for the supply chain to record livestock movements, creating lifetime traceability for all cattle, goats, pigs and sheep.

Animal health laboratories

Chapter 5 describes Australia's national animal health laboratory network, including its key functions and programs. Australia's animal health laboratories are an integral part of the national health system and play a crucial role in disease preparedness and response. These laboratories are operated by the Commonwealth Scientific and Industrial Research Organisation, state and territory governments, universities and the private sector. They undertake surveillance, diagnostic testing, QA and research for endemic and emergency animal diseases.

Animal welfare

Chapter 6 outlines Australia's strong approach to managing farm animal welfare. Each state and territory is responsible for implementing and enforcing its own animal welfare legislation. Organisations in the livestock, zoo and aquarium industries also have arrangements in place to improve and guide animal welfare.

One Health

Chapter 7 focuses on One Health initiatives in Australia. The goal of One Health is to encourage communication and collaboration between multiple disciplines to improve health outcomes for people, animals and the environment. A One Health approach is critical for responding to the growing global threat of antimicrobial resistance and emerging zoonotic diseases, with approximately 70% of emerging infectious diseases in humans originating from animals. The current SARS-CoV-2 pandemic (COVID-19 disease) provides an alert about strengthening global One Health systems to reduce the risk of zoonotic pandemics.



1

Organisation of the animal health system



1.1 Introduction

Effective national surveillance and control of animal diseases in Australia relies on an integrated system and cooperative partnerships between government agencies, organisations, commercial companies and individuals involved in animal industries. Australia's animal health system includes all those involved in animal health and the livestock and aquatic production chains, including government agencies, commercial companies, universities and individuals.

The Australian Government Department of Agriculture, Water and the Environment advises on and assists with the coordination of national animal health policy. This department is responsible for international animal health matters, including biosecurity, export certification, trade, and reporting to the World Organisation for Animal Health (OIE). Under the Australian Constitution, individual state and territory governments are responsible for animal health matters within their borders. Such matters include disease surveillance and control, emergency preparedness and response, chemical residues in animal products, livestock identification and traceability and animal welfare. National coordination for animal health matters is supported through the Animal Health Committee (AHC) (see Section 1.2).

Australian governments work with livestock industries to advance national animal health priorities. The livestock industries are active partners in policy development, supporting targeted animal health activities and contributing to veterinary emergency responses.

Links are maintained with human health agencies as part of a One Health approach, particularly for zoonoses (diseases that are transmissible between animals and humans) and antimicrobial resistance (AMR) (see Chapter 7).

1.2 Consultative committees, organisations and partnerships

National committees

Consultative committees ensure that all components of the animal¹ health system work together to serve the interests of Australia. The committees advise and support senior national departmental and ministerial forums: the Agriculture Senior Officials' Committee (AGSOC); and the Agriculture Ministers' Forum (AGMIN). Figure 1.1 illustrates the structure of the governmental animal health management committees and organisation in Australia.

National Biosecurity Committee

The National Biosecurity Committee (NBC) provides strategic leadership across state and

territory governments to develop and oversee implementation of national approaches and policies for emerging and ongoing biosecurity matters. NBC membership comprises senior officials from the Australian, state, territory and New Zealand governments, with Animal Health Australia (AHA), Plant Health Australia and the Australian Local Government Association included as observers. NBC is supported by the National Biosecurity Emergency Preparedness Expert Group, National Biosecurity Community and Engagement Network, and four sectoral committees (AHC, Environment and Invasives Committee, Marine Pest Sectoral Committee and Plant Health Committee). AHC is the key government committee focusing on national animal health issues.

NBC advises agriculture senior officials and ministers on progress in implementing the Intergovernmental Agreement on Biosecurity (IGAB).² IGAB, which came into effect in January 2019, is an agreement between the Commonwealth and all state and territory governments (except

Australia's animal health system



¹ Both terrestrial and aquatic animals.

² www.agriculture.gov.au/biosecurity/partnerships/nbc/intergovernmental-agreement-on-biosecurity

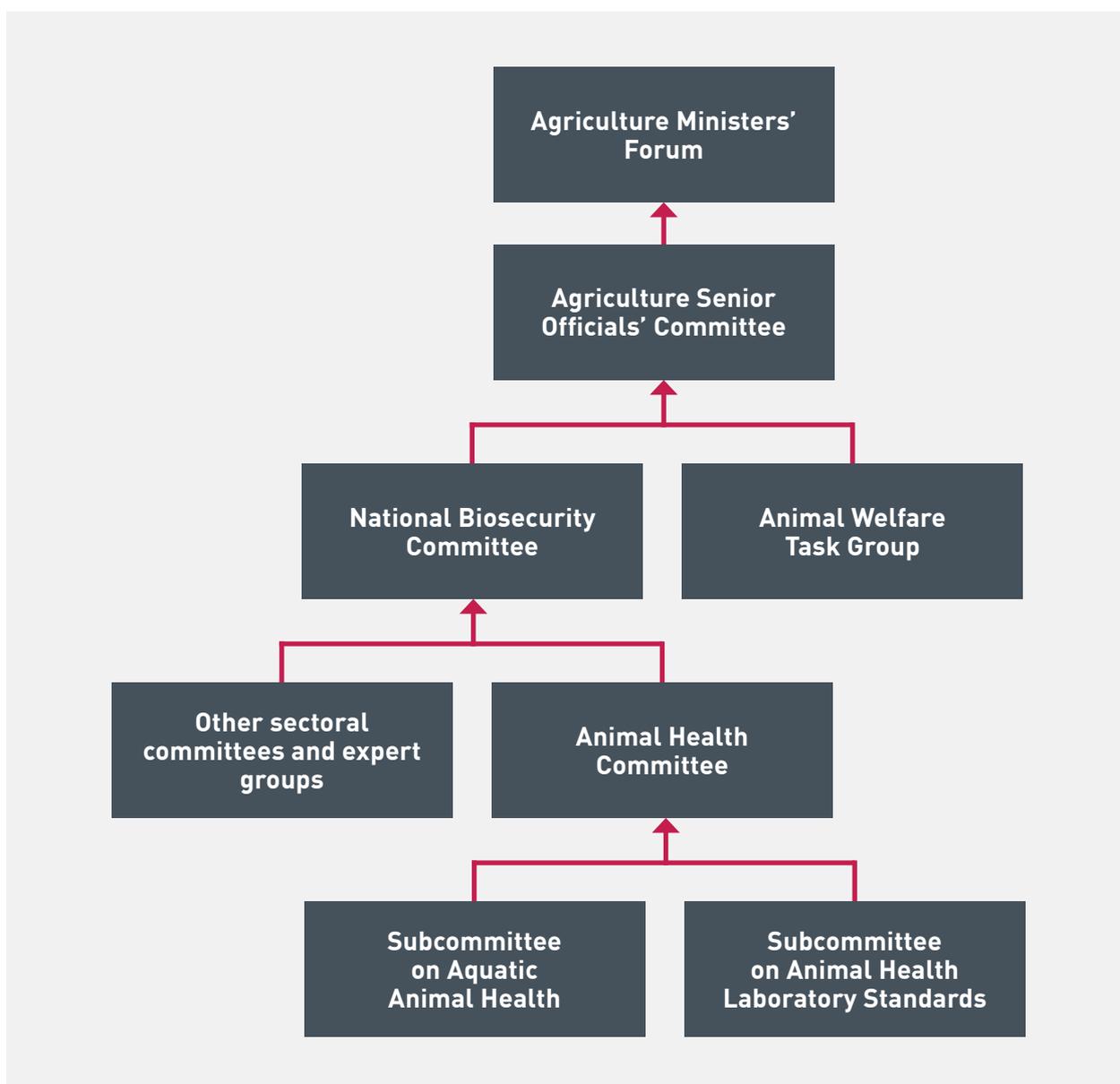


Figure 1.1 Key national government animal health management committees in Australia

Tasmania) setting out commitments for the Australian Government and state and territory governments to improve national biosecurity outcomes.

Animal Health Committee

AHC³ provides the Australian, state and territory governments with nationally coordinated scientific advice on animal health issues through NBC and AGSOC. AHC leads the development of government policies, programs, operational strategies and standards in national animal health, animal biosecurity and veterinary public health.

AHC members comprise the Australian, state and territory chief veterinary officers (CVOs), and the director of the Australian Centre for Disease Preparedness (ACDP, formerly the Australian Animal Health Laboratory [AAHL]).

AHC observers are AHA, Wildlife Health Australia (WHA), and the Australian Government Department of Health. There is also participation from the New Zealand government on relevant matters.

AHC is advised on aquatic animal health issues by its Subcommittee on Aquatic Animal Health (SCAAH), and on national animal health laboratory matters by its Subcommittee on Animal Health Laboratory Standards (SCAHL). Specialist ad hoc working groups advise AHC on technical or policy issues as required.

3 www.agriculture.gov.au/animal/health/committees/ahc

AHC communicates and consults with its animal industry stakeholders through AHA industry forums and stakeholder sessions during AHC meetings. In addition, aquatic industries are consulted through the National Aquaculture Council and the Australian Fisheries Management Forum. Stakeholders from the zoo or wild (including feral) animal sector are consulted through WHA.

Subcommittee on Aquatic Animal Health

SCAAH provides policy, scientific, technical and strategic advice to AHC on aquatic animal health issues relating to capture fisheries, recreational fishing, aquaculture and the ornamental fish industry. SCAAH membership comprises representatives from the Australian, state, territory and New Zealand governments, ACDP, Australian and New Zealand universities and includes an observer from the National Aquaculture Council.

Subcommittee on Animal Health Laboratory Standards

SCAHLs operates as the national committee for animal and veterinary public health laboratories in Australia, and is managed by governments, universities and the private sector. SCAHLs maintains professional and technical standards for animal health laboratory services within member laboratories, and develops and evaluates new tests. This includes overseeing the Australian National Quality Assurance Program and producing Australian and New Zealand Standard Diagnostic Procedures. SCAHLs also monitors and facilitates preparedness for emergency animal diseases (EADs) through the Laboratories for Emergency Animal Disease Diagnosis and Response network (see Chapter 5).

Animal Welfare Task Group

The Animal Welfare Task Group develops national animal welfare policies in areas referred to it by AGSOC and AGMIN. The group includes officials from the Australian, state, territory and New Zealand governments. The task group is developing Australian animal welfare standards and guidelines for several types of animals. The standards and guidelines are developed with advice provided through open public consultation and Stakeholder Advisory Groups, which include industry representatives, veterinarians, researchers and animal welfare organisations.

1.3 Government– industry committees and organisations

Consultative Committee on Emergency Animal Diseases (terrestrial and aquatic)

The Consultative Committee on Emergency Animal Diseases (CCEAD)⁴ is convened in the event of an emergency terrestrial or aquatic EAD outbreak. Terrestrial CCEAD is chaired by the Australian CVO and comprises AHC members and representatives from the Department of Agriculture, Water and the Environment, ACDP, AHA and industry bodies. CCEAD reports to the National Management Group. Further information about CCEAD's role in EAD outbreaks is in Chapter 2. Aquatic CCEAD has similar membership to terrestrial CCEAD and is outlined in Chapter 3.

National Management Group

The National Management Group (NMG) makes decisions on whether or not to support national eradication programs through cost-sharing arrangements set out in the Emergency Animal Disease Response Agreement for terrestrial animals. NMG consists of Chief Executive Officers of the Australian, state and territory governments responsible for agriculture/biosecurity, and affected industry organisations.

Animal Health Australia

AHA is the trusted and independent national animal health body in Australia, bringing together government and industry to deliver animal health and biosecurity. Established in 1996, AHA's members include the Australian, state and territory governments, major terrestrial livestock⁵ industries, and other animal health organisations and service providers.

Through the coordination and management of national projects, AHA works in partnership with its members and other stakeholders to enhance

⁴ www.agriculture.gov.au/animal/health/committees/ccead

⁵ For AHA definitional purposes, livestock are animals kept for use or profit, including any class of cattle, sheep, goats, pigs, horses (including mules and donkeys), poultry, emus, ostriches, alpaca, deer, camels, buffalo and farmed aquatic species.

Members of AHA

Governments



Livestock industries



Associate members



preparedness for EADs and to improve animal health, strengthen biosecurity, enhance market access and foster the resilience and integrity of the Australian animal health system.

The strength of AHA is the ability of its members, both government and industry, to work together to deliver a world-class system for managing livestock biosecurity risks to help Australia maintain its coveted animal health status.

AHA continues to improve national animal health policy and agricultural prosperity through the following three strategic priorities:

- Prepared and ready: enhancing Australia's capability to detect and respond to EADs, supporting Australia's domestic and international markets.
- Better health and biosecurity practices: strengthening on-farm and supply chain biosecurity practices – with a focus on prevention and resilience – to protect animal health, welfare and product integrity.
- Connecting systems for stronger biosecurity: delivering cross-sectoral outcomes that improve regional, state and national biosecurity systems, contributing to the protection of markets and the identification of new opportunities.

Information is provided on terrestrial animal health management in Australia in Chapter 2, and on aquatic animal health management in Australia in Chapter 3.

Wildlife Health Australia

WHA is the national coordinating body for wildlife health in Australia. It is a not-for-profit association initiated by the Australian Government, and is funded through a cost-share model with the Australian Government and all state and territory governments, with significant in-kind support from other stakeholders.

WHA focuses on the health of free-ranging populations of wild animals and the possible impacts on Australia's animal and human health, natural environment, biodiversity and economy.

WHA has more than 650 members, including wildlife health professionals, wildlife carers,

private practitioners, institutional representatives from national, state and territory departments of agriculture, human health and environment, universities, zoos, hunting groups, conservation groups and other industries and diagnostic pathology service providers. Australia's OIE Focal Point for Wildlife is within WHA and provides support to Australia's OIE Delegate.

WHA's activities include:

- coordinating national wildlife disease surveillance programs and focus groups;
- managing Australia's national database of wildlife health information;
- organising and providing national communication about wildlife disease and emerging incidents;
- participating in the development of regional and national strategies for wildlife health emergency preparedness and response;
- facilitating, monitoring and supporting field investigations of disease incidents;
- advancing education and training in wildlife health;
- publishing fact sheets about diseases of national importance in wildlife; and
- providing information about wildlife health to the community.

SAFE MEAT

SAFEMEAT⁶ is a partnership between peak meat industry bodies⁷ and the Australian, state and territory governments. Reporting to AGSOC and peak industry councils, SAFEMEAT oversees and promotes sound management systems to deliver safe and hygienic products to the marketplace.

Programs and systems developed by SAFEMEAT include:

- targeted residue-monitoring programs for the export red meat industry, which are undertaken by the National Residue Survey;

⁶ www.safemeat.com.au

⁷ Australian Livestock Exporters' Council Ltd, Meat & Livestock Australia, Sheep Producers Australia, WoolProducers Australia, Cattle Council of Australia, Australian Lot Feeders' Association, Australian Meat Industry Council, Australian Dairy Farmers Ltd, Australian Pork Ltd, Australian Livestock & Property Agents Association, Australian Livestock Markets Association, Goat Industry Council of Australia and AHA.

- the National Livestock Identification System, which has been developed for cattle, sheep, goats and pigs;
- a system of National Vendor Declarations about the food safety status of cattle, sheep, goats and pigs that are being traded; and
- strategies for animal disease issues affecting food safety, including implications of transmissible spongiform encephalopathies such as bovine spongiform encephalopathy.

The SAFEMEAT partnership provides a valuable mechanism for industry to maintain a high level of food safety and market access for its products.

1.4 Service delivery

State and territory animal health services

Under the Australian Constitution, state and territory governments are responsible for animal health services within their respective jurisdictions. State and territory animal health services aim to protect the interests of livestock producers and the community by providing world-class biosecurity systems that benefit the economy, the environment and public wellbeing. This is achieved through a combination of legislation and service delivery. Although the mechanisms differ between jurisdictions, AHC ensures a harmonised outcome by coordinating the jurisdictions' approaches to national animal health issues.

State and territory governments develop and administer legislation relating to: surveillance, control, investigation and reporting of diseases; chemical residues and contaminants; and animal welfare.

Services are through government-appointed or government-accredited animal health personnel – district veterinarians, regional veterinary officers and local biosecurity officers – who administer the relevant state and territory legislation and provide extension services to industry and the community. The work of these personnel includes:

- surveying, controlling, investigating and reporting on livestock diseases of interest, including EADs;
- contributing to the control of specified endemic livestock diseases, in partnership with relevant livestock industries;

- monitoring and ensuring compliance with animal identification systems and the use of vendor declarations;
- maintaining appropriate controls on the movement of livestock to ensure a high level of biosecurity;
- investigating reports of chemical contamination in livestock products and implementing response plans to protect consumers from chemical residues;
- contributing to producer awareness of best practice in local livestock management systems;
- monitoring the health of feral animals and native wildlife to detect the emergence of new or exotic diseases; and
- educating livestock producers, industry organisations and service providers (transport and marketing) about their legislative obligations, relevant biosecurity, welfare and market assurance programs, and technological developments.

Surveillance and other collaborative activities

State and territory animal health personnel conduct surveillance and applied research projects. Authorities are constantly alert to the possible emergence of new infectious diseases, recognising that early detection of disease facilitates more rapid control and eradication. This work requires close links with livestock producers, industry and community organisations, private veterinarians, veterinary laboratories, research organisations, livestock transport and marketing agents, and other stakeholders.

State and territory animal health personnel provide disease diagnostic services, particularly for cases that are not routinely managed by private veterinarians, such as detailed investigations for exotic and emerging diseases. Field staff are supported by government or government-contracted veterinary diagnostic laboratories, which provide reports to government. Many of the advances in Australia in understanding and managing livestock diseases have come from the partnership between government laboratories and field workers.

Data gathered during these activities are recorded in disease information databases to maintain disease

profiles for districts and individual properties. Terrestrial animal health information collected and analysed by state and territory animal health systems is collated through the National Animal Health Information System. Aquatic animal disease status reports are recorded in the Quarterly Aquatic Animal Disease Database. This information is used to support the issuing of health certificates for domestic and international trade, and to produce reports on Australia's animal health status for OIE.

Collaboration with industry strengthens government animal health services and contributes to high-quality policy decisions. It also leads to joint government–industry activities to support awareness and improvement of biosecurity and welfare. AHA also trains livestock industry staff to work in EAD responses, promoting further government–industry partnership.

Protecting human health from diseases and pests of animals is a key role of state and territory animal health personnel. They work closely with government public health counterparts in a joint approach to zoonoses such as salmonellosis, chlamydia, melioidosis and infections with avian influenza, Hendra virus and Australian bat lyssavirus.

1.5 Australian Government animal health services

Under the Australian Constitution, the Australian Government is responsible for quarantine and international animal health matters, including disease reporting, export certification and trade negotiation. It also provides national coordination of EAD response activities, and coordinates and provides advice on national policy on animal health and welfare. In some circumstances, it provides financial assistance for national animal disease control programs. The Australian Government Department of Agriculture, Water and the Environment administers all these activities in animal health and welfare. It works to deliver effective, risk-based services across the biosecurity continuum, whether onshore, at the border or offshore.

The following areas⁸ in the Department of Agriculture, Water and the Environment⁹ are responsible for animal health and veterinary public health:

- Office of the Australian CVO¹⁰
- Biosecurity Animal Division
 - Animal Biosecurity Branch
 - Animal Health Policy Branch
 - Animal and Biological Imports Branch
- Export Reform and Live Animal Exports Division
 - Animal Welfare Branch
 - Live Animal Export Branch
- Exports and Veterinary Services Division
 - Export Standards Branch
 - Meat Exports Branch
 - Residues and Food Branch
 - Veterinary and Export Meat Branch
- Biosecurity Operations Division
 - Science and Surveillance Group
 - Post Entry Quarantine Group
- Agricultural Policy Division
 - Innovation and Consumers Branch

This structure reflects a national approach to biosecurity and welfare, and aims to simplify domestic and international communications and improve responsiveness.

Border controls

Entry of animals and animal products into Australia is administered by the Department of Agriculture, Water and the Environment under the *Biosecurity Act 2015* (Cwlth), to protect the ongoing health and viability of Australia's livestock, wildlife, agriculture and other enterprises.

Importation of animals and animal products into Australia is regulated by the Department of Agriculture, Water and the Environment under the *Biosecurity Act* and its subordinate legislation, and

⁸ www.awe.gov.au/about/who-we-are/structure

⁹ www.directory.gov.au/portfolios/agriculture-water-and-environment/department-agriculture-water-and-environment

¹⁰ www.agriculture.gov.au/animal/health/acvo

by the Australian Government Department of the Environment and Energy under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) and its subordinate legislation.

The Department of Agriculture, Water and the Environment undertakes a range of risk analyses in response to market access requests from other countries or proposals from Australian importers to import new animals, plants and/or other goods into Australia. These analyses may be regulated under the Biosecurity Act, or may be undertaken as a risk review by the Department of Agriculture, Water and the Environment.

Biosecurity Import Risk Analyses (BIRAs) are legislated in the Biosecurity Act and subordinate legislation. BIRAs are undertaken by the Department of Agriculture, Water and the Environment to assess the level of biosecurity risk that may be associated with the importation of a good, and to identify appropriate ways to manage those risks to achieve the appropriate level of protection (ALOP) for Australia. Australia's ALOP is expressed as providing a high level of Sanitary and Phytosanitary (SPS) protection aimed at reducing risk to a very low level, but not to zero.

The term 'biosecurity risk' refers to the likelihood of a disease or pest entering, establishing or spreading in Australian territory, and the potential for the disease or pest to cause harm to human, animal or plant health, the environment, or economic or community activities. BIRAs are consistent with Australian Government policy, the obligations of the World Trade Organisation SPS Agreement, and the standards developed by OIE and the International Plant Protection Convention. The Biosecurity Import Risk Analysis Guidelines 2016 provide further information on how the risk-analysis process is conducted, and is available on the Department of Agriculture, Water and the Environment website.¹¹

The Department of Agriculture, Water and the Environment also regulates the import of biological goods, live animals and reproductive material into Australian territory under the Biosecurity Act. Biological goods that may be imported include products derived from animals and microbes, such as food, human and animal therapeutics, laboratory

¹¹ www.agriculture.gov.au/biosecurity/risk-analysis/guidelines

materials, animal feed and veterinary vaccines. Import conditions are available on the BICON database.¹²

The Department of Agriculture, Water and the Environment works across the biosecurity continuum to manage biosecurity risks from imported live animals and biological goods by:

- developing import conditions to mitigate the biosecurity risks to an acceptable level, and auditing overseas facilities to verify the integrity of:
 - manufacturers' systems for sourcing raw materials, processing, preventing contamination and tracing products, or
 - arrangements for preparing and quarantining live animals prior to export;
- assessing information provided with import applications to decide whether the biosecurity risk can be reduced to an acceptable level through:
 - manufacturing processes, or
 - testing and treatment regimens, or
 - restrictions on what the goods may be used for after import;
- liaising with international competent authorities; and
- granting import permits, if relevant conditions can be met.

Import permits may be suspended, revoked or amended if biosecurity risks change, for example if there is an exotic disease outbreak in a country from which goods are sourced, processed and/or approved for export to Australia.

Office of the Australian Chief Veterinary Officer

The Australian CVO is the primary representative of and adviser to the Australian Government on matters relating to the maintenance and improvement of Australia's animal health status and its supporting systems. The Australian CVO provides leadership and strategic direction on policy issues relating to animal health in Australia, as well

¹² bicon.agriculture.gov.au/BiconWeb4.0

as being Australia's international reference point for animal health and welfare. In 2018, the Australian CVO was elected as President, OIE World Assembly, and will retain this position through to the end of May 2021.

The Office of the Australian CVO assists the Australian CVO in delivering three priorities:

- providing strategic analysis of, influencing and championing Australia's collective animal health systems and services;
- providing international representation of Australia's animal health status and systems and influencing international policy and standards; and
- delivering outcomes on AMR.

1.6 Other national animal health bodies and programs

Animal health laboratories

Animal health laboratories play an integral part in Australia's animal health system. A network of world-class animal health laboratories is operated by the Australian Government, state and territory governments, veterinary schools and the private sector. This network provides surveillance, diagnostic and research services for endemic and exotic animal diseases, including transboundary animal diseases and zoonoses. Some government, university and private laboratories also participate in specific national disease management programs (e.g. anthrax, arboviruses) or service business needs on an ad hoc basis. Further information about animal health laboratories is provided in Chapter 5.

Veterinary statutory bodies

Each Australian state and territory has its own veterinary statutory body (VSB). The core purposes of VSBs are ensuring minimum standards of veterinary care and safeguarding public confidence in the profession.

As defined by OIE, the key activities of VSBs include regulating veterinarians (and paraprofessionals) through licensing, determining the minimum standards of education that entitle registration, and

defining the standards for professional conduct of veterinarians. State and territory legislation registers veterinarians, evaluates domestic and foreign veterinary qualifications to determine acceptability for registration, licenses veterinary hospitals, defines those classes of therapeutic agents and invasive procedures that are restricted to veterinarians, investigates complaints, applies disciplinary procedures, sets standards for continuous professional development, and assesses and registers veterinarians as specialists.

Veterinary and agricultural education

Australia has seven veterinary schools: Charles Sturt University; James Cook University; Murdoch University; the University of Adelaide; the University of Melbourne; the University of Queensland and the University of Sydney. All Australian veterinary courses include strong programs in the health of horses, companion animals, farmed livestock and wildlife, as well as in animal welfare, biosecurity and public health. The veterinary schools also provide research, continuing education and postgraduate training relevant to Australia's livestock industries.

Once every seven years, the Veterinary Schools Accreditation Advisory Committee (VSAAC) visits each established Australian veterinary school to audit the school against 12 standards, including curriculum, facilities, staffing and outcomes. Since 1999, the Australasian Veterinary Boards Council (AVBC)¹³ has provided oversight of VSAAC audits.

As well as being responsible for accreditation, AVBC advises on standards for veterinary registration in Australia and New Zealand, and on registration of veterinary specialists. It also assesses the skills of veterinarians who wish to migrate to Australia, and administers the National Veterinary Examination to recognise the skills of overseas-qualified veterinarians.

Universities, agricultural colleges and other registered training organisations in the Australian vocational education and training sector provide training for veterinary nurses, animal technologists, farm managers and others involved in caring for animals. Students can participate in full-time

¹³ avbc.asn.au

training, mix part-time training with work, or begin their program while they are still at school. One of the hallmarks of the system is active involvement of industry groups and employers in providing training opportunities and work experience. This training meets the requirements of national competency standards and vocational qualifications in the Australian Qualifications Framework. The standards are agreed to by industry, professional organisations and each jurisdiction.

Private veterinary services

Private veterinary practitioners play a vital role in communities by (among other activities) providing livestock owners with animal health, welfare and production advice, and by investigating and treating disease. They also work with companion animals and wildlife and play an important public health role in managing and providing advice about potential zoonotic diseases. They have an integral role in programs for detecting and responding to significant animal disease incidents in Australia.

Under state or territory legislation, veterinary practitioners must be registered to practise veterinary science. Competence in recognising and diagnosing livestock diseases is an important part of veterinary education in Australia and a prerequisite for registration as a veterinarian. All veterinary practitioners must be able to recognise the possibility of an EAD and be familiar with the procedures to initiate an immediate response. To maintain this awareness, state and territory

Private veterinary practitioners play a vital role in communities by (among other activities) providing livestock owners with animal health, welfare and production advice...

authorities conduct awareness programs on notifiable and exotic livestock diseases for private veterinarians, particularly those involved in livestock industries.

Many key conferences and training seminars for private veterinarians are held annually across the nation, providing continuing professional development opportunities for veterinarians. These include the Australian Veterinary Association Annual Conference, the Australian and New Zealand College of Veterinary Scientists Science Week, and a number of online and in-person training courses held by state and territory authorities and their affiliate organisations.

The national Accreditation Program for Australian Veterinarians¹⁴ is designed to integrate private veterinary practitioners into the national animal health system, to support the international standing of Australia's animal health capability. The program accredits non-government veterinarians, who can use their skills and knowledge effectively to contribute to government and industry animal disease control programs and export inspection and certification.

Research and Development Corporations

There are 15 Rural Research and Development Corporations (RDCs) in Australia, including six plant-based, eight animal-based and one cross-sectoral organisation (AgriFutures). RDCs drive industry improvements through making strategic investments in priority research, development and extension with a mixture of farmer levies and Australian Government funding. A summary of these RDCs is located in Appendix A to this report.

¹⁴ www.animalhealthaustralia.com.au/training/veterinary-training/accreditation-program-for-australian-veterinarians-apav

2

Terrestrial animal health



2.1 Status of terrestrial animal health in Australia

Australia provides the World Organisation for Animal Health (OIE) with routine information about OIE-listed diseases through reports every six months. Australia's terrestrial animal health status is publicly accessible via OIE's website.^{15,16}

The National List of Notifiable Animal Diseases of Terrestrial Animals¹⁷ facilitates disease reporting and control by identifying those diseases that must be reported to an agricultural authority. The list, agreed to by the Animal Health Committee (AHC), includes all diseases notifiable to OIE and endemic diseases of national significance. The requirement to report occurrences of listed diseases to government authorities is contained in state and territory legislation.

States and territories also have their own lists of notifiable diseases, which contain all diseases on the national list as well as others that are of particular interest to an individual state or territory. Producers and veterinarians are also encouraged to report any unusual incidents involving animal mortality or sickness to ensure that any diseases of terrestrial or public health significance are investigated.

The National Priority Terrestrial Animal Diseases List was completed and agreed to by AHC and the National Biosecurity Committee (NBC) in 2020. An accompanying national terrestrial animal health strategy (similar to AQUAPLAN) is being drafted in consultation with stakeholders and will be known as AnimalPLAN. An interim list for priority exotic environmental pests and diseases¹⁸ is also available online.

¹⁵ www.oie.int/en/animal-health-in-the-world/official-disease-status

¹⁶ <https://wahis.oie.int/#/home>

¹⁷ www.agriculture.gov.au/pests-diseases-weeds/animal/notifiable

¹⁸ www.agriculture.gov.au/biosecurity/environmental/priority-list

National reporting system for animal diseases in Australia

Australia's disease surveillance includes targeted and general activities delivered under the authority of the Australian Government and state and territory governments (jurisdictions).

Each jurisdiction is required to comply with legislated obligations to detect the occurrence and prevalence of notifiable diseases. Data on disease investigations are held in jurisdictional field and laboratory databases, enabling disease control programs to be informed by property, regional and jurisdictional intelligence on diseases.

Under the National Animal Health Information Program (NAHIP), a subset of jurisdiction-held disease investigation data is collated nationally in Australia's National Animal Health Information System (NAHIS) database. This national dataset of important surveillance information informs the Australian Government Department of Agriculture, Water and the Environment in its reporting to OIE, and is also reported in the *Animal Health Surveillance Quarterly*¹⁹ and the *AHiA Annual Report*. For more information about NAHIP and NAHIS, visit the Animal Health Australia website.²⁰

2.2 Surveillance programs

Australia undertakes both targeted and general surveillance for terrestrial animal diseases. It also delivers surveillance programs specific to northern Australia as well as public health surveillance for zoonotic diseases.

These surveillance activities are performed to:

- identify exotic, emerging and nationally significant endemic animal diseases;
- provide necessary information for disease control policies, programs and reporting requirements;
- support access to Australia's export markets for animals and animal products; and
- maintain productivity and profitability of livestock industries.

¹⁹ www.animalhealthaustralia.com.au/our-publications/animal-health-surveillance-quarterly

²⁰ www.animalhealthaustralia.com.au/what-we-do/disease-surveillance/national-animal-health-information-system-nahip

Steps would include:



Each jurisdiction is required to comply with legislated obligations to detect occurrence and prevalence of notifiable diseases.



Data on disease investigations are held in jurisdictional field and laboratory databases.



This enables disease control programs to be informed by property, regional and jurisdictional intelligence on diseases.

For more information about nationally agreed surveillance objectives and priorities, refer to the *National Animal Health Surveillance Business Plan 2016–2020* on the Department of Agriculture, Water and the Environment website.²¹

Individual state and territory governments are responsible for terrestrial animal health surveillance and monitoring within their

²¹ www.agriculture.gov.au/sites/default/files/sitecollectiondocuments/animal/nahsd-business-plan.pdf

boundaries. However, national coordination is achieved through the above surveillance business plan, NAHIP and the coordinating mechanisms described in Chapter 1 of this report.

In all jurisdictions, official government veterinarians establish relationships with private veterinarians and maintain networks of animal health surveillance stakeholders. This facilitates collaboration during investigations of unusual disease incidents and ensures exchange of important surveillance information.

A nationally consistent framework for subsidising disease investigations, laboratory expenses and training for private veterinarians is supported under the National Significant Disease Investigation Program (NSDIP).

National targeted surveillance programs

National Arbovirus Monitoring Program

The National Arbovirus Monitoring Program (NAMP) monitors the Australian distribution of economically important arboviruses (insect-borne viruses) of livestock (cattle, sheep, goats and camelids), and their associated insect vectors.

Arboviruses monitored by NAMP include bluetongue, Akabane and bovine ephemeral fever viruses. Bluetongue virus (BTV) infection does not adversely affect production in Australian livestock. NAMP supports Australian Government export certification that Australian ruminants are sourced from areas free from transmission of these specified arboviruses.

NAMP data are gathered throughout Australia by serological monitoring of cattle in sentinel herds, strategic serological surveys of other cattle herds (serosurveys), and trapping of insect vectors. The number and locations of herds are selected to establish that the zone is free from BTV transmission. Areas that are known to be endemically infected are sampled to detect any new strains of BTV.

AHA publishes yearly NAMP reports on its website²² and also maintains an online interactive Bluetongue

Virus Zone Map,²³ which defines the zone where no BTV transmission has been detected in the past two years.

National Avian Influenza Wild Bird Surveillance Program

The National Avian Influenza Wild Bird (NAIWB) Surveillance Program is coordinated by Wildlife Health Australia (WHA) with in-kind support from jurisdictional agencies, researchers and representative institutions. The program is comprised of two sampling components: targeted surveillance via sampling of apparently healthy and hunter-shot wild birds; and general surveillance via investigation of significant unexplained morbidity and mortality events in wild birds.

NAIWB Surveillance Program continues to provide valuable ecological and epidemiological background information that assists strategic risk management to minimise the potential effects of avian influenza (AI) viruses – particularly highly pathogenic AI – on human health, poultry industries and wildlife in Australia. A subset of samples is also tested for avian orthoavulavirus1 (AOAV-1; also known as Newcastle disease virus or APMV-1). The multi-agency and cross-jurisdictional approach also provides a forum for collaboration on technical aspects of influenza in humans, animals and wildlife.

Importantly, regular sampling and detection of AI viruses (AIVs) and AOAV-1 in Australian wild birds:

- maintains and contributes to enhancing Australia's capacity to rapidly and reliably test for AIV and avian paramyxovirus serotype-1 (APMV-1) in Australian poultry and wild birds;
- provides the principal source of AIV and APMV-1 sequence data necessary to monitor the ongoing evolution of Australian-specific lineages;
- allows regular evaluation of primer target sequence variability to ensure 'fit-for-purpose' diagnostic tests are available to detect these viruses in poultry; and
- serve as a point of comparison when novel AIV strains of importance emerge overseas.

22 www.animalhealthaustralia.com.au/what-we-do/disease-surveillance/national-arbovirus-monitoring-program

23 namp.animalhealthaustralia.com.au/public.php?page=pub_home&program=2

See WHA's National Avian Influenza Wild Bird Surveillance webpage, *Avian Influenza in Wild Birds* fact sheet and *Wild Bird Newsletter* for more information.²⁴

Transmissible Spongiform Encephalopathies Freedom Assurance Project

In 2020, Australia maintained freedom from classical scrapie and continued to be recognised by OIE as a country of negligible risk for bovine spongiform encephalopathy (BSE). These diseases are types of transmissible spongiform encephalopathies (TSEs). TSE Freedom Assurance Project (TSEFAP), which is funded by nine industry stakeholders, state and territory governments as well as the Australian Government, aims to increase market confidence that Australian animals and animal products are free from TSEs. This is achieved through the structured and nationally integrated management of animal-related TSE activities by AHA.²⁵

Projects that operate under TSEFAP are:

- National Transmissible Spongiform Encephalopathies Surveillance Project (NTSESP);
- the Australian ruminant feed-ban scheme, including inspections and testing;
- imported animal surveillance for cattle imported from countries that subsequently reported BSE; and
- communications.

NTSESP demonstrates Australia's ability to meet the requirements for BSE-negligible-risk and classical-scrapie-free status and to provide early detection of these diseases should they occur. Samples are collected from 'clinically consistent',²⁶ 'fallen'²⁷ and 'casualty slaughter'²⁸ cattle. Australia implements

OIE type B surveillance, which is designed to detect at least one BSE case per 50 000 in the adult cattle population at a confidence level of 95%. Surveillance points are assigned to cattle samples according to the likelihood of detection of BSE, based on the animal's age and subpopulation category. Australia requires 150 000 points over a seven-year rolling period to maintain the 95% confidence level.

For sheep, NTSESP is a targeted surveillance program using brains collected from animals showing clinical signs consistent with scrapie, which are then tested by laboratory examination. Since 2002, feeding of ruminants with any meals derived from vertebrates (including fish and birds) has been banned. The ban is enforced under legislation in each state and territory, and by a uniform approach to the inspection of all parts of the ruminant production chain. It does not include tallow, gelatine, milk products, or animal oils and rendered fats.

National Sheep Health Monitoring Project

The National Sheep Health Monitoring Project (NSHMP) is managed by AHA and monitors lines of sheep in abattoirs for several important animal health conditions. Primary Industries and Regions South Australia has also contributed data to NSHMP via the Enhanced Abattoir Surveillance Program. Conditions monitored include arthritis, bladder worm (*Cysticercus tenuicollis*), bruising, caseous lymphadenitis, cirrhosis, dog bites, grass seed contamination, fever/septicaemia, hydatids, knotty gut, liver fluke, lungworm, nephritis, ovine Johne's disease on request by the producer, pleurisy, pneumonia, rib fractures, *Sarcocystis* spp., sheep measles (*Taenia ovis* infection) and vaccination lesions.

Data collected under NSHMP are stored in the Endemic Disease Information System, which is maintained by AHA. State sheep health coordinators have access to the state dataset and return this information to producers in the form of individual animal health status reports on the lines inspected. Information has also become available to producers through the Livestock Data Link portal, managed by Integrity System Company. Processors are provided with a daily report for their own plants.

24 www.wildlifehealthaustralia.com.au/ProgramsProjects/WildBirdSurveillance.aspx

25 www.animalhealthaustralia.com.au/what-we-do/disease-surveillance/tse-freedom-assurance-program

26 Defined as 'an animal that is found with clinical signs considered consistent with BSE', analogous with 'clinical suspect' as in OIE's 2018 *Terrestrial animal health code*, Chapter 11.4, on surveillance for BSE.

27 Defined in OIE's 2018 *Terrestrial animal health code*, Chapter 11.4, as 'cattle over 30 months of age which are found dead or killed on farm, during transport or at an abattoir'.

28 Defined in OIE's 2018 *Terrestrial animal health code*, Chapter 11.4, as 'cattle over 30 months of age that are non-ambulatory, recumbent, unable to rise or to walk without assistance; cattle over 30 months of age sent for emergency slaughter or condemned at ante-mortem inspection'.

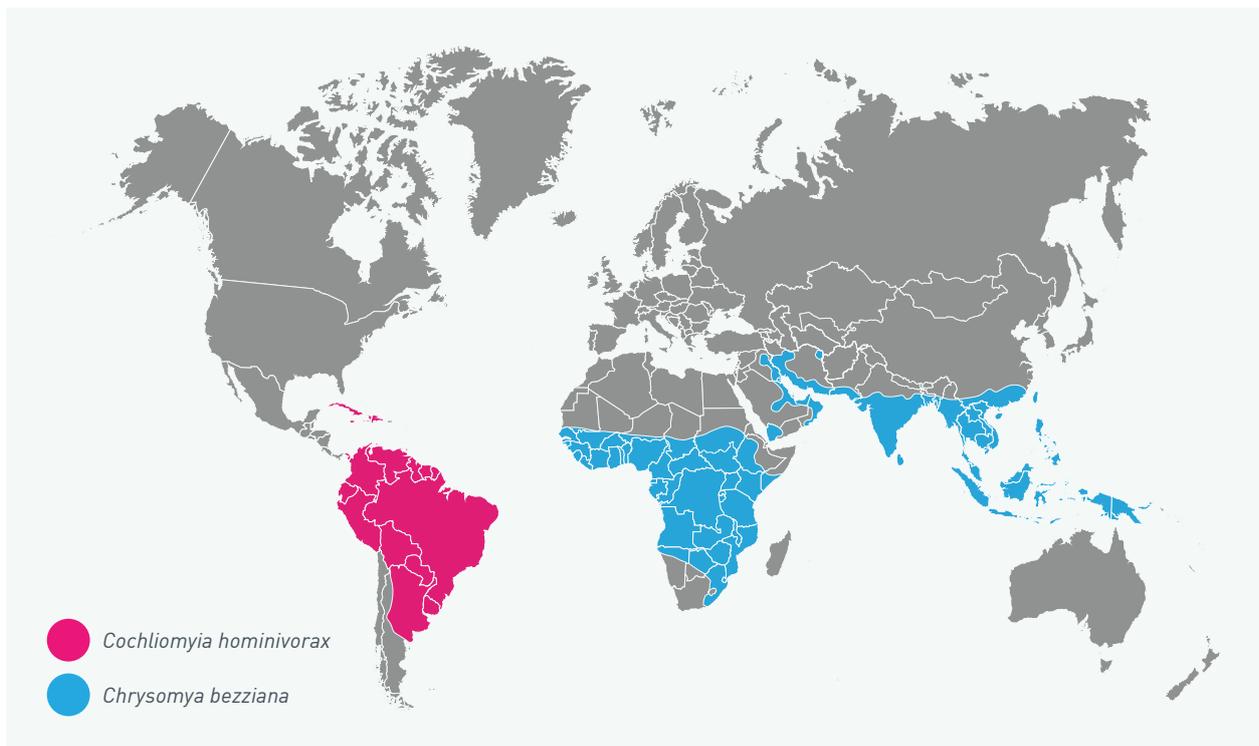


Figure 2.1 Global distribution of Old World screw-worm fly (*Chrysomya bezziana*) and New World screw-worm fly (*Cochliomyia hominivorax*)

Monitoring of livestock in abattoirs enables public health risk management of diseases such as hydatid disease. It also provides an opportunity to collect surveillance data, which can be used to inform domestic animal health management decisions and to support Australia's freedom from specified diseases. NSHMP has generated a comprehensive, contemporary dataset that provides a good indication of the animal health status of the Australian flock.

Screw-worm Fly Surveillance and Preparedness Program

Old World screw-worm fly (OWS) (*Chrysomya bezziana*) and New World screw-worm fly (NWS) (*Cochliomyia hominivorax*) are exotic to Australia, and suspicion of infestation in animals is notifiable under state and territory animal health legislation.²⁹ Screw-worm fly (SWF) infestation in humans is not notifiable.³⁰

OWS and NWS have similar biological profiles and fill similar ecological niches in Africa and Asia (OWS) and the Americas (NWS).³¹ OWS myiasis

(infestation with fly larva) is a significant production disease of livestock throughout its range. OWS is considered a greater threat to Australian livestock industries than NWS because of Australia's proximity to areas in which OWS occurs and the return to Australian ports of livestock export vessels from Asia and the Middle East, where OWS is prevalent (see Figure 2.1).

Although surveillance indicates a low likelihood of incursion of SWF into Australia, the potential for establishment and spread across several states and territories is significant. SWFs lay their eggs in the wounds of any living warm-blooded animal, and the Australian tropical climate is favourable to their life cycle. Modelling has indicated that most of tropical northern Australia and part of the eastern seaboard offer a suitable climate for OWS survival; in the south of Australia, extremes of temperature and moisture would limit survival.

Feral animals, livestock and wildlife would be important hosts for SWF in Australia. The large feral animal populations in the north and the large numbers of both extensively and intensively reared livestock along the eastern seaboard mean that SWF could spread widely if it entered and became established in Australia.

29 www.agriculture.gov.au/pests-diseases-weeds/animal/notifiable

30 www.health.gov.au/casedefinitions

31 Spradbery P. Screw-worm fly: a tale of two species. *Agricultural Zoology Reviews* 1994; 6: 1–62.

AHA manages the Screw Worm Fly Surveillance and Preparedness Program³² in consultation with a committee of industry and government stakeholders. The program aims to detect an incursion early enough to ensure high likelihood of success of an eradication program.

National Bee Pest Surveillance Program

Australia is free from many serious bee pests and pest bees that have contributed to decreasing bee populations overseas. Declining bee populations can adversely impact the production of honey, bee products, and the delivery of pollination services.

The National Bee Pest Surveillance Program is an early warning system to detect new incursions of a wide range of pests and diseases of honey bees.³³ In addition, the program provides technical, evidence-based information to support pest-free status during export negotiations and to assist exporters in meeting export certification requirements. The program conducts surveillance using a range of methods at ports throughout Australia considered to be the most likely entry points for bee pests and pest bees. Plant Health Australia (PHA) has been coordinating state and territory government bee surveillance activities at seaports and airports nationwide since 2012.

National general surveillance

National Significant Disease Investigation Program

NSDIP was initiated in June 2009 to facilitate investigation of significant disease events by private veterinarians. Significant disease events are defined as those that are clinically consistent with national notifiable animal diseases and are showing an increasing incidence and/or expanding geographical or host range but are not suspected to be an emergency animal disease (EAD).³⁴ Where there is genuine suspicion of an EAD, the disease event is considered to be outside the scope of NSDIP funding, and the relevant state or territory government department will lead and fund an investigation.

32 www.animalhealthaustralia.com.au/what-we-do/disease-surveillance/screw-worm-fly

33 www.planthealthaustralia.com.au/national-programs/national-bee-pest-surveillance-program

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

NSDIP is managed by AHA and delivered by state and territory governments and WHA. It is funded from livestock industry and government member subscriptions to AHA. The program aims to boost Australia's capacity for early detection of national notifiable animal diseases and new or emerging diseases in livestock and wildlife by increasing the participation of private veterinarians in disease investigations. By promoting effective collaboration between non-government veterinary practitioners and governments, the program improves the quality (e.g. of sample submissions) and increases the quantity of significant disease events investigated.

Registered private veterinarians engaged in clinical veterinary medicine, including veterinary practitioners in university clinics, zoos and wildlife parks, are eligible to participate in NSDIP. Disease investigation subsidies are available for field work (e.g. clinical evaluation, necropsy and collection of diagnostic samples), laboratory diagnostic work, and follow-up field investigation (if required).

From July 2016, the scope of NSDIP activities was expanded to include training of private veterinarians in disease investigation, and to increase levels of knowledge, skill and confidence to investigate and report on disease events.

Other support for disease surveillance by private veterinarians

State and territory government departments also support private veterinarians to undertake disease investigation and training. Details about these activities can be found on state and territory government department websites.³⁵

Wildlife health surveillance

WHA administers Australia's general wildlife health surveillance system in partnership with government and non-government agencies. WHA continues to support the wildlife component of the *National Animal Health Surveillance Business Plan 2016–2020* and also Australia's international reporting obligations. As well, WHA focuses on enhancing Australia's capability to prevent, detect and respond to environmental biosecurity concerns, including priority wildlife diseases identified in

35 See for instance <https://agriculture.vic.gov.au/biosecurity/animal-diseases/vetsource/animal-disease-investigation-training> and <https://www.agric.wa.gov.au/livestock-biosecurity/sampling-and-post-mortem-resources-veterinarians>.

Wildlife disease surveillance numbers

18

years of operation

300

species reported

12,000

cases in eWHIS

50,000

free-ranging
wildlife cases
assessed per year

120

stakeholder
organisations in
the broader wildlife
health network

48

contributing
surveillance
partner agencies and
organisations

Wildlife disease surveillance partners — zoos, sentinel clinics and universities

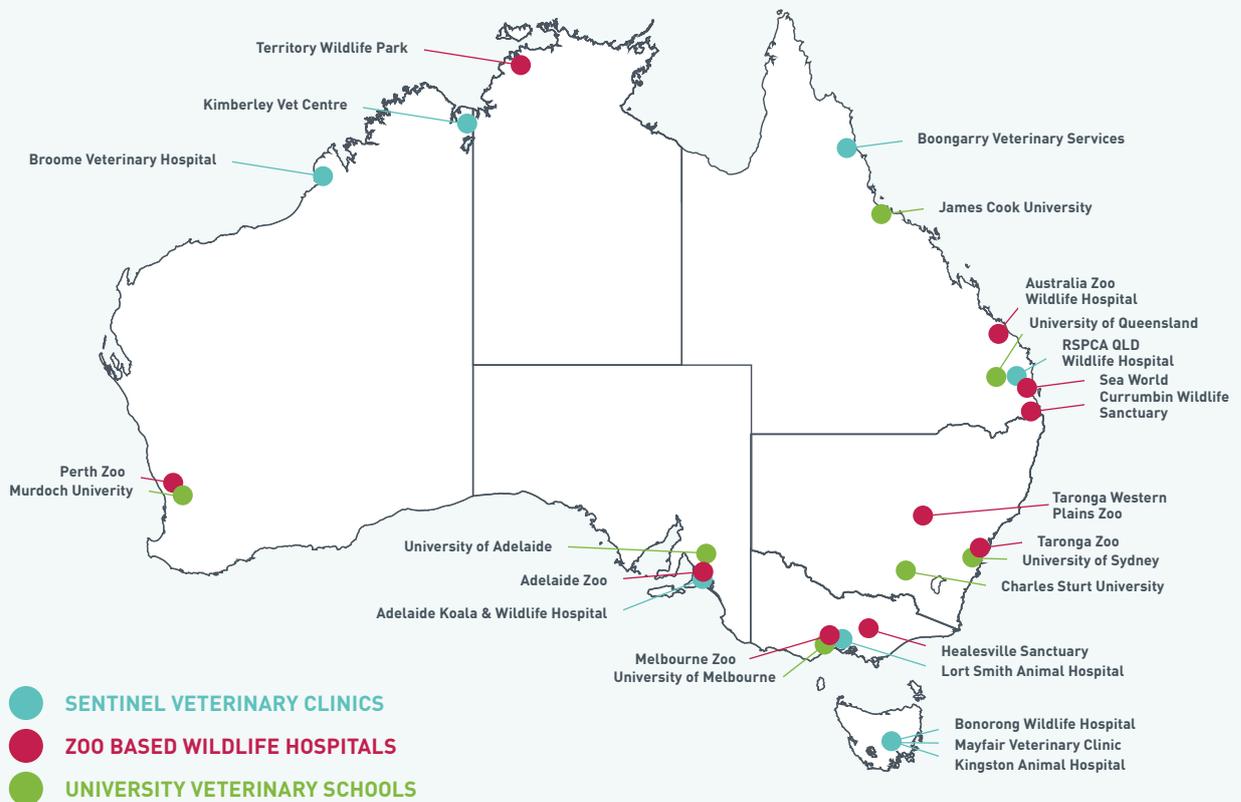


Figure 2.2 Wildlife disease surveillance in Australia

the National Priority List of Exotic Environmental Pests and Diseases.³⁶ WHA has also published its *National Wildlife Biosecurity Guidelines* for audiences such as wildlife carers, wildlife managers and field researchers.³⁷ These guidelines document best-practice biosecurity measures for those working with Australian wildlife, to assist them in assessing and managing biosecurity risks associated with interacting with wildlife.

National coordination of wildlife disease surveillance

Key elements of the national wildlife disease surveillance system include a network of coordinators reporting into a web-enabled national database (eWHIS) that captures wildlife health information. This network includes WHA coordinators (agriculture) and environmental representatives in each jurisdiction, coordinators at zoo wildlife hospitals, sentinel veterinary clinics, universities, the Australian Registry of Wildlife Health, the Northern Australia Quarantine Strategy and the Australian Centre for Disease Preparedness (ACDP, formerly Australian Animal Health Laboratory [AAHL]).

General wildlife health surveillance system reporting focuses on the following categories: nationally notifiable animal diseases; diseases listed by OIE; biodiversity diseases; public health and zoonotic diseases; poisoning events; mass or unusual mortality events; and diseases considered unusual, interesting or emerging. Disease events are reported by 48 WHA partner organisations that form the surveillance network, in addition to reports from private practitioners, wildlife rehabilitators and members of the public.

Surveillance in northern Australia

Australia is free from many agricultural pests and diseases that affect the quality and production of food and fibre. Although Australia is geographically isolated with an effective biosecurity system, the remote and sparsely populated northern coastline is vulnerable to the introduction and establishment of exotic agricultural pests and diseases from neighbouring countries. Established seaports and airports are controlled in accordance with relevant risk profiles,

however the northern coastline is exposed to wind and ocean currents, potentially unregulated or illegal vessel movements, busy shipping channels, marine debris and migratory animals.

Northern Australia Quarantine Strategy

The Northern Australia Quarantine Strategy (NAQS), within the Australian Government Department of Agriculture, Water and the Environment, was established in 1989 to provide an integrated approach toward the complex and unique biosecurity risk profile of northern Australia. The program covers northern aspects of the Northern Territory, Queensland, the Torres Strait and Western Australia. It does not include southern jurisdictions. The objectives of NAQS Animal Health include gathering intelligence on unregulated risk pathways, conducting risk assessments, implementing risk-based measures for relevant diseases, and engaging with stakeholders, particularly Aboriginal and Torres Strait Islander communities.

Targeted animal health surveys

Wild and domestic animal health surveys are conducted routinely across northern Australia and the Torres Strait to detect changes in the health status of target host populations. In addition to testing for specific diseases and providing observations of large groups of animals, these surveys have the added benefit of engaging relevant stakeholders and spreading biosecurity awareness. Data are reported through NAHIS, and contribute to Australia's capacity to demonstrate the absence of pests and diseases of significance to trading partners.

Japanese encephalitis surveillance

Monitoring for Japanese encephalitis virus (JEV) in mosquitoes occurs through a collaboration between NAQS and Queensland Health during the monsoonal season, covering 13 sites throughout Queensland (the majority being in the north). NAQS also conducts JEV tests on sentinel cattle, and also on pigs, cattle and horses in routine feral and domestic animal health surveys. Detection of JEV has not been confirmed in mainland Australia since 2004, but routine surveillance activities report occasional serological evidence of JEV seasonally through the Torres Strait and Northern Peninsula

³⁶ www.agriculture.gov.au/biosecurity/environmental/priority-list

³⁷ www.wildlifehealthaustralia.com.au/Portals/0/Documents/ProgramProjects/National_Wildlife_Biosecurity_Guidelines.PDF

Dr Guy Weerasinghe

Veterinary Policy Officer | Animal Health Surveillance | Northern Australia Quarantine Strategy (NAQS)

Dr Guy Weerasinghe has been with the Northern Australia Quarantine Strategy (NAQS) for the past two years, after working in veterinary practice as well as in field surveillance roles with Biosecurity Queensland and Local Land Services NSW.

With a 31-year history along Australia's northern frontline, NAQS has been at the forefront of scientific monitoring for exotic pests and diseases through its highly trained and dedicated multidisciplinary team, the latter comprised of veterinarians, botanists, plant pathologists, entomologists, molecular biologists, community liaison officers and biosecurity officers. NAQS also works closely and collaboratively with a number of stakeholders including Aboriginal and Torres Strait Islander rangers, the northern jurisdictions (Queensland, Northern Territory and Western Australia), and a wide range of industry stakeholders.

As a veterinary officer working for NAQS, Guy's role crosses over a number of areas to support targeted and general science-based animal health surveillance projects across Australia's northern coastline. For example, Guy may be involved in assisting other NAQS veterinary and animal health officers in the field, collecting samples to support the surveillance objectives that feed into various animal health systems. The outcome of this work supports Australia's trade and market access objectives by providing evidence of animal disease absence.

Risk analysis of exotic disease threats to northern Australia is a component of Guy's work – utilising the expertise within NAQS Animal Health and experts and specialists within the broader Australian animal health system – to assess risks that may be present and to identify pathways for disease introduction, especially through unregulated



NAQS has been at the forefront of scientific monitoring for exotic pests and diseases through its highly trained and dedicated multidisciplinary team...

pathways such as migrating animals, windborne vectors, wash-up of marine debris and vessel movements.

NAQS Animal Health also conducts general surveillance through an extensive veterinary and indigenous ranger network across northern Australia. A rewarding component of Guy's work is to improve the reporting capability of rangers through improved awareness of exotic pests and diseases that NAQS monitors for, such as African swine fever, rabies and screw-worm fly.

Area, although no virus has been detected and no clinical signs of disease reported. These results are often attributed to cross reactions with other flaviviruses.

Northern Australia Biosecurity Surveillance network

The Northern Australia Biosecurity Surveillance network (NABSnet) is a key activity under the Northern Australia Biosecurity Surveillance (NABS) project. The project was initiated through the Australian Government Agricultural Competitiveness White Paper in 2016.³⁸ NABSnet aims to enhance the national animal health surveillance system, increase information sharing and collaboration in extensive cattle production areas in northern Australia and improve significant disease investigations in northern Australia. NABSnet holds annual masterclasses to provide training in such areas as sampling for African swine fever. NABSnet vets also have access to an experienced veterinary advisor to support them in investigating livestock events.

Indigenous ranger groups

A network of 69 Aboriginal and Torres Strait Islander ranger groups across northern Australia conduct fee-for-service biosecurity tasks, providing invaluable coverage and knowledge of vast tracts of remote land that would otherwise be impossible to survey or gather biosecurity risk information on.

2.3 Jurisdictional industry–government collaborative control programs

Disease control programs vary in each state and territory depending on climate and the types of livestock production systems present, both of which strongly influence disease prevalence. A range of jurisdictional industry-government collaborative control programs are in place.

Ovine brucellosis

Ovine brucellosis, caused by *Brucella ovis*, is not a nationally notifiable animal disease, but is notifiable

³⁸ <https://nabsnet.com.au>

in Tasmania and Victoria. This disease is endemic in commercial sheep flocks in some states, but its prevalence is low. Voluntary accreditation schemes (primarily for stud flocks) are in place in most jurisdictions. Information about state-based accreditation schemes, and a database of accredited flocks, can be found on AHA's website.³⁹

Caprine arthritis–encephalitis

Caprine arthritis–encephalitis (CAE) is a multisystemic inflammatory disease of goats caused by a caprine retrovirus. The disease is present in most countries, and has been reported in all Australian states and territories except the Northern Territory. CAE is not a nationally notifiable animal disease, but is notifiable in the state of Victoria (where producers, private veterinarians and veterinary laboratories are required to notify Agriculture Victoria within seven days of detecting or suspecting this disease).

Australia does not have any official regulatory control programs for CAE. However, some voluntary state-based accreditation programs operate in New South Wales⁴⁰ and Queensland⁴¹ based on serological testing. AHA and the Goat Industry Council of Australia have developed *Guidelines for the Voluntary Control and Eradication of CAE from Individual Herds* for the use of veterinarians, in partnership with their goat producer clients, to achieve effective CAE control.

Cattle tick and tick fever

The cattle tick, *Rhipicephalus* (formerly *Boophilus*) *microplus* or *R. australis*, was introduced to Australia in the late 19th century. The distribution of cattle tick is largely determined by climatic conditions; high humidity and ambient temperatures of at least 15–20°C are needed for egg laying and hatching.

Ticks also transmit tick fever (bovine babesiosis or anaplasmosis), caused by *Babesia bigemina*, *B. bovis* or *Anaplasma marginale*. Babesiosis and anaplasmosis are nationally notifiable animal diseases in tick-free areas.

³⁹ www.animalhealthaustralia.com.au/ovine-brucellosis

⁴⁰ www.dpi.nsw.gov.au/animals-and-livestock/goats/health/cae-accreditation-scheme

⁴¹ www.business.qld.gov.au/industries/farms-fishing-forestry/agriculture/livestock/animal-welfare/pests-diseases-disorders/caprine-arthritis-encephalitis

Dr Celia Dickason

Manager, Disease Surveillance | Primary Industries and Regions South Australia | Biosecurity SA, Animal Health

Dr Celia Dickason is Manager of Disease Surveillance. She provides leadership and management of all disease surveillance programs and policies for South Australia. Her day-to-day work is highly varied, with many different activities on the go. One day might find her in national and local policy meetings on a wide range of topics, working on disease communication campaigns – most recently on African swine fever – or working with her small team of veterinarians and animal health support staff on various aspects of each program she oversees. One such program includes linking with a large network of private veterinary practitioners in South Australia to conduct field disease investigations, which are subsidised to encourage sample submission to the state veterinary diagnostic laboratory for exotic disease exclusions. Celia works closely with the state veterinary diagnostic laboratory and regional government veterinarians to monitor active disease investigations and diagnostic test outcomes for livestock in South Australia.

One such program includes linking with a large network of private veterinary practitioners in South Australia to conduct field disease investigations...



Celia studied veterinary science at Pretoria University, South Africa, and worked in the United Kingdom and South Africa before moving to Australia in 2003 to work at Biosecurity SA. Her time in South Africa has equipped Celia with a wealth of knowledge and first-hand experience regarding many of the diseases Australia is working to maintain freedom from, including foot-and-mouth disease. In her time with Biosecurity SA, Celia has worked on many different projects, including leading the implementation of the Enhanced Abattoir Surveillance (EAS) program. EAS provides health condition and disease feedback to South Australian sheep producers through surveillance conducted at Thomas Foods International abattoirs. Data is collected on the abattoir slaughter floor by meat inspectors about the percentage of each line of sheep affected by one or more of 20 endemic diseases/conditions. Producers then receive feedback on any of their affected consignments. This further contributes to the breadth of disease surveillance in South Australia, with approximately 1.7 million sheep inspected through this program in 2019.

Acaricide treatment is widely used for tick control in endemic areas. Inspection and treatment are compulsory for cattle leaving defined tick areas in the Northern Territory, Queensland and Western Australia, and for cattle leaving known infested properties in New South Wales. The spread of ticks from endemic areas is restricted by state-managed zoning policies.

Enzootic bovine leucosis

Enzootic bovine leucosis (EBL) is a nationally notifiable animal disease with low prevalence in Australia (in sectors of the Australian beef herd). In 2008, the Australian Dairy Industry Council and animal health authorities implemented a national EBL eradication program.

Declaration of unconditional freedom from EBL in the Australian dairy herd, according to the requirements in the national *Standard Definitions and Rules for Control and Eradication of Enzootic Bovine Leucosis in Dairy Cattle* (version 2.0, February 2009), was achieved in 2013. Maintenance of the status of the Australian dairy herd requires strict ongoing controls on the introduction of beef cattle, as EBL is still present at very low prevalence in sectors of the Australian beef herd.

For more information, visit the Department of Agriculture, Water and the Environment website.⁴²

Ovine footrot

Ovine footrot, caused by *Dichelobacter nodosus* infection, causes significant economic loss in southern Australia.

Ovine footrot is not a nationally notifiable animal disease. Several states (New South Wales, South Australia and Western Australia) have eradication or control programs aimed at limiting spread of the disease.

Tasmania and Victoria do not have official control programs for footrot, although legislation is available to quarantine properties if required.

Ovine footrot is a notifiable disease in the Australian Capital Territory, New South Wales, Queensland, South Australia, Victoria and Western Australia.

⁴² www.agriculture.gov.au/pests-diseases-weeds/animal#enzootic-bovine-leucosis-eb1

Paratuberculosis

Paratuberculosis or Johne's disease (JD) is a chronic infection caused by *Mycobacterium avium* subsp. *paratuberculosis* that produces ill thrift, wasting and death in ruminants. There are two strains found in Australia with some degree of host preference, however they can infect and move between multiple species. The sheep strain is mostly seen in sheep, but is also found in cattle and goats, and the cattle strain affects cattle, goats, deer, sheep and (rarely) alpacas. JD is a nationally notifiable animal disease.

Livestock industries fund the National Johne's Disease Project⁴³ (NJDP), which aims to collaboratively reduce the effects of the disease. NJDP includes Australian JD Market Assurance Programs (MAPs) for sheep, goats and alpacas. They provide a high level of assurance that participating herds and flocks are not infected with JD. Details of herds and flocks in MAPs are maintained in NAHIS, and are available on AHA's website.

In partnership with governments, each affected livestock industry has also implemented strategies that suit its needs and disease situation.

Beef cattle

JD has rarely been detected in northern and western beef cattle. JD is also uncommon in beef herds in southeastern Australia. To help protect this situation, producers are encouraged to use a voluntary assurance system for cattle (the Johne's Beef Assurance Score). Producers are also encouraged to use a national Cattle Health Declaration to provide health information on cattle for sale and to assess the risk among cattle being purchased. JD in cattle remains a regulated disease in the Northern Territory and Western Australia, and state border controls are in place.

Dairy cattle

JD is endemic in the dairy industry in southeastern Australia. The dairy industry promotes hygienic calf rearing to help reduce the incidence of JD in replacement heifers. Buyers of dairy cattle are also encouraged to ask the seller for a written declaration of their JD Dairy Score. The JD Dairy Score was revised by Dairy Australia and a new

⁴³ www.animalhealthaustralia.com.au/what-we-do/endemic-disease/johnes-disease/national-johnes-disease-project

version released for use by producers in March 2019. It is based on a property biosecurity plan, vaccination for infected herds, and testing at higher scores.

Sheep

The management of JD in sheep now sits within the Sheep Health Project at AHA, after a major review of management of the disease in 2018. Producers are encouraged to manage JD and other diseases under their property biosecurity plan and by using the national Sheep Health Declaration (SHD). This declaration by the owner about the sheep enables buyers to assess the risk of JD and other diseases. SHD was revised and heavily promoted by AHA. A vaccination program for JD is strongly recommended in endemic areas (namely much of southeastern Australia and southern Western Australia).

Goats

The goat industry uses a risk-based trading approach for JD, employing a national Goat Health Declaration. This owner declaration includes a risk rating for JD and provides herd information on other conditions that can easily spread from herd to herd with the movement of goats. A component of the strategy is a National Kid Rearing Plan to help protect young goats from infections such as JD and CAE.

Porcine brucellosis

Porcine brucellosis is a zoonotic disease caused by *Brucella suis*. The disease is present in most countries but is rare in Australia.

B. suis infection has been detected in feral pigs in New South Wales and Queensland. The domestic pig population is at risk of infection with *B. suis* if there is contact with feral pigs or their products. Infection with *B. suis* is a nationally notifiable animal disease.

Australia does not have any official regulatory control programs for porcine brucellosis. However, the New South Wales Department of Primary Industries administers the New South Wales Porcine Brucellosis Herd Accreditation Program,⁴⁴ which provides a *B. suis* risk management option for the New South Wales pig industry.

⁴⁴ www.dpi.nsw.gov.au/animals-and-livestock/pigs/health/nsw-porcine-brucellosis-herd-accreditation-program/pbh-acc-program

Salmonella Enteritidis

Salmonella Enteritidis (SE) is a nationally notifiable animal disease of poultry that may result in depression, poor growth, weakness, diarrhoea and dehydration. SE also causes foodborne illness in people.

The New South Wales Department of Primary Industries administers the National Salmonella Enteritidis Monitoring and Accreditation Program,⁴⁵ which is available to all commercial egg producers in Australia exporting eggs to overseas markets. The program offers a staged process to enable flocks to become accredited free from SE.

Salmonella Pullorum

Pullorum disease is a nationally notifiable animal disease of poultry caused by *Salmonella* Pullorum (SP). Transmission is primarily via the egg, but SP can also be spread by direct or indirect contact (respiratory or faecal). SP mostly affects young poultry but may also be associated with disease in turkey poults, and may be carried subclinically or lead to reduced egg production and hatchability plus a range of atypical signs in older birds. Reduced egg production and hatchability may be the only signs of pullorum disease.

The Joint New South Wales/Victoria Salmonella Pullorum Monitoring & Accreditation Program⁴⁶ is available to commercial producers in New South Wales and Victoria that export day old chicks, hatching eggs and other poultry products to overseas markets. Poultry species covered by the program include chickens, ducks, geese, turkeys and quail.

2.4 Preparedness and response

In the event of an EAD incident, government officers, livestock producers, private veterinary practitioners and emergency workers are called on to help eradicate or control the disease. The Australian Veterinary Emergency Plan (AUSVETPLAN) describes how the response to an EAD incident is to

⁴⁵ www.dpi.nsw.gov.au/animals-and-livestock/poultry-and-birds/health-disease/national-salmonella-enteritidis-monitoring-and-accreditation-program

⁴⁶ www.dpi.nsw.gov.au/animals-and-livestock/poultry-and-birds/health-disease/jnswvic-spmmap

be conducted and the functions that require specific training.

Response plans and coordination

Australia's response planning and coordination is supported by collaborative arrangements between governments, industry and other key stakeholders. These arrangements include: AUSVETPLAN; nationally agreed standard operating procedures; modelling; the Emergency Animal Disease Response Agreement (EADRA); the National Biosecurity Communication and Engagement Network; the National Biosecurity Response Team; and Australia's involvement in the International Animal Health Emergency Reserve.

What happens in an emergency animal disease response?

Operational responsibility for the response to an EAD lies with the government jurisdiction(s) affected by the incident. However, a wide range of government, industry and other key stakeholders work together for successful outcomes to EAD responses.

In most jurisdictions, the government department of agriculture or primary industries manages the response to an EAD incident. Pre-existing emergency management and whole-of-government arrangements allow these departments to draw on resources and expertise from other agencies, including state emergency services, public safety services and other government departments, as needed.

The affected jurisdiction(s) develops an EAD response plan (EADRP), which outlines the objectives and overall approach for the response to the incident. The EADRP is expected to align with the disease response approach in AUSVETPLAN (as AUSVETPLAN is nationally agreed), and should consider the epidemiology and context of the incident in applying such guidance.

Australia uses consultative committees and management groups to achieve national coordination of EAD responses and support outcomes in the national interest. These committees and groups also have a role in invoking cost-sharing of the response under EADRA. Information about current emergency responses

is hosted on the national pest & disease outbreaks site.⁴⁷ Under its reporting obligations to OIE, Australia also notifies OIE of outbreaks of OIE-listed diseases.

The Consultative Committee on Emergency Animal Diseases (CCEAD) provides technical review of the EADRP and has responsibility for national technical coordination of the response. When cost-sharing for the response is sought under EADRA, CCEAD provides technical advice to a National Emergency Animal Disease Management Group (NMG) established for that incident. NMG receives technical advice and considers policy and financial issues associated with the proposed EADRP. NMG's agreement to the EADRP is an undertaking to share eligible costs under EADRA. Membership of CCEAD and NMG is shown in Figure 2.3. The specific responsibilities of CCEAD and NMG in a cost-shared EAD response are documented more fully in EADRA.⁴⁸

The Chief Veterinary Officer (CVO) of each affected jurisdiction oversees implementation of disease control measures agreed to in their EADRP, ensuring compliance with relevant legislation. To support this, the affected jurisdiction(s) will develop a range of detailed incident action plans, operating procedures and work instructions. Each jurisdiction may also establish response coordination and control centres, based on the structures outlined in the Biosecurity Incident Management System⁴⁹ and contextualised to EAD responses in AUSVETPLAN's Control Centres Management Manual.⁵⁰

CVOs make ongoing decisions on follow-up disease control measures in consultation with CCEAD and, when applicable, NMG, based on epidemiological assessment of the incident.

Stand-down of a response occurs once the response objective (e.g. disease control or eradication) has been met, when meeting the response objective is no longer considered feasible, cost-effective or beneficial, or when NMG formally declares the response over.

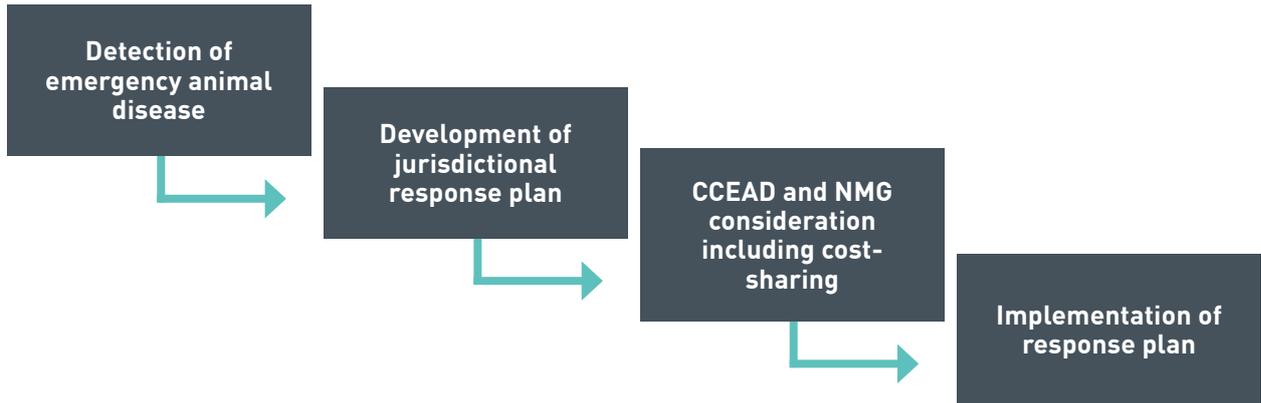
47 www.outbreak.gov.au

48 www.animalhealthaustralia.com.au/what-we-do/emergency-animal-disease/ead-response-agreement

49 www.agriculture.gov.au/biosecurity/partnerships/nbc/nbepeg/bims

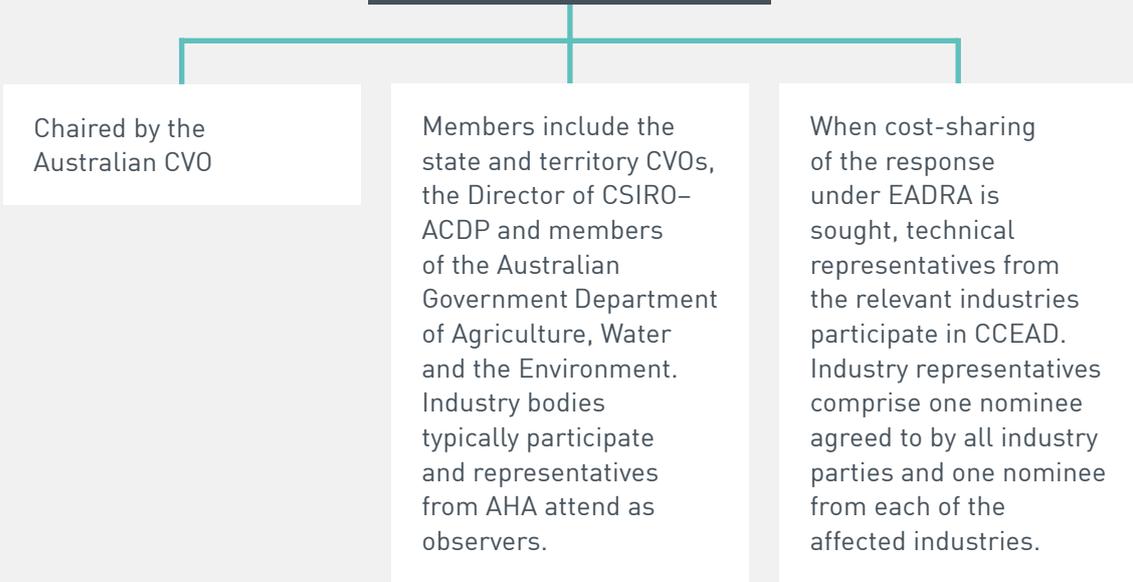
50 www.animalhealthaustralia.com.au/our-publications/ausvetplan-manuals-and-documents

Response Process



Memberships

CCEAD MEMBERSHIP



NMG MEMBERSHIP

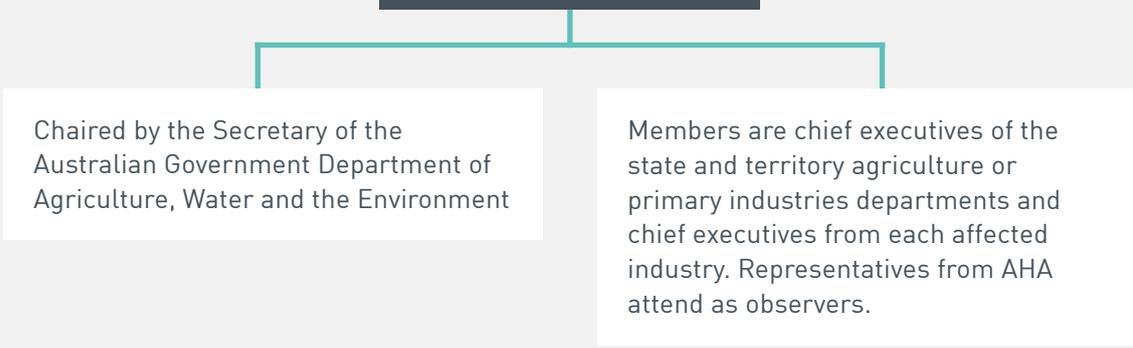


Figure 2.3 Membership of CCEAD and NMG

Australian Veterinary Emergency Plan

AUSVETPLAN comprises nationally agreed resources that guide decision-making in response to EADs. It outlines Australia's preferred approach to responding to EADs of national significance, providing flexibility to address the nature of individual incidents in the different contexts that exist across Australia.

AHA manages AUSVETPLAN on behalf of its members and supports continuous improvement to reflect changes in understanding of EADs and management of EAD responses.

Emergency Animal Disease Response Agreement

The Australian Government, state and territory governments, livestock industries (currently 14 industries) and AHA are all signatories to EADRA.⁵¹ This legal agreement (a world first) provides a mechanism for sharing eligible costs for EAD responses and allows all affected parties to have a role in the decision-making process. In this way, the agreement reduces uncertainty over management and funding arrangements for responses to EAD incidents, and so facilitates rapid and effective responses.

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

Signatories to EADRA are committed to:

- minimising the risk of EAD incursions by developing and implementing biosecurity strategies and plans for their jurisdictions or industries;
- maintaining capacity to respond to EADs by having adequate numbers of trained personnel available to perform the functions specified in AUSVETPLAN;
- participating in decision making relating to EAD responses, through representation on CCEAD and NMG; and

⁵¹ www.animalhealthaustralia.com.au/what-we-do/emergency-animal-disease/ead-response-agreement

- sharing eligible response costs of EAD incidents using pre-agreed formulas.

AHA manages EADRA on behalf of signatories and oversees the review of the agreement on an ongoing basis so it remains relevant, flexible and functional. EADRA is also formally reviewed every five years, with the next formal review scheduled for 2022. The current version of EADRA is on the AHA website.⁵²

Nationally Agreed Standard Operating Procedures

Nationally Agreed Standard Operating Procedures (NASOPs) complement AUSVETPLAN by providing guidance to response personnel undertaking operational tasks in biosecurity emergencies. NASOPs aid jurisdictions to develop local procedures and work instructions.

NBC and AHC oversee the development and maintenance of NASOPs for tasks common across biosecurity emergency responses (such as briefing and handovers) and for tasks focused on EADs (such as personal decontamination and collecting samples).

NASOPs are available on AHA's website.⁵³

National Biosecurity Communication and Engagement Network

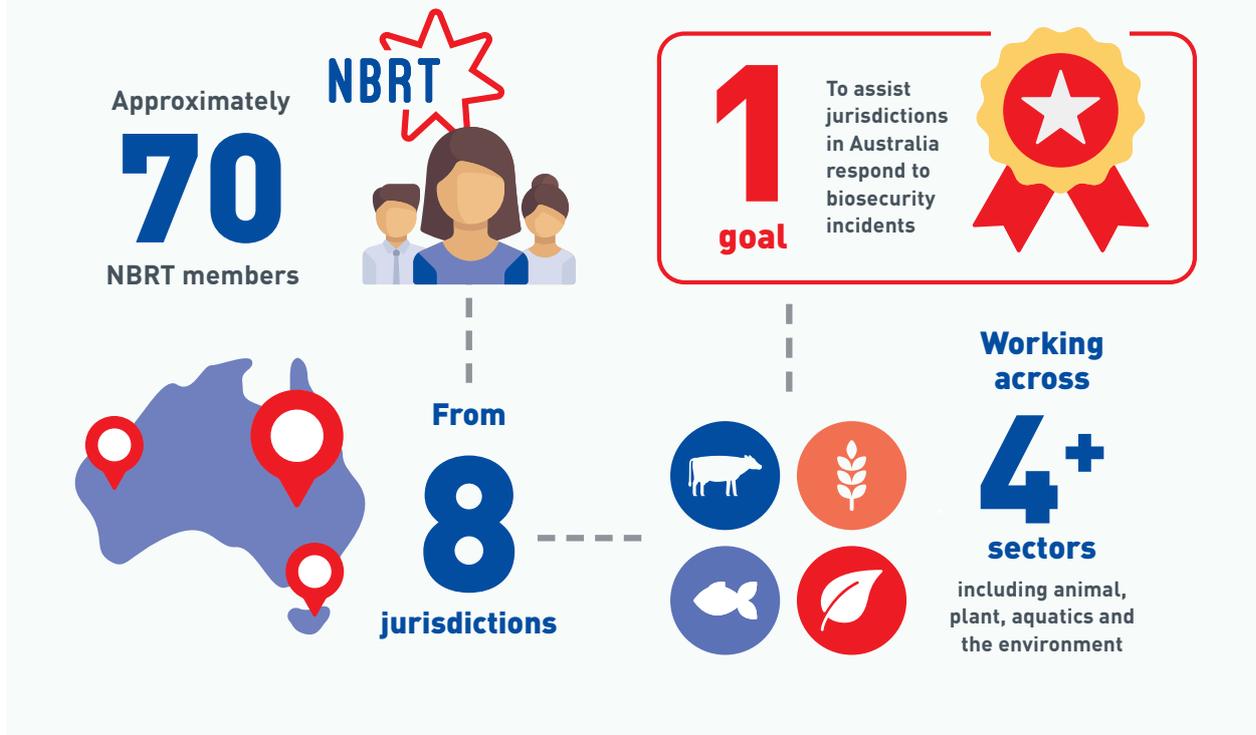
The National Biosecurity Communication and Engagement Network (NBCEN) produces nationally consistent public information in response to emergency pest and disease outbreaks that affect Australia's livestock and plant industries.⁵⁴ Members are communication managers from the Australian, state and territory government agencies responsible for biosecurity, as well as from ACDP, the Australian Government Department of Health, AHA and PHA. Observers from WHA, the Australian Local Government Association and the Centre for Invasive Species Solutions are included. NBCEN supports consultative committees and NMG during biosecurity incidents. It also coordinates communication and engagement activities

⁵² www.animalhealthaustralia.com.au/what-we-do/emergency-animal-disease/ead-response-agreement

⁵³ www.animalhealthaustralia.com.au/what-we-do/emergency-animal-disease/nationally-agreed-standard-operating-procedures

⁵⁴ www.outbreak.gov.au/about/biosecurity-incident-national-communication-network

National Biosecurity Response Team (NBRT)



that support pest and disease prevention and preparedness.

National Biosecurity Response Team

The National Biosecurity Response Team (NBRT) is a group of roughly 70 government response personnel with expertise in emergency management positions. The group can deploy in response to biosecurity incidents (animal, plant, aquatic animal or environmental), and, upon request by the lead agency of the affected jurisdiction, may also be deployed to non-biosecurity incidents (natural disaster and public health responses).

During each three-year tenure on the team, members take part in professional development activities and exercises to maintain and enhance their response skills. Funded by governments, NBRT is managed by AHA in non-outbreak times, with the Department of Agriculture, Water and Environment managing their deployment in an EAD response.

International Animal Health Emergency Reserve

Australia is a signatory to the International Animal Health Emergency Reserve (IAHER), an arrangement between Australia, Canada, Ireland, New Zealand, the United Kingdom and the United States to share personnel and resources during an EAD outbreak. Activation of IAHER arrangements allows Australian personnel to receive valuable practical response experience, and this strengthens Australia's response capacity.

Emergency wildlife disease response guidelines

In 2019 the Australian Government Department of Agriculture, Water and the Environment recognised the need for a high-level framework for the management of an emergency wildlife disease (EWD) response. This led to the development of guidelines by WHA⁵⁵ to articulate the authority, roles and responsibilities of agencies during an EWD response in Australian native animals

55 <https://wildlifehealthaustralia.com.au/WHADocuments.aspx>

and how a response is to be managed. These guidelines, published in 2020, were developed using AUSVETPLAN's framework.

Other preparedness activities

EAD training

A range of training opportunities is available across Australia to increase awareness of EADs and response management, and to develop skills in emergency response functions.

Face-to-face EAD awareness training provides government officers, private veterinary practitioners and livestock industry workers with guidance on how to recognise EADs and on their reporting obligations. This type of training is usually provided by state and territory governments and industry bodies.

AHA's online Emergency Animal Disease Foundation course⁵⁶ provides a general introduction to emergency animal disease response arrangements in Australia.

AHA also holds twice-yearly workshops to prepare industry executives, senior government officers and technical specialists to be involved with the two key response decision-making bodies, NMG and CCEAD.

AHA develops a range of national EAD training and communication resources by consulting with members of the National Animal Health Training Reference Group, which is convened annually by AHA. The group comprises representatives from government and livestock industry organisations and provides guidance and consistency on AHA's EAD training program.

Vaccine banks

Australian governments and livestock industries collaboratively fund vaccine banks to allow rapid production, storage and delivery of foot-and-mouth disease (FMD) or anthrax vaccine should it be required in an outbreak.

AHA manages these vaccine banks on behalf of its members. AHA also has contracts in place for cold storage and distribution of vaccines.

The manufacture, storage and supply agreement for the Australian FMD vaccine bank expired in

December 2019 and was replaced with a new agreement for the period 2020–2024.

The anthrax vaccine bank has been renewed for the period 2019–2025.

Emergency animal disease resources for veterinarians

In 2019, the Australian Government Department of Agriculture, Water and the Environment, in partnership with the Commonwealth Scientific and Industrial Research Organisation, published a comprehensive online field guide for EADs.⁵⁷ The guide was developed to support veterinarians in the field to include appropriate EADs in their differential diagnoses, and to take appropriate action if presented with signs of an unusual disease.

An EAD Surveillance Online Training package⁵⁸—collaboratively developed by all Australian veterinary schools and information technology partner Epi-Interactive—was also released in 2019 to educate veterinarians and veterinary students in the detection, investigation, reporting and management of EADs.

These initiatives strengthen Australia's preparedness and ability to manage significant animal biosecurity threats, and were funded by the *Agricultural Competitiveness White Paper*.⁵⁹

Biosecurity Top Watch

The Biosecurity Top Watch public awareness campaign is an important tool in improving the likelihood of early detection of an exotic pest or disease incursion. Various strategies have been used to promote public interest in biosecurity and consequences of an exotic pest or disease incursion into northern Australia. These include the engagement of celebrity and industry biosecurity champions to endorse targeted messaging under the Agricultural Competitiveness White Paper initiative.

56 www.animalhealthaustralia.com.au/emergency-animal-disease-training-program

57 www.outbreak.gov.au/for-vets-and-scientists/emergency-animal-diseases-guide

58 eadonline.com.au

59 www.agriculture.gov.au/ag-farm-food/agriculture-white-paper

Timeline of eradicated diseases

Strengthened general surveillance has been identified as a priority in key strategic biosecurity-related documents in Australia, including in the Intergovernmental Agreement on Biosecurity. For diseases that have been eradicated within the previous 25 years, Australia follows OIE *Terrestrial Animal Health Code* (OIE code) recommendations for surveillance. Australia successfully eradicated bovine brucellosis, bovine tuberculosis (TB), equine influenza (EI) and virulent Newcastle disease during the preceding 30 years.

1989

Australia declared freedom from bovine brucellosis

Australia declared freedom from bovine brucellosis (*Brucella abortus*) in 1989. Targeted surveillance for *B. abortus* continued until the end of 1993. Australia uses general surveillance to demonstrate its ongoing freedom from *B. abortus*. State and territory veterinary laboratories test for *B. abortus* as part of abortion investigations and for other reasons. Additional testing is done to meet export requirements for certain markets. Species other than cattle are also sampled.

1997

Australia declared freedom from bovine TB

Australia declared freedom from bovine tuberculosis (bovine TB or *Mycobacterium bovis*) in 1997, in accordance with recommendations in the OIE code.

2002

Australia's last case of bovine TB was reported in buffalo

The last case of bovine TB was reported in 2002 in buffalo. Australia uses general surveillance to demonstrate its ongoing freedom from bovine TB. In addition, the *Australian Standard for Hygienic Production and Transportation of Meat and Meat Products for Human Consumption* (AS 4696:2007)* requires that all carcasses and their parts are inspected by a meat safety inspector. Because bovine TB is an exotic animal disease in Australia, suspicious granulomas identified when cattle carcasses are inspected at slaughter establishments, including export abattoirs, are submitted for testing to exclude *M. bovis* as a cause. Additional testing is done to meet export requirements for certain markets.

2003

Australia declared freedom from virulent ND

Australia's last outbreaks of virulent Newcastle disease (ND) were in 2002. The two incidents affected single properties and the disease was eradicated. In accordance with recommendations in the OIE code, Australia declared freedom from virulent ND in 2003. Non-pathogenic (lentogenic) ND virus strains are present in Australia. However, as of 2017, all long-lived chickens in flocks greater than 1000 birds are required to be vaccinated. In addition, broiler chickens in New South Wales and Victoria are required to be vaccinated. Vaccination of broilers in other jurisdictions is optional. Australia uses general surveillance to demonstrate its ongoing freedom from virulent ND in poultry populations. For additional information about the 2002 outbreak and response, visit AHA's website.**

2007

Australia experienced a large outbreak of EI. The last case was reported later that year

In August 2007, Australia experienced a large outbreak of EI. National eradication of the disease was successful and the last case was reported in December 2007.

2008

Australia declared freedom from EI

In accordance with recommendations in the OIE code, Australia declared freedom from EI in December 2008. Australia uses general surveillance to demonstrate its ongoing freedom from EI.

* www.publish.csiro.au/book/5553

** www.animalhealthaustralia.com.au/what-we-do/endemic-disease/newcastle-disease

A large school of fish swimming in blue water, viewed from above. The fish are densely packed and moving in a coordinated pattern, creating a sense of movement and depth. The water is a deep, clear blue, and the fish are silhouetted against the lighter blue background.

3

Aquatic animal health



3.1 National aquatic animal health policy governance

Australia's national aquatic animal health policy and programs are developed from sound scientific evidence. The Subcommittee on Aquatic Animal Health (SCAAH) is an advisory committee to the Animal Health Committee (AHC). It supports AHC's animal health policy deliberations by providing robust scientific and technical advice on aquatic animal health issues. SCAAH comprises representation from the Australian Government, the state and Northern Territory governments, the New Zealand Government, the Commonwealth Scientific and Industrial Research Organisation Australian Centre for Disease Preparedness (ACDP or CSIRO-ACDP) and Australian universities. The National Aquaculture Council is also an observer on SCAAH. AHC reports to the National Biosecurity Committee for high-level endorsement of decisions and policy (see Figure 1.1 for the structure of animal health management organisations and committees).

3.2 AQUAPLAN

Australia's aquatic animal health management system has been shaped by the collaborative efforts of Australia's aquatic animal industries and government agencies through AQUAPLAN. AQUAPLAN is Australia's National Strategic Plan for Aquatic Animal Health. The plan outlines objectives and priorities ranging from biosecurity, diagnostics, surveillance, preparedness and response through to international leadership, enhancing Australia's management of aquatic animal health. AQUAPLAN has successfully attracted substantial direct investment and in-kind contributions to address its agreed priorities.

There have been three national strategic plans for aquatic animal health to date: *AQUAPLAN 1998–2003*; *AQUAPLAN 2005–2010*; and *AQUAPLAN 2014–2019*. These have delivered a number of significant achievements for Australia’s national aquatic animal health system (see Figure 3.1). A fourth *AQUAPLAN* is currently being developed.

Australia has a consistent national framework of enterprise-level biosecurity guidance resources...

**AQUAPLAN
1998–2003**

**AQUAPLAN
2005–2010**

**AQUAPLAN
2014–2019**

Outcomes	Outputs
<ul style="list-style-type: none"> • A consistent national framework of response plans for aquatic animal disease emergencies in Australia • Nationally consistent requirements for disease reporting in support of international reporting obligations • Support Australia’s aquatic industries and health managers by providing resources to recognise significant aquatic animal diseases 	<ul style="list-style-type: none"> • AQUAVETPLAN (aquatic animal disease veterinary emergency plan) • National list of reportable diseases of aquatic animals • Quarterly Aquatic Animal Disease Reporting System • A field identification guide for aquatic animal diseases
<ul style="list-style-type: none"> • Access to specialised aquatic animal health education and training opportunities for those with a role in aquatic animal health management • Improved investigation and reporting of major wild fish kills through the development of a national protocol • Access to a national program for aquatic animal disease diagnostic laboratories to test and improve diagnostic capabilities 	<ul style="list-style-type: none"> • A national aquatic animal health training scheme • National fish kill investigation protocols • Inter-laboratory diagnostic proficiency testing program
<ul style="list-style-type: none"> • Improved access to best-practice biosecurity planning and guidance tailored to specific aquaculture sectors • Pending ratification, emergency aquatic animal disease response arrangements that strengthen emergency preparedness arrangements and risk mitigation • A nationally consistent program for abalone aquaculture enterprises to establish disease-free compartments to facilitate market access and domestic trade • Improved access by industry to priority veterinary medicines • Improved communication of the progress made through <i>AQUAPLAN 2014–2019</i> activities 	<ul style="list-style-type: none"> • Enterprise level biosecurity plans including national generic guidelines and templates, and a series of sector-specific biosecurity plans • A complete draft emergency aquatic animal disease response agreement (Aquatic Deed) • Abalone health accreditation program • Progression of over 15 veterinary medicines to minor use permits with the Australian Pest and Veterinary Medicine Authority • <i>AQUAPLAN 2014–2019</i> seminar series

Figure 3.1 Examples of major achievements from *AQUAPLAN*

3.3 National aquatic animal health policy and programs

Australia's national aquatic animal health policy and programs are developed from sound scientific evidence, and aim to achieve several key objectives:

- Enterprise biosecurity – stronger biosecurity measures for managing aquatic animal disease risks
- Diagnostic capability – maintaining and strengthening national diagnostic capability (see Chapter 5)
- Surveillance – a national system that supports early detection and defines our disease status
- Preparedness and response – national approach to preparedness arrangements and effective national coordination of emergency aquatic animal disease incidents

Enterprise biosecurity

Biosecurity here means the practices and systems put in place to protect the aquatic animal industry

from diseases. These practices and systems reduce the risk of damaging diseases entering aquaculture farms. They can prevent health issues emerging, and can reduce the impacts of disease when it occurs.

As an effective tool to manage biosecurity risks on aquaculture farms, Australian governments, in conjunction with aquaculture industries, developed a series of enterprise-level biosecurity plans as part of the priority activities of *AQUAPLAN 2014–2019*.

A biosecurity plan aims to:

- reduce the risk of disease being introduced into an aquaculture farm (entry-level biosecurity);
- reduce the risk of disease spreading within the farm (internal biosecurity);
- reduce the risk of disease escaping from the farm (exit-level biosecurity); and
- have emergency response protocols in place for serious disease outbreaks (all three levels of biosecurity).





Image credit: Shutterstock

National aquaculture farm biosecurity plans

Australia has a consistent national framework of enterprise-level biosecurity guidance resources, such as a generic aquaculture farm biosecurity plan published in 2016. The generic biosecurity plan guidelines and template aim to guide the development of biosecurity plans at the farm level. They have been developed as generic documents and can be adapted to develop biosecurity plans for specific aquaculture sectors or production systems.

Several sector-specific biosecurity plans were subsequently developed and published for land-based abalone farms, oyster hatcheries and, more recently, barramundi farms and prawn farms. The plans contain information on how to assess disease risks and how to design and maintain on-farm biosecurity plans. Each plan includes template forms, checklists and signage to make it easier for farms to produce biosecurity plans that are fit-for-purpose, practical, cost-effective and auditable.

The development of further sector-specific biosecurity plans is anticipated, including for marine sea-cage fish farming and Australian native freshwater fish farming industries. These plans empower farmers to protect their investments and take an active role in Australia's broader biosecurity system.

Aquatic animal health surveillance

National surveillance programs

Australia's aquatic animal health surveillance system has a number of components. Passive (general) surveillance is the process whereby disease in animals is observed and the observer initiates an investigation of the problem, which may lead to a diagnosis. The other type of surveillance is active or targeted surveillance, in which animals are sampled to determine their status for a particular disease. Australia has a number of national active (targeted) surveillance programs, each of which is designed to meet specific objectives (e.g. trade, disease control and eradication). Collectively, these elements constitute Australia's national surveillance system.

National surveillance program for white spot syndrome virus

From late 2016 to early 2017, Australia experienced an outbreak of white spot disease on seven farms in southeast Queensland. In response to the outbreak, a nationally coordinated surveillance program for white spot syndrome virus (WSSV) was commenced in November 2017. The objective of the national surveillance program was to demonstrate national freedom—or alternatively zone freedom—from WSSV. The national surveillance program meets requirements stipulated in the World Organisation



for Animal Health (OIE) Aquatic Animal Health Code for a country that wishes to demonstrate either national or zone freedom after an outbreak of an OIE-listed disease.

The program comprises four components of surveillance:

- delimitation surveillance within and in the vicinity of the infected zone;
- risk-based active surveillance for wild crustacean populations in the areas outside the infected zone;
- passive surveillance for farmed prawn populations; and
- testing of broodstock and postlarvae as part of interstate translocation protocols.

This surveillance demonstrated WSSV freedom for all areas of Australia apart from the infected zone in Queensland.

Abalone Health Accreditation Program

Abalone viral ganglioneuritis caused by *Haliotid herpesvirus-1* (HaHV-1) was first detected and reported in Australia on land-based abalone farms in Victoria in 2005, and later in Tasmania in 2008. Following outbreaks on farms in each state, the virus was subsequently detected in wild abalone populations.

To promote safe translocation of abalone between jurisdictions, the Abalone Health Accreditation Program (AHAP) was established in 2014 to enable the abalone aquaculture industry to demonstrate compartment freedom from diseases of concern. AHAP ensures surveillance, biosecurity, auditing and accreditation requirements are nationally consistent and transparent. AHAP is also consistent with the compartmentalisation standards for infection with HaHV-1 described in the OIE Aquatic Animal Health Code.

The scheme provides:

- advice to industry and government on recommended minimum requirements for intra- and interstate movements;
- cost-effective and safe translocation of live abalone and product between farms and/or jurisdictions;
- compliance with export certification requirements;
- health-certified abalone stock suitable for open and semi-open systems (re-seeding/stock enhancement/open water aquaculture); and
- auditable accreditation scheme controlled by the Competent Authority.

AHAP has successfully provided industry and government with a nationally consistent disease-free compartmentalisation program to facilitate cost-effective and safe translocation of live abalone and product between farms and/or jurisdictions. It also contributes to facilitating international trade and instilling confidence in trading partners as to the quality and health status of Australian abalone. For example, the ongoing compartment free status of infection with HaHV-1 for AHAP facilities afforded new market access for frozen abalone for human consumption in Canada.

Surveillance tools

Neptune – Australian aquatic animal disease information management system

Neptune⁶⁰ is Australia's aquatic animal disease information management system, collaboratively developed by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and

⁶⁰ <https://neptune.csiro.au>

the Department of Agriculture, Water and the Environment. All information on Neptune has been contributed by Australia's aquatic animal community, including national, state and territory governments, aquatic animal industry researchers and other aquatic animal health professionals. Neptune is an online database of all published reports of aquatic animal diseases and pathogens in Australia, some of which contain high resolution whole-slide digital images of histopathology. The database can be accessed by any interested stakeholder as a tool for sharing aquatic animal health knowledge.

Aquatic animal disease field guide

The *Aquatic Animal Diseases Significant to Australia: Identification Field Guide* aims to assist in disease recognition and to facilitate reporting of aquatic animal diseases. It provides useful information on significant aquatic animal diseases to people who work closely with aquatic animals, who are usually the first to notice signs of a significant disease event.

The 5th edition incorporates new and updated information gathered from an extensive review of the 4th edition. It now covers 53 aquatic animal diseases of significance to Australia that affect finfish, crustaceans, molluscs and amphibians.

The field guide is available as Word and PDF documents⁶¹ and as an app for mobile devices. The app can be freely downloaded through the App Store (Apple devices) and Google Play (Android devices).

Antimicrobial resistance in aquaculture

The aquaculture sector is becoming increasingly aware of the need to better understand antimicrobial usage and the extent of antimicrobial resistance (AMR) both in Australia and internationally. This issue was discussed at the 4th OIE Global Conference on Aquatic Animal Health in April 2019, where countries were encouraged to improve their data collection for better AMR understanding and to develop policies to deal with this issue.

⁶¹ www.agriculture.gov.au/animal/aquatic/guidelines-and-resources/aquatic_animal_diseases_significant_to_australia_identification_field_guide

Australia's national antimicrobial resistance strategy – 2020 and beyond (see Chapter 7), published by the Australian Government, guides actions on issues relating to AMR and antimicrobial use. The strategy calls for more efforts in communication to raise awareness and to improve knowledge and evidence of antimicrobial resistance through AMR surveillance and research for animal industries, including aquaculture.

Seafood safety and traceability

Ensuring the safety and traceability of Australia's seafood exports is vital to maintaining consumer confidence in product quality, safety and authenticity. The *Export Control (Fish and Fish Products) Orders 2005* require export-registered manufacturing establishments to obtain raw materials only from other export-registered establishments. It is the responsibility of export-registered manufacturing establishments to comply with legislative requirements to ensure safety and traceability of products sourced. Export-registered establishments' compliance with these requirements is subject to audit by the Department of Agriculture, Water and the Environment.

Legislative requirements applicable to the sourcing of fishery products for export include a requirement for the receiving establishment to have a fully documented food safety management system in place, called an 'approved arrangement'. An approved arrangement describes the controls that the establishment has implemented to ensure compliance with:

- identification and control of potential hazards;
- structure and hygiene requirements for catcher boats; and
- standards for harvesting and sourcing fish product.

Under Australia's food standards code, fish must be sourced from suppliers with traceability systems in place and with up-to-date supplier details. This enables each fish lot and ingredient, where applicable, to be traced back to the supplier.

Aquatic animal disease emergency preparedness

Australia's national system to prepare for and respond to aquatic emergency animal diseases (EADs) encompasses all activities relating to disease surveillance, planning, monitoring and response. These activities are carried out by the Australian Government, state and territory governments, aquatic animal industries, universities, CSIRO-ACDP, private laboratories and private veterinarians.

The Aquatic Consultative Committee on Emergency Animal Diseases (Aquatic CCEAD) coordinates the national technical response to aquatic animal disease emergencies. The Aquatic CCEAD comprises:

- the Australian Chief Veterinary Officer;
- representatives from the Department of Agriculture, Water and the Environment;
- the chief veterinary officer (or the director of the fisheries department) in each state and territory government; and
- the Director of CSIRO-ACDP.

As with terrestrial animal disease emergencies, operational responsibility for the response to an aquatic EAD in an Australian state or territory primarily lies with the relevant jurisdiction. Each state and territory government brings together a broad range of resources to assist fisheries, aquaculture and aquatic animal health authorities to address disease incidents. Experts from other jurisdictions may be called on to assist in the response, if required. The Department of Agriculture, Water and the Environment provides a national coordination role for response activities through chairing and supporting the operation of the Aquatic CCEAD. The Aquatic CCEAD assesses the situation and provides advice on management of the outbreak until it is determined that the disease has been eradicated or that a response is no longer feasible or cost effective.

AQUAVETPLAN

The Australian Aquatic Veterinary Emergency Plan (AQUAVETPLAN) is a series of technical response plans that describe the proposed Australian approach to an aquatic EAD. The plans

Each state and territory government brings together a broad range of resources to assist fisheries, aquaculture and aquatic animal health authorities to address disease incidents.

provide technical information and preferred policy approaches to guide responses to a disease outbreak in Australia.

AQUAVETPLAN aligns with the Australian Veterinary Emergency Plan (AUSVETPLAN) for terrestrial animal disease responses. Disease strategy manuals provide guidance for animal health professionals to respond appropriately to outbreaks of specific EADs in Australia. Operational manuals address important procedural issues (for example, destruction, disposal and decontamination) and complement the disease strategy manuals.

AQUAVETPLAN manuals can be downloaded from the Department of Agriculture, Water and the Environment website.⁶²

⁶² www.agriculture.gov.au/animal/aquatic/aquavetplan

4

Traceability, biosecurity and quality assurance



4.1 Identification and traceability programs

National Livestock Identification System

The National Livestock Identification System (NLIS) is Australia's system for livestock identification and traceability. All cattle, goat, pig and sheep producers must identify their stock and record their movements onto and off properties in the NLIS database. All movements to and from saleyards and to abattoirs must also be recorded. NLIS is a permanent, whole-of-life system that allows animals to be identified – individually or by mob – and tracked from property of birth to slaughter, for the purposes of food safety, product integrity and market access.

NLIS enhances Australia's ability to track livestock during disease and food safety incidents. It reflects Australia's commitment to biosecurity and food safety, and provides a competitive advantage in a global market.

NLIS combines three elements to enable the lifetime traceability of animals:



An animal identifier



Identification of a physical location through a Property Identification Code (PIC)



A web-accessible central database to store and correlate movement data and associated details

All animals are identified with an accredited NLIS tag or device from their property (PIC) of birth. As animals are bought, sold and moved along the

supply chain, each movement is recorded centrally on the NLIS database. Using this information, NLIS can provide a life-history of an animal's movements.

Australian state and territory governments are responsible for the legislation that governs animal movements and implementation of NLIS. Jurisdictions monitor compliance with NLIS requirements throughout the livestock supply chain, checking the consigning, receiving and slaughtering of stock. Information on animal movements is recorded on movement documents (National Vendor Declarations [NVDs], or the PigPass⁶³ NVD for pigs) and submitted to the NLIS database by producers, saleyard operators, livestock agents and processors.

The Integrity Systems Company administers the NLIS database for industry and government stakeholders. NLIS is endorsed by major producer, feedlot, agent, saleyard and processor bodies, and is certified by International Organization for Standardization (ISO) 9001.

Industry identification and traceability programs

Chicken meat traceability

Due to the highly vertically integrated nature of the chicken meat industry, processing companies maintain comprehensive records on batches of chicken meat processed, which allows rapid tracing of chickens back to breeder farm. This includes tracing back from birds processed at any time to specific farms of origin, and to sheds within a farm. Product can also be further traced back to the hatchery where the chicks were hatched, and to the breeder farm that supplied the fertile eggs from which those chicks hatched. Chickens are managed on a flock basis from the hatchery to the farm and into the processing plant.

Egg traceability

Egg stamping is a compulsory requirement for all commercial hen egg producers in Australia. Every whole egg sold or supplied in Australia must have, on its shell, a unique identifying mark so that it can be traced back to the farm of origin. Traceability is a key component of the egg industry's food safety management plan. It protects consumers and

⁶³ <https://pigpass.australianpork.com.au/faq>

Beekeepers who wish to become certified must undergo nationally recognised training provided by AUS MEAT through its registered training organisation.

producers alike, by allowing the identification of the source farm in the event of a food safety incident involving eggs. Each state and territory has laws and regulations relating to the accreditation of egg businesses and the stamping of eggs. These laws are linked to the requirements of the Food Standards Code, namely *Standard 4.2.5 – Primary Production and Processing Standard for Eggs and Egg Products*.⁶⁴

4.2 Industry biosecurity and quality assurance programs

B QUAL

The B QUAL food safety program is a voluntary quality assurance (QA) program for apiarists and honey-processing businesses, ensuring that the honey bee industry's standards meet best practice and domestic and international market demands. The program is owned by the Australian Honey Bee Industry Council (AHBIC), managed by B QUAL Australia's Board and administered by AUS QUAL (a certification body accredited by the Joint Accreditation System of Australia and New Zealand). B QUAL standards encompass all facets of honey production and industry services, including honey production, queen bees, pollination and honey packing.

Beekeepers who wish to become certified must undergo nationally recognised training provided by AUS MEAT through its registered training organisation.

⁶⁴ www.legislation.gov.au/Details/F2018C00937

Once a beekeeper has integrated B QUAL requirements into their operation, the business is audited by an Exemplar Global third-party auditor. Certification is provided by AUS QUAL. Beekeepers selling direct to the public are audited every year. Those selling bulk honey to packers only are audited once every two years.

The B QUAL program provides comprehensive work instructions and record forms that must be maintained for:

- Hive management (identification, location, movement and disease status)
- Extraction (process, facilities and equipment)
- Traceability from hive to retail
- Biosecurity
- Hygiene (personal, machinery maintenance, sanitation and vermin control)
- Purchases (inventory lists and stocktake activities)
- Equipment calibration
- Internal and external audit results
- Staff training
- Occupational health and safety issues

If a beekeeper shows they are audited to B QUAL standard and have current certification, a number of state government departments now accept, without further auditing, B QUAL accreditation as being compliant with the *Australian Honey Bee Industry Biosecurity Code of Practice* (the Code).

National Bee Biosecurity Program

The National Bee Biosecurity Program (NBBP) is managed and administered by Plant Health Australia (PHA) on behalf of AHBIC. The National Bee Biosecurity Program includes the employment of Bee Biosecurity Officers (BBOs) in New South Wales, Queensland, South Australia, Tasmania, Victoria and Western Australia. Underpinning the Program is the Code.⁶⁵ The Program, through the Code, aims to improve the management of established bee pests and diseases (particularly American foulbrood) and to increase the preparedness of beekeepers for exotic pests (including pest bees). The program is funded by the

⁶⁵ <https://beeaware.org.au/wp-content/uploads/2017/09/Australian-Honey-Bee-Industry-Biosecurity-Code-of-Practice.pdf>

honey bee industry through the honey levy, with state governments contributing in-kind resources.

BBOs support beekeepers in understanding their biosecurity obligations under the Code, and provide general advice on pest and disease management practices, while performing a variety of extension- and education-based activities. These include attendance at industry field days, presentations at beekeeper club meetings, delivery of workshops and apiary visits.

To assist beekeepers to be compliant with the Code and to provide advice on keeping honeybees healthy using industry best practice, an online training course, *Biosecurity for Beekeepers*,⁶⁶ was launched in April 2017.

NBBP also looks to harmonise the movement of honey bees and honey bee products between States.

The BeeAware⁶⁷ website provides substantial materials to support the Code, as well as access to the online training course and templates to facilitate better record-keeping for hive inspections and reporting notifiable diseases. Furthermore, the Code has been published in Arabic, Greek, Italian and Turkish, allowing it to reach even further into the beekeeping community.

Livestock Production Assurance

The Livestock Production Assurance (LPA) program⁶⁸ is the Australian red meat industry's on-farm assurance program covering food safety, animal welfare and biosecurity. It provides evidence of livestock history and on-farm practices when transferring livestock through the value chain.

Producers declare this information on LPA NVDs, which are required for all livestock movements including property-to-property, through saleyards, direct to processors and feedlots, and the live export trade. The program (including LPA QA) is managed on behalf of the red meat industry by the Integrity Systems Company and is independently audited. Producers who choose to become LPA-accredited commit to carrying out on-farm

⁶⁶ <https://beeaware.org.au/training>

⁶⁷ <https://beeaware.org.au>

⁶⁸ www.integritysystems.com.au/on-farm-assurance/livestock-product-assurance

practices that support responsible red meat production and the integrity of the traceability system.

The LPA program, LPA NVD and NLIS make up Australia's red meat integrity system covering cattle, sheep and goats. This integrity system protects the disease-free status of Australian red meat and underpins the marketing of our product as clean, safe and natural.

The seven LPA requirements are:

- Property risk assessment – to assess the risk of livestock on a property being exposed to areas that are contaminated with organochlorides or other persistent chemicals
- Safe and responsible animal treatments – to ensure that livestock intended for human consumption do not contain unacceptable chemical residues or physical hazards
- Stock foods, fodder crops, grain and pasture treatments – to ensure that livestock are not exposed to feeds containing unacceptable contamination, especially animal products or unacceptable chemical residues
- Preparation for dispatch of livestock – to ensure that livestock to be transported are fit for the journey and not unduly stressed, and that contamination is minimised during on-farm assembly and transport to the destination
- Livestock transactions and movements – to ensure that movements of livestock can be traced, if necessary, and that the livestock are accompanied by information on their status regarding exposure to chemical residues
- Biosecurity – to ensure that the risks of introducing infectious diseases to livestock production properties and spreading diseases between properties are minimised
- Animal welfare – to ensure that livestock management is consistent with the requirements of the relevant Australian Animal Welfare Standards and Guidelines

Producers are required to renew their LPA accreditation every three years to ensure that their knowledge of the program is up to date. While LPA is a voluntary program, it is recognised both domestically and internationally and is demanded by supply chains around the globe.



Image credit: Animal Health Australia

National Feedlot Accreditation Scheme

The National Feedlot Accreditation Scheme (NFAS)⁶⁹ is the Australian cattle feedlot industry's QA scheme and is the cornerstone of eligibility for beef to be described as 'grain-fed' within prescribed industry standards. The program encompasses QA elements for animal health and welfare, environmental management, food safety and product integrity.

A key requirement of NFAS is that all feedlots are audited annually, which promotes independent verification of practices within a feedlot and ensures that consumers can maintain confidence in the way grain-fed beef is produced. NFAS is underpinned by industry integrity systems, which include biosecurity planning, livestock traceability and food safety. These fundamental principles promote the Australian feedlot sector as a responsible and ethical producer of protein, further strengthening the confidence consumers have in Australian produce.

The Australian Lot Feeders' Association views their QA program as an ever-evolving set of standards that continue to improve production methods and compliance with NFAS standards.

⁶⁹ www.ausmeat.com.au/services/list/livestock/nfas



Q-Alpaca

Q-Alpaca is a voluntary alpaca QA program maintained by the Australian Alpaca Association.

The Q-Alpaca program is designed to: encourage easier and more affordable diagnosis monitoring and management of known diseases; ensure that any deaths within herds are professionally investigated by an approved veterinarian; and reduce the risk of an Emergency Animal Disease (EAD) incursion to herds.

The program comprises forms for herd- and property-management plans, animal registrations, Annual Stock Returns and agreements with approved veterinarians to conduct a post-mortem examination on any animal over 12 months of age that dies or is euthanased for any reason, or on any cria under 12 months of age with a history of wasting or diarrhoea that dies or is euthanased.

APIQ[✓][®]

The Australian Pork Industry Quality Assurance Program (APIQ[✓][®])⁷⁰ is a key platform providing confidence to consumers, regulators, markets and the Australian public that pig production standards are of a high level.

⁷⁰ www.apiq.com.au

APIQ[✓][®] is an independently audited program that verifies producer compliance with management, food safety, animal welfare, biosecurity, traceability, environment and transport standards.

A producer can be certified as:

- APIQ[✓][®], which indicates that their pigs are primarily indoors
- APIQ[✓][®] Free Range, which means that all pigs live outdoors with free access to shelter at all times
- APIQ[✓][®] Outdoor Bred, Raised Indoors on Straw, which means that breeding stock have free access to paddocks at all times, and piglets have free access to paddocks at all times until weaning, when they are moved to indoor group housing with bedding

APIQ[✓][®] also provides voluntary verification options for specific customers or markets, such as:

- Gestation Stall Free
- Customer Specifications for Coles

APIQ[✓][®] certification incorporates the recommendations set out in the *Model Code of Practice For the Welfare of Animals: Pigs*. Certification enables producers to demonstrate that they are meeting relevant national standards alongside state and territory legislative

requirements, and are following best-practice industry guidelines.

APIQ✓® standards are outcome-focused and supported by performance indicators. Supplementary information to help producers comply with the standards is provided in manuals on the APIQ✓® website, including a compliance guide and an auditor guide for auditors.

The APIQ✓® program undergoes an annual system audit, conducted by an independent certifying body, to ensure that its policies, processes and administration are robust, reliable and of a high standard.

APIQ✓® underpins the PigPass NVD, which includes sections relating to pig ownership and health status. When the PigPass NVD is linked to a certified and audited on-farm QA program such as APIQ✓®, it meets the requirements of state food and agriculture authorities, the Australian Government export market, and Food Standards Australia New Zealand (FSANZ) *Australian Standard for the Hygienic Production and Transportation of Meat and Meat Products for Human Consumption* (AS 4696:2007).⁷¹

Australian Chicken Meat Federation's quality systems

The Australian Chicken Meat Federation (ACMF) maintains and promotes the *National Farm Biosecurity Manual for Chicken Growers*.⁷² This manual sets out the minimum biosecurity requirements that must be implemented on meat chicken farms in Australia. Compliance with the manual is obligatory for chicken growers under their contractual arrangements with the chicken-processing companies they supply. The manual includes an auditable checklist, and companies periodically assess their growers for compliance with the measures identified in the manual.

Implementation of the procedures in the manual also mostly satisfy the requirements for poultry farming specified in the *Primary Production and Processing Standard for Poultry Meat*⁷³ issued by FSANZ. This standard came into effect on 20

May 2012 and has been incorporated into state and territory legislative frameworks. Under the standard, all meat chicken farms must have an appropriate food safety management system in place.

Depending on the jurisdiction, farms may have to be licensed and have their food safety management system audited by the relevant jurisdictional authority and/or the processor to whom the farmer is contracted, to confirm that appropriate measures are in place to ensure food safety.

ACMF has also developed and made available to industry *Chicken Growers' Guide on Early Action in a Potential Emergency Disease*,⁷⁴ which is designed to provide advice on steps that should be taken by growers immediately should concerns arise regarding a suspicious disease on their property or in the event of an emergency disease in their area.

Chicken meat processing companies must also meet the standards required by their key customers, such as major supermarket chains and quick-service restaurants. These standards cover food safety, animal welfare and animal health, and in many cases, compliance with the standards is independently audited. Some customers have global supplier farm and animal welfare standards and assurance programs with which Australian chicken meat suppliers must also comply.

Most chickens farmed with access to an outside range area are accredited under the Free Range

Chicken meat processing companies must also meet the standards required by their key customers, such as major supermarket chains and quick-service restaurants.

71 www.publish.csiro.au/ebook/download/pdf/5553

72 www.farmbiosecurity.com.au/industry/chickens

73 www.legislation.gov.au/Details/F2012L00292

74 https://chicken.org.au/wp-content/uploads/2018/05/ACMF_GrowersGuideline_EmergencyDisease_May18Revised_180530F.pdf

Egg and Poultry Australia⁷⁵ certification program. Compliance with these standards is independently assessed. Most chicken meat producers in Australia comply with the Royal Society for the Prevention of Cruelty to Animals (RSPCA) Approved Farming Scheme⁷⁶ standards, and RSPCA staff assess compliance with scheme standards.

Egg Standards of Australia

Australian Eggs Limited developed Egg Standards of Australia (ESA),⁷⁷ a voluntary national egg QA program, on behalf of the egg industry. ESA is a unique QA scheme with two components that promote best practice across all elements of egg production, from pullet rearing to packing safe, quality eggs for consumers.

ESA addresses:



Hen welfare



Egg quality



Biosecurity



Food safety



Work health and safety



Environmental management

ESA for Rearing and Laying Farms has been in operation since April 2017, replacing the previous QA program (Egg Corp Assured). ESA for Grading and Packing Floors was released in November 2018. Since the launch of both ESA for Rearing

⁷⁵ <https://frepa.com.au>

⁷⁶ <https://rspcaapproved.org.au>

⁷⁷ www.australianeggs.org.au/for-farmers/egg-quality-standards

and Laying Farms and ESA for Grading and Packing Floors, all farms under the previous scheme (Egg Corp Assured) have now transitioned to the ESA program.

Australian Eggs Limited entrusts audit management of ESA to four independent certification bodies whose auditing staff have Exemplar Global accreditation in food safety as a minimum qualification. Auditors must also attend the ESA auditor-training program held each year by Australian Eggs Limited. A program of verification and unannounced audits (following formal complaints) forms part of the program.

Dairy industry quality assurance program

The Australian dairy industry has a comprehensive QA system to ensure food safety from farm to consumer; product traceability throughout the supply chain is paramount. At a national level, FSANZ sets national mandatory standards under the Food Standards Code (specifically, *Standard 4.2.4 Primary Production and Processing Standard for Dairy Products*),⁷⁸ which are enforced by states and territories. All milk processors and dairy farm businesses are licenced with the state food regulators. Regular audits against licence conditions are undertaken by the state food regulatory authorities. Dairy businesses wishing to export must also comply with the requirements of the Department of Agriculture, Water and the Environment's *Export Control (Milk and Milk Products) Orders 2005*. All dairy companies have product identification and traceability systems to follow raw materials and products from farm to consumer.

The Australian dairy industry has developed and implemented quality management systems underpinned by comprehensive regulatory requirements. Customer needs, food safety and product traceability are vital to these quality systems, but other factors such as animal welfare, biosecurity and environmental sustainability are also important considerations in the development of quality management programs. Industry QA programs require all sectors of the supply chain to take responsibility for food safety.

⁷⁸ www.legislation.gov.au/Details/F2017C00335/Html/Text

SAFEMEAT has recognised dairy on-farm QA programs as meeting the food safety requirements of the *Australian Standard for the Hygienic Production and Transportation of Meat and Meat Products for Human Consumption* (AS 4696:2007).⁷⁹

Elements of these requirements include:

- From farm to product storage, all dairy businesses must be licensed by state food regulatory authorities. Individual food safety programs for farms and factories are approved by food regulatory authorities before licences are granted, and compliance is monitored through regular audits of both farms and factories.
- The Department of Agriculture, Water and the Environment has arrangements in place with food regulatory authorities for the enforcement of standards for exported dairy products.
- State departments of agriculture and primary industries enforce regulations for use of chemicals on farms, animal welfare, and control of animal diseases and biosecurity, including traceability.

Industry and government support programs underpin dairy QA programs, and the partnership between industry and government is a critical factor in its success. The food safety requirements of the dairy industry's on-farm QA program are complemented by recommended biosecurity elements to protect animal health; these elements cover provision of national disease control programs, including for enzootic bovine leucosis for dairy cattle, and Johne's disease.

Wool

Given Australia's strict biosecurity standards as well as the great distances involved between Australian wool production, wool testing and on-ship export, ready traceability is critical for the industry.

Each bale of fresh wool is traceable to the farm of origin, through a combination of:

- Wool Classer's Specification;
- National Wool Declaration;
- individual bale numbering and bale labels; and
- property identification detail.

⁷⁹ www.publish.csiro.au/ebook/download/pdf/5553

Other quality assurance programs

FeedSafe® and FAMI-QS

There are two verification and integrity programs for the Australian stock feed industry. FAMI-QS⁸⁰ is an international program specifically designed to meet the requirements of feed ingredient and additive manufacturers and suppliers. The Stock Feed Manufacturers' Council of Australia operates FeedSafe® for manufacturers of compound feeds. Both programs are recognised by the Australian Government as satisfying the requirements for the manufacture of safe feed. The central aspects of FAMI-QS and FeedSafe® are HACCP (which stands for Hazard Analysis and Critical Control Points), ISO (International Organization for Standardization) and the Code of Good Manufacturing Practices, with a focus on feed safety, workplace health and safety, risk assessment, biosecurity, treatment and handling of materials, training, traceability and product recall, and labelling requirements that meet state and territory legislation. FAMI-QS- and FeedSafe®-accredited suppliers and manufacturers play an integral role in the production of Australian food-producing livestock by producing more than 13 million tonnes of feed, which is more than 90% of the manufactured feed sold in Australia. These manufacturers feed approximately 90% of aquaculture animals, 99% of poultry; 90% of pigs; 60% of dairy cows; and 40% of grazing cattle, sheep and goats in Australia. They also produce feed for zoo animals and family pets. FeedSafe® was developed in consultation with the state and territory governments via their Chief Veterinary Officers, and was endorsed by the then Standing Council on Primary Industries. The Australian and state governments are notified of any critical non-conformance or any breach of legislation as identified during the audit.

Rendering standards

The *Australian Standard for the Hygienic Rendering of Animal Products* (AS 5008:2007)⁸¹ provides the framework for producing safe rendered products in Australia.

Each state or territory requires rendering plants to comply with the standard. Compliance is verified by regular audits performed by or on behalf of state and

⁸⁰ www.fami-qs.org

⁸¹ www.publish.csiro.au/book/5666

territory food authorities or by independent auditors.

The independent auditors also audit rendering plants against importing country requirements and the *Australian Renderers Association Code of Practice*,⁸² the latter of which underwent a comprehensive review and was adopted in 2018. This revised document strengthened traceability requirements and retained sample storage requirements.

Auditors report their findings to both the Australian Renderers Association and the Department of Agriculture, Water and the Environment, which uses these audits to consider approving rendering plants for export listing. The Department of Agriculture, Water and the Environment is notified of all critical non-compliances affecting applicable export operations. In some states and territories, the auditors also report results of audits or issues around compliance with product labelling requirements to the relevant state or territory authorities.

Pet Food Adverse Event System of Tracking

The Pet Food Adverse Event System of Tracking (PetFAST) is a voluntary joint initiative of the Australian Veterinary Association (AVA) and the Pet Food Industry Association of Australia (PFIAA). It is designed to track dog and cat health problems suspected of being associated with pet foods, treats or pet meats. The system enables veterinarians to report suspected pet food adverse events, and, where there is a trend or cluster identified, action can be initiated (such as the manufacturer voluntarily recalling suspect food) to investigate the cause.

All PetFAST reports are retained, and volunteers from AVA and PFIAA monitor these in real-time. Sometimes links are made with specific conditions and products that span years. Once a pattern or trend is identified, manufacturers can be rapidly notified of the suspected problem.

Seafood programs and standards

Australia's seafood comes from a combination of wild-capture and aquaculture sources. All producers and manufacturers consider public and consumer confidence in seafood safety to be of paramount importance. Australia has national, state and

territory food safety standards, legislation and regulations that cover the seafood supply chain from production through to processing under the requirements of the FSANZ Code (*Standard 4.2.1 Primary Production and Processing Standard for Seafood*).⁸³ Under this Standard, a seafood business must identify potential seafood safety hazards and implement controls that are commensurate with the risk. This Standard represents the minimum food safety and QA standard that an Australian seafood business must meet.

Many of the larger seafood industry sectors have developed their own QA programs, based on HACCP principles and good manufacturing practices that are tailored to their operations. For example, the Australian Shellfish Quality Assurance Program is a government-industry cooperative program designed to ensure that food safety of shellfish is managed under operational guidelines. The Fisheries Research and Development Corporation (FRDC) was accredited in October 2013 by the Accreditation Board for Standards Development Organisations to develop Australian standards for the seafood industry. FRDC manages the ongoing maintenance and development of the *Australian Fish Names Standard* (AS 5300),⁸⁴ which specifies nationally agreed names for all fish species in Australia. This allows for improved monitoring and stock assessment, consumer confidence and marketability, and improved capacity to manage seafood-related and food safety risks through improved species labelling and identification.

All individual seafood businesses are legally required to have a documented food recall plan in case a product has to be recalled. Similarly, all food safety agencies have well-developed emergency response strategies in place, and regularly trial them.

Other biosecurity programs

Farm Biosecurity Program

The Farm Biosecurity Program is a joint initiative of Animal Health Australia (AHA) and PHA. This campaign aims to help producers reduce the risks posed by diseases, pests and weeds to their crops and livestock by increasing understanding and implementation of on-farm biosecurity practices.

82 www.ausrenderers.com.au/index.php/downloads/category/3-standards?download=33:ara-code-of-practice-v3-2

83 www.legislation.gov.au/Details/F2012C00775

84 www.fishnames.com.au

The Farm Biosecurity website is a hub of information, tools and resources to help producers prevent both endemic and exotic diseases, pests and weeds from entering and becoming established on farms. It includes information on understanding disease, pest and weed risks, and how to minimise those risks through the implementation of good biosecurity practices, including:

- Crop and livestock specific information
- Templates for checklists, records and signs
- Animal health statements and declarations
- Biosecurity manuals
- Videos on the six biosecurity essentials
- A farm biosecurity planner and app
- Links to member and other useful websites
- Biosecurity related news and events

One Biosecurity program

One Biosecurity is a web-based platform, developed by Biosecurity SA in collaboration with the livestock industry, that allows producers to assess their biosecurity practices, develop an enterprise biosecurity profile, and share that with interested parties. The program's philosophy is aimed at raising the general level of biosecurity practice in the livestock industry to minimum industry standards while recognising those who have good practices through a scoring system.

A core component of the program is a biosecurity questionnaire, with built-in educational tools, that allows producers to assess and record their enterprise biosecurity practices. This enables the producer to determine if there are any gaps, and to work toward achieving or maintaining the most appropriate biosecurity level. The other core component of the program is a disease risk assessment, based on on-farm practices, that facilitates risk-based trading of livestock. It also offers the participant pathways for improvement and risk management of specific diseases of interest.

The One Biosecurity platform offers producers the option to share information on their existing assurance programs alongside routine animal health management practices such as treatments, vaccinations and parasite control, and to upload documents such as certificates or laboratory testing results to support premium disease status. The program is underpinned by a verification process, and data can be extracted from the program, thus

enabling animal health staff to identify areas of focus for mentorship activities. The program was designed to meet the growing demand for information about on-farm biosecurity practices, which are often the weakest links in the 'farm-to-fork' information chain. One Biosecurity brings about a greater level of transparency to livestock trade and greater insight into biosecurity risk management.

4.3 Biosecurity planning

AHA is the custodian of the Emergency Animal Disease Response Agreement (EADRA), a contractual arrangement between Australia's governments and industry groups to collectively increase Australia's capacity to prepare for – and respond to – EAD incursions.

As part of this, livestock industries develop, implement and maintain biosecurity plans at industry, regional and farm levels for their sector. The farm-level biosecurity plans identify measures to mitigate the risks of disease entry or spread. The plan for each EADRA party is initially endorsed by the other EADRA parties, and is subject to ongoing review and maintenance.

The plans are designed for producers to evaluate their own biosecurity requirements and to implement biosecurity practices suitable for their circumstances. The practices listed in the plans have been incorporated as standards into a range of industry QA and verification programs. These programs include APIQ[✓]®, ESA for Rearing and Laying Farms and NFAS. All farm-level biosecurity plans can be found on the AHA⁸⁵ and Farm Biosecurity⁸⁶ websites.

85 www.animalhealthaustralia.com.au/what-we-do/biosecurity-services/biosecurity-planning-and-implementation

86 www.farmbiosecurity.com.au/toolkit/plans-manuals

Melinee Leather

Farm Biosecurity Producer of the Year

Central Queensland cattle producer Melinee Leather and her husband Rob are leaders in applying sound on-farm biosecurity practices on their properties and sharing their knowledge with others. Their work as advocates for the importance of biosecurity practices secured them an Australian Biosecurity Award in 2019, in the Farm Biosecurity Producer of the Year category.

According to Melinee, managing biosecurity is one of the most important aspects of running their properties. They believe that good biosecurity underpins Australia's market access, and that without it our whole industry is at risk.

The Leathers have been practising proactive and preventive biosecurity on-farm for around 20 years, a decision that has helped them maintain a range of accreditations, including being certified organic and accredited under the European Union (EU) Cattle Accreditation Scheme, securing them a number of lucrative markets.

To meet their EU accreditation, all cattle on the property must be EU eligible and have NLIS devices with lifetime traceability. All cattle introduced to the properties are yarded for a minimum of seven days, placed in quarantine paddocks for a minimum of 21 days, and accompanied by NVDs and animal health declarations.

Having multiple properties some distances apart also requires a robust system for inter-property transfers and introduction of new stock to ensure that any potential spread of diseases, parasites or weeds can be controlled. However, stock introductions are just a small element of the biosecurity management plans in place on each of the Leathers' properties.

For people and vehicles coming onto the property, clear signage communicates biosecurity protocols, including the need to wash down the vehicle or remain in designated areas. Visitors are asked



Image credit: Jessica Howard Photography

to sign a visitors' log, while feedstuff and other farm inputs must be accompanied by a commodity vendor declaration. Other activities, such as weed management and infrastructure maintenance, are built into the daily routine on the property.

Whether Melinee, Rob and their team are mustering, fencing, doing general property work or water runs, everyone is looking at the cattle, the land and their surroundings for anything unusual. The Leathers firmly believe that, while biosecurity might add somewhat to the effort, time and money that goes into running the property, when biosecurity tasks are embedded properly, best-practice management can occur every day without conscious thought.

Both Melinee and Rob argue that biosecurity simply makes sense for anyone farming livestock, and they have worked extensively to convey the value of biosecurity to their industry peers, citing the impacts an outbreak will have on profitability, productivity and property values.

'Biosecurity is the responsibility of all of us, and collectively we will increase the effectiveness of our surveillance and the speed at which we can return to trade should an incursion occur.'

5

Animal health laboratories



5.1 Structures and responsibilities

Government laboratory networks

There are eight government animal health laboratories in Australia. The Commonwealth Scientific and Industrial Research Organisation Australian Centre for Disease Preparedness (ACDP or CSIRO-ACDP, formerly Australian Animal Health Laboratory [AAHL]) in Geelong, Victoria is the national animal health laboratory. There are also animal health laboratories in all six states and the Northern Territory. All government laboratories play a key role in testing to support disease surveillance and response, biosecurity policy, and domestic and international trade for animals and animal products. They are part of the Subcommittee on Animal Health Laboratory Standards (SCAHLs) (see below). Several of these laboratories also have a national leadership or coordination role in quality assurance (QA), training and research programs relating to laboratory preparedness and response.



Subcommittee on Animal Health Laboratory Standards

SCAHLs, which was originally formed in 1990, provides technical, scientific and policy support to the Animal Health Committee (AHC) in terrestrial animal health laboratory diagnostics and related matters. Under the current terms of reference (May 2019), SCAHLs consists of members from the Department of Agriculture, Water and the Environment, ACDP, all Australian state and territory government laboratories, Australia's university and private veterinary laboratories, and the New Zealand Ministry for Primary Industries. Animal Health Australia (AHA), National Association of Testing Authorities, Australia (NATA) and the Subcommittee on Aquatic Animal Health are regular observers on this group. Members from public health laboratories and various subject matter experts join its meetings as needed. The membership recognises the broad role laboratories play in various sectors of animal production and health as well as community health. The Department of Agriculture, Water and the Environment provides secretariat support to SCAHLs.

SCAHLs provides national leadership and coordination in diagnostic capability and capacity, which involves a range of essential laboratory functions for endemic and emergency animal diseases (EADs), including exotic and zoonotic diseases. These functions include QA, standard testing procedures, test development and evaluation, and training initiatives, as discussed below. SCAHLs also plays a key role in communicating matters of national interest

LEADDR laboratories work closely with public health laboratories as required for zoonoses and other veterinary public health issues.

about animal health diagnostic laboratories to government and non-government stakeholders. It maintains current data and information on its key activities and relevant national laboratory policies, procedures and resources through its website.⁸⁷ In 2019, SCAHLs formed a standing working group to coordinate the animal health laboratory aspect of antimicrobial resistance in support of Australia's National Antimicrobial Resistance Strategy.

Laboratories for Emergency Animal Disease Diagnosis and Response network

The Laboratories for Emergency Animal Disease Diagnosis and Response (LEADDR) network, which commenced in 2009, reports to SCAHLs and consists of members from the Department of Agriculture, Water and the Environment, ACDP, and state and territory government laboratories. The network is coordinated by ACDP and aims to standardise or harmonise screening performance for targeted EADs of terrestrial and aquatic animals in all member laboratories. This ensures a nationally coordinated approach and maximises the availability of national resources to meet demands for large-scale testing in an EAD outbreak.

LEADDR has developed various QA programs over the years, covering a number of targeted terrestrial and aquatic animal diseases. These diseases include African swine fever, avian influenza, bluetongue, classical swine fever, foot-and-mouth disease, Hendra virus infection, Newcastle disease, megalocytivirus infection, ostreid herpesvirus 1 microvariants infection, white spot disease, and others as directed by AHC. QA programs include the use of standard testing procedures and network quality controls for each test as well as proficiency testing (PT) activities.

To strengthen Australia's preparedness for and response to major disease emergencies, LEADDR members work closely with each other through monthly teleconferences and annual face-to-face meetings. To ensure access to specific expertise or materials that are not immediately available in Australia, LEADDR laboratories also maintain strong working relationships with various overseas animal health and other laboratories. LEADDR

⁸⁷ www.agriculture.gov.au/animal/health/laboratories

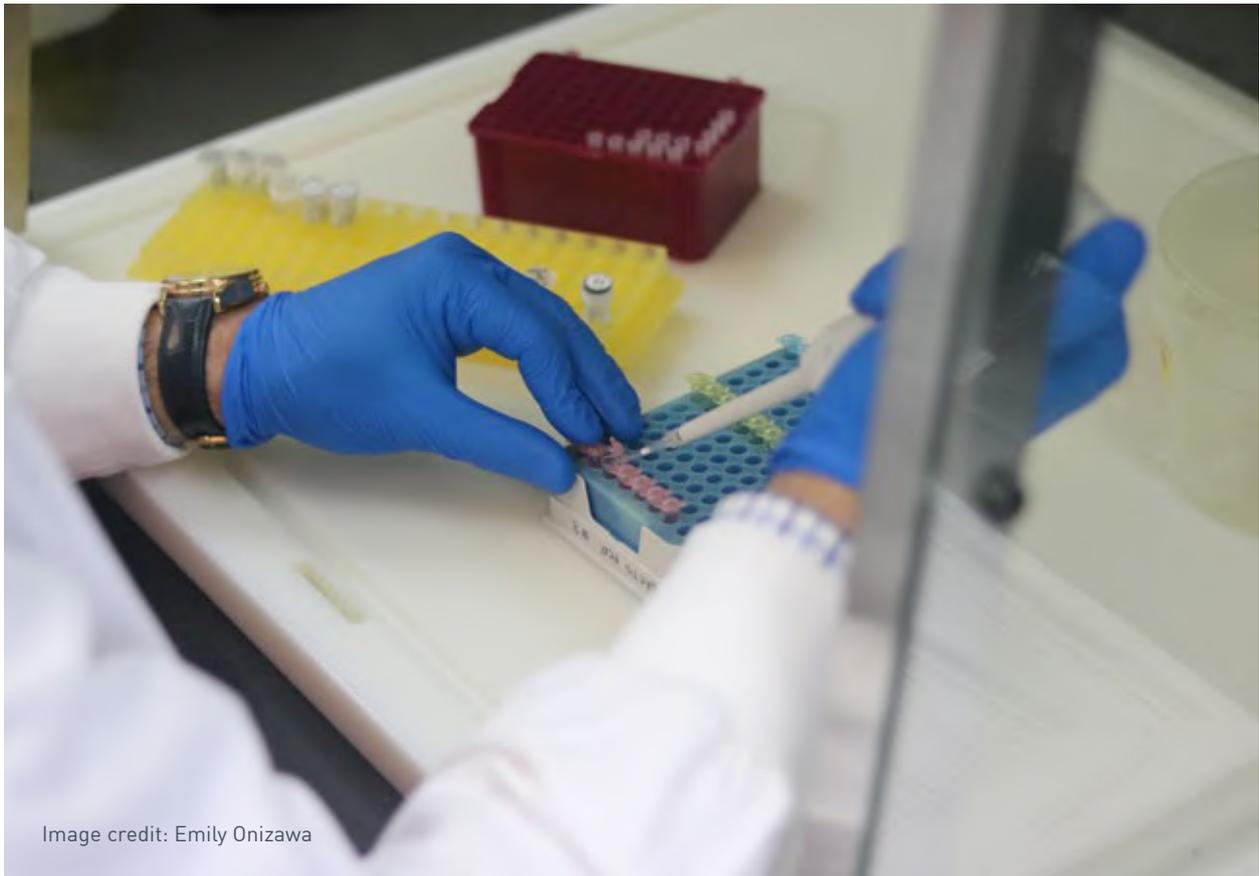


Image credit: Emily Onizawa

laboratories work closely with public health laboratories as required for zoonoses and other veterinary public health issues.

The Australian Veterinary Emergency Plan (AUSVETPLAN) Management Manual: *Laboratory Preparedness*⁸⁸ details the roles of testing laboratories during an EAD response and assists LEADDR and other laboratories in all jurisdictions to prepare for a disease emergency. Under direction from the Consultative Committee on EAD, the LEADDR coordinator or delegate will maintain coordination of available laboratory resources for sample testing and, if necessary, of laboratory supplies, to ensure the effective use of laboratory resources for surge capacity and biosecurity of testing laboratories.

Non-government laboratories

Universities

There are seven Australian universities that have veterinary schools as outlined in Section 1.6. Although veterinary schools operate as independent

entities, they are important to the national animal health system.

Each veterinary school has its own diagnostic laboratory and experts to support its diagnostic, teaching and research activities. These experts cover a broad range of animal health laboratory specialties, including pathology, molecular biology, virology, bacteriology, mycology, parasitology and immunology. Collectively they represent the major national repository of veterinary-trained laboratory diagnosticians.

While veterinary schools generally have a diagnostic and research focus on endemic animal health matters, some of their experts have involvement in specific EAD-related activities through consultancies and research collaboration. Some veterinary schools provide laboratory screening services for specific national animal disease surveillance programs. Several university veterinary laboratory diagnosticians provide expert advice or training to government and industry on major animal health issues.

88 www.animalhealthaustralia.com.au/our-publications/ausvetplan-manuals-and-documents

Private and industry-based laboratories

In Australia, private veterinary laboratories also provide animal health testing and diagnostic services. The government of South Australia has outsourced government veterinary diagnostic services to the private sector through contract. Private laboratories that have appropriate QA programs and government approval may offer official testing services, including those for international trade purposes. Some private laboratories also provide training opportunities for veterinarians to pursue specialist diagnostician qualifications, especially in pathology.

Industry-owned veterinary testing laboratories can be found in some vertically integrated companies, especially in intensive livestock industries. These laboratories provide diagnostic services for the companies and their contractors.

International coordination

Australia's World Organisation for Animal Health (OIE) National Focal Point for Veterinary Laboratories, based in the Department of Agriculture, Water and the Environment, supports Australia's OIE Delegate on various regional and international laboratory issues, including laboratory

Table 5.1 Reference laboratories and collaborating centres in Australia

Expertise	Organisation
Infection with abalone herpesvirus	CSIRO – ACDP (3)
African swine fever	CSIRO – ACDP (3)
Anthrax	Agriculture Victoria, Department of Jobs, Precincts and Regions (DJPR) (1)
Highly pathogenic avian influenza and low pathogenic avian influenza (poultry)	CSIRO – ACDP (3)
Bluetongue	CSIRO – ACDP (3)
Bovine viral diarrhoea	Elizabeth Macarthur Agricultural Institute (2)
Brucellosis	CSIRO – ACDP (1)
Classical swine fever	CSIRO – ACDP (3)
Diagnostic test validation science in Asia-Pacific region	CSIRO – ACDP (4)
Epizootic haematopoietic necrosis	CSIRO – ACDP and University of Sydney (3)
Hendra and Nipah virus diseases	CSIRO – ACDP (3)
Johne's disease	DJPR and University of Melbourne (1)
Laboratory biological risk management	CSIRO – ACDP (5)
Laboratory capacity building	CSIRO – ACDP (4)
Leptospirosis	Queensland Health Forensic Scientific Services (2)
New and emerging diseases	CSIRO – ACDP (4)
Newcastle disease	CSIRO – ACDP (3 & 5)
Rabies	CSIRO – ACDP (1)
Infection with ranavirus	CSIRO – ACDP and University of Sydney (3)
Yellow head disease	CSIRO – ACDP (3)

Status: (1) National Reference Laboratory; (2) OIE Reference Laboratory; (3) National and OIE Reference Laboratory; (4) OIE-designated Collaborating Centre; (5) FAO-designated Reference Centre

capacity-building for disease emergencies and the preparation of commentary on all relevant OIE laboratory standards and guidelines.

The current national and international reference laboratories and collaborating centres are summarised in Table 5.1.

5.2 Quality assurance

Laboratory standards and accreditation

ACDP and all state and territory government animal health laboratories are accredited by NATA⁸⁹ against ISO/IEC 17025:2017 to perform a range of animal health testing services, including those for trade and public health purposes. Many major private or industry-based animal health laboratories in Australia are also accredited by NATA for their relevant scope of testing services. Maintaining appropriate NATA accreditation is important to official testing. NATA is a member of International Laboratory Accreditation Cooperation.

Standard diagnostic procedures

For official testing purposes, Australian laboratories generally adhere to the testing methods recommended by OIE aquatic and terrestrial diagnostic manuals. Diagnostic experts from ACDP and some government and university laboratories contribute to the development or revision of chapters of these manuals regularly and as required.

Australian and New Zealand laboratories have collaborated to produce and maintain a comprehensive series of Australian and New Zealand Standard Diagnostic Procedures (ANZSDPs)⁹⁰ for major aquatic and terrestrial EADs. The series aims to standardise testing procedures for consistency between laboratories and to facilitate PT programs in Australia and New Zealand. The series also reflects specific regulatory or disease-management needs in Australia or New Zealand where corresponding chapters of the OIE diagnostic manual and other international standard procedures do not meet these requirements.

89 www.nata.com.au/nata

90 www.agriculture.gov.au/animal/health/laboratories/procedures/anzsdp

The coordination of ANZSDP activities has been undertaken by SCAHLS under AHC. Many of the standard procedures originally published in 1993 as Australian Standard Diagnostic Techniques have been gradually revised and published as ANZSDPs over the years. To date, more than 40 revised and new editions for terrestrial and aquatic EADs have been published on the SCAHLS website. In 2019, LEADDR also developed the first national guidelines for animal health laboratories preparing for implementation of next generation sequencing for use in animal disease investigations in Australia.

New test evaluation

SCAHLs has the role of evaluating new or modified testing methods through a peer-review process before approval by AHC. Once approved by AHC, testing methods are included in the relevant ANZSDP and/or listed on the SCAHLS website. SCAHLS has published new test-evaluation policy, requirements and process, including specific test-validation templates, to facilitate applications. New validation templates for serological and nucleic acid detection tests have recently been updated to improve ease of use.

Proficiency testing

Proficiency testing (PT) is an effective external QA practice commonly used by Australian laboratories to demonstrate their relevant testing competency, especially for accreditation purposes. The Australian National Quality Assurance Program (ANQAP), which is managed by Agriculture Victoria (Department of Jobs, Precincts and Regions) through a fee-for-service system, is an international PT provider accredited by NATA in line with ISO/IEC 17043:2010 standards. ANQAP provides a number of PT programs to support continuous improvement of individual Australian laboratory testing performance, including some LEADDR network tests. These programs cover serology, virology, bacteriology and molecular diagnostics (mainly polymerase chain reaction testing).

ACDP, which is also accredited by NATA to ISO/IEC 17043:2010 standards, is another major PT provider in Australia and the region. ACDP supports LEADDR PT programs for targeted EADs, mainly in serology and gene-based diagnostics.

The Australian Animal Pathology Standards

Laboratory proficiency testing

Participation in proficiency testing (PT) provides an objective means of assessing and demonstrating the reliability of test results produced through inter-laboratory comparison. ANQAP was instigated by AHC in 1990 and has since been managed as an independent unit by Agriculture Victoria (Department of Jobs, Precincts and Regions). The primary aim of the initial program was to standardise serological testing for a number of major livestock diseases in Australian and New Zealand government laboratories, under SCAHLS's strategic oversight.

Over the years ANQAP has evolved in aim and scope. To date, ANQAP not only provides PT programs covering serology, virology, bacteriology and molecular diagnostics (mainly polymerase chain reaction assays), but it also targets a range of endemic diseases and EADs of different animal species – more recently, various national PT programs for plant diseases. In this regard, ANQAP also supports some PT programs for LEADDR network tests.

Participating in PT programs serves as an important external QA activity for laboratory accreditation purposes, and the successful growth of ANQAP has also seen its PT programs extended internationally through its fee-for-service system. There are now more than 30 laboratories in Australia, New Zealand and North America that benefit regularly from ANQAP's various PT programs. Sourcing appropriate panel samples often presents a challenge to many PT providers, and ANQAP is no exception. In this regard, SCAHLS not only provides strategic direction to ANQAP, but also continually supports its PT programs through sourcing panel samples as needed. This collaboration has proved successful.



Image credit: Getty Images

Participation in proficiency testing provides an objective means of assessing and demonstrating the reliability of test results produced through inter-laboratory comparison.

Program (AAPSP) is a national joint initiative under the management of AHA with support from governments, industry and professional organisations. It aims to improve QA in veterinary pathology by developing and delivering PT programs, a registry of national digital reference materials, and ongoing professional development programs. State and territory government and private laboratories participate in a quarterly histopathology PT program, which was launched in 2006.

In addition, some animal health laboratories are involved in international PT programs run by independent private companies, especially concerning conventional microbiological methods.

Laboratory diagnostician training

In Australia, universities, government and private diagnostic services, and professional bodies and networks play a major role in providing scientific and technical training opportunities to laboratory diagnosticians. Some training activities may support individuals to gain recognisable laboratory specialisations through professional bodies such as the Australian and New Zealand College of Veterinary Scientists and overseas equivalents.

The Australian Association of Veterinary Laboratory Diagnosticians, the Australian Society for Veterinary Pathology, the Australian Society for Microbiology, and AAPSP provide regular training programs, especially through scientific conferences and workshops. These programs cover a range of contemporary topics, including EADs and new methods or technologies. The AAPSP Digital Slide Archive, which represents cases of endemic and exotic diseases in many terrestrial and aquatic animal species, holds thousands of histopathological slides and gross images suitable for online training and education. Some of the jurisdictional laboratories also conduct and/or participate in interactive pathology case studies via the internet, and make relevant materials available online for training purposes.

SCAHLs has an ongoing role in facilitating training. In 2019, an incubator model that aims to train more veterinary pathologists through partnerships between university pathology residency programs and state animal health laboratories was conceived under SCAHLs, and is operational as at 2020.

5.3 Biosafety and biosecurity

Standards and practice

Biosafety and biosecurity practice for the storage and handling of materials containing infectious microorganisms in laboratory facilities in Australia is generally based on relevant standards and guidelines developed by international and/or national bodies (e.g. ISO/IEC, Standards Australia and the World Health Organization). Australia/New Zealand Standard (AS/NZS) 2243.3 is a national standard for the control and containment of microorganisms, good laboratory practices, work health and safety of laboratory personnel, and design of biocontainment facilities. It supports the development of regulatory requirements and certification guidelines.

Laboratories that handle living modified organisms and security-sensitive biological agents must be certified by the Office of the Gene Technology Regulator and the Security-Sensitive Biological Agents Regulatory Scheme respectively. These facilities are under the portfolio of the Australian Government Department of Health. The Department of Agriculture, Water and the Environment also operates a regulatory scheme under the *Biosecurity Act 2015* (Cwlth) for a range of biological agents.

AHC, especially through support by SCAHLs and LEADDR, provides national leadership to strengthen biosafety and biosecurity practices in animal health laboratories in Australia. All government animal health laboratories have standard operating procedures for biosafety and biosecurity, including decontamination plans, in place.

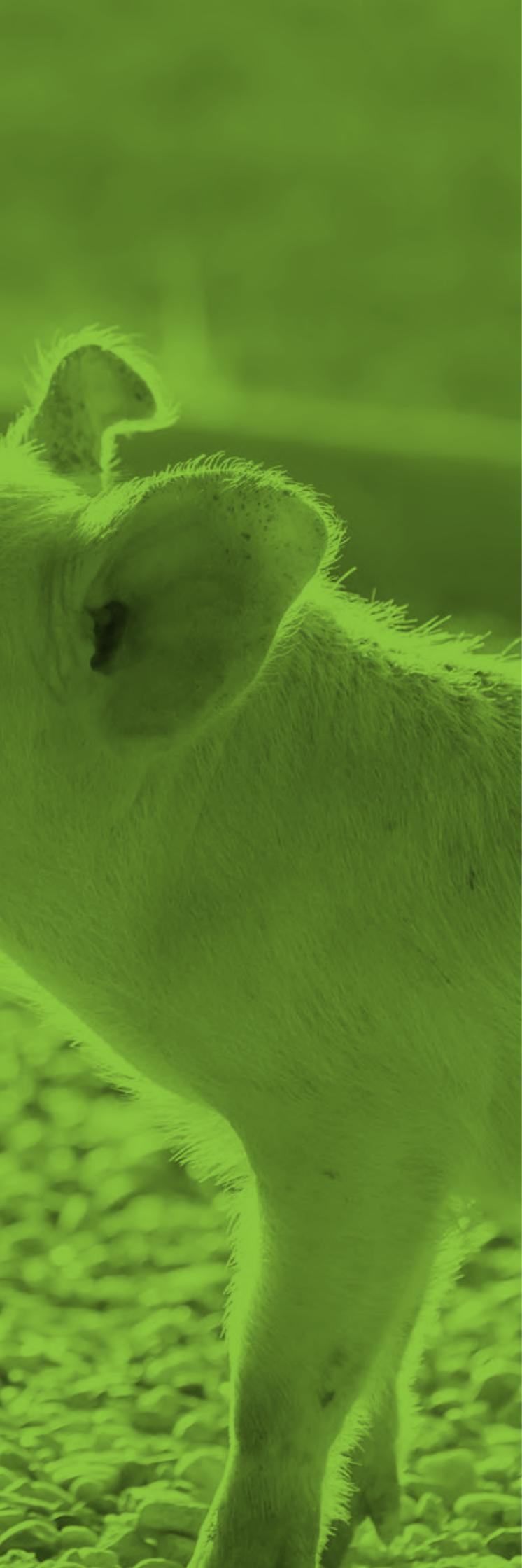
Biocontainment facilities

ACDP is one of only six high-containment animal research centres in the world. It has facilities up to physical containment (PC) level 4 (i.e. the maximum level) suitable for both laboratory testing and animal studies, including for EADs that could threaten Australia's animal industries and/or public health. All state and territory government laboratories have certified PC2- or PC3-level facilities adequate for their testing and research purposes. The Elizabeth Macarthur Agricultural Institute in New South Wales also has a PC3-level animal facility suitable for investigational study.

A close-up photograph of a person's hand gently petting the head of a pig. The pig is lying down in a field of green, leafy plants. The entire image is overlaid with a semi-transparent green filter. The background is a soft-focus field of green plants.

6

Animal welfare



6.1 Australia's animal welfare system

The roles and responsibilities of government

Australia has a collaborative approach to managing animal health and welfare. Animal welfare oversight in Australia involves the Australian Government, state and territory (that is, sub-national region) governments, industry and veterinarians.

Australia's three tiers of government each have animal welfare responsibilities.

- The Australian Government's responsibilities for animal welfare relate to external trade and treaties that encompass some animal welfare issues. The Australian Government also administers a regulatory framework designed to minimise the risk of adverse animal welfare outcomes for exported livestock, including through to the point of slaughter for non-breeding animals.
- State and territory governments have primary responsibility for animal welfare within Australia. This includes preparing and enforcing animal welfare legislation, providing suitable institutional and legislative frameworks, developing appropriate policies and programs, and promoting and making these readily accessible to the public.
- Local governments have responsibility for some areas of domestic animal control and public health that have a significant impact on animal welfare. This includes providing feedback to state and territory governments on animal welfare legislation and for the promotion and maintenance of responsible animal ownership.

Since the 1980s, the welfare of livestock in Australia has been supported by a series of Model Codes of Practice for the Welfare of Animals (MCOP), which were adopted voluntarily by animal industry sectors.

A review of MCOP in 2005 recommended that the codes be converted into Australian Animal Welfare Standards and Guidelines, with the standards to be adopted as minimum legal standards by Australian states and territories, and the guidelines for best practice to be adopted voluntarily by industry.

The introduction of animal welfare standards and guidelines for livestock aimed to improve livestock welfare regulation in Australia through a greater focus on improved welfare outcomes, practical implementation for industry, and consistency across all Australian jurisdictions.

The development of Australian Animal Welfare Standards and Guidelines is overseen by the Animal Welfare Task Group, a committee comprised of officials from the Australian, state, territory and New Zealand governments. Progress with developing Australian Animal Welfare Standards and Guidelines is available online.⁹¹

The roles and responsibilities of industry

Livestock industries work collaboratively with governments and various other stakeholders to deliver optimal animal welfare outcomes in international trade, the domestic market, on-farm, and all aspects of the supply chain.

Industry's roles and responsibilities for animal welfare span several areas:

- Industry provides a high standard of livestock welfare by ensuring that animals are treated in accordance with animal welfare legislation, best practice guidelines, and the provisions outlined in animal welfare framework models such as Five Freedoms and Five Domains.
- Industry is integral to ensuring that the Australian Animal Welfare Standards and Guidelines and other jurisdictional animal welfare legislation are adhered to and implemented on-farm. As part of this, industries have developed their own animal welfare best practice guidelines, certification systems and quality assurance systems, which align with legislative requirements and report on animal welfare practices to ensure compliance. These systems are regularly

updated to reflect legislative changes and advances in animal welfare science.

- Industry co-invests in, supports and informs the direction of animal welfare research, development and extension (RD&E). Investments in animal welfare RD&E provide industry with the information and tools to support practice change and to ensure continuous improvements in animal welfare. RD&E enables industry to develop and promote animal welfare resources for farmers, as well as contributing to the provision of animal welfare education and training throughout Australia. Specific industry animal welfare initiatives and projects will be referred to in the *Animal Health in Australia Annual Report*.
- Industry representative bodies take leading roles in developing national animal welfare policy and standards, educating the community about farm animal welfare and engaging with producers to ensure good welfare outcomes on-farm and through the supply chain.

Good animal welfare is supported by knowledge and skilled management in the prevention of disease and injury, veterinary treatment, appropriate shelter, nutrition, and recognised Australian industry best practice for handling, transport, slaughter and euthanasia. Some animal industries have demonstrated their commitment to animal welfare by developing animal welfare policy and position statements.

Investments in animal welfare RD&E provide industry with the information and tools to support practice change and to ensure continuous improvements in animal welfare.

⁹¹ www.animalwelfarestandards.net.au

Australia's three tiers of government each have animal welfare responsibilities.

The Australian Government

The Australian Government's responsibilities for animal welfare relate to external trade and treaties that encompass some animal welfare issues. The Australian Government also administers a regulatory framework designed to minimise the risk of adverse animal welfare outcomes for exported livestock, including through to the point of slaughter for non-breeding animals.

State and territory governments

State and territory governments have primary responsibility for animal welfare within Australia. This includes preparing and enforcing animal welfare legislation, providing suitable institutional and legislative frameworks, developing appropriate policies and programs, and promoting and making these readily accessible to the public.

Local governments

Local governments have responsibility for some areas of domestic animal control and public health that have a significant impact on animal welfare. This includes providing feedback to state and territory governments on animal welfare legislation and for the promotion and maintenance of responsible animal ownership.



Image credit: Animal Health Australia

Reporting animal welfare outcomes in Australia

Australian farmers and farming businesses have earned a reputation for high standards in animal treatment. Success of the Australian agriculture industry would be impossible without their commitment to high-level animal welfare outcomes, and their focus is validated and supported by the following reporting systems:

- Legislation requires that a sea voyage livestock mortality report is tabled in the Australian Parliament every six months. These reports are available online.⁹²

⁹² www.agriculture.gov.au/export/controlled-goods/live-animals/live-animal-export-statistics/reports-to-parliament

- Australian Animal Welfare Standards and Guidelines are available online.⁹³

The Australian Government also maintains awareness of consumer trends and global developments to prepare for and respond to animal welfare concerns that may affect agriculture and international trade.

To help inform animal welfare policy, the then Department of Agriculture and Water Resources (now the Department of Agriculture, Water and the Environment) commissioned Futureye Pty Ltd to evaluate public opinion on farm animal welfare.

⁹³ www.animalwelfarestandards.net.au

Table 6.1 Overarching principles for a framework for farm animal welfare governance

Consistent	Effective	Trusted
<p>National consistency to provide certainty to industry and consumers</p>	<p>Ensures good animal welfare outcomes</p>	<p>Trusted by the community, consumers, industry and trading partners</p>
<p>The three overarching principles can be achieved if the improved national governance model meets six key requirements:</p> <ol style="list-style-type: none"> 1. Independence from specific political and stakeholder interests 2. Capable governance and expertise 3. Consideration of contemporary animal welfare science, costs to industry, practicalities, community standards and international expectations 4. Transparent policies and processes 5. Rapid and consistent implementation of standards in all state and territory jurisdictions 6. Accountable compliance and enforcement by state and territory authorities 		

- The resulting report, *Australia’s Shifting Mindset on Farm Animal Welfare*, was published in February 2019.⁹⁴
- The research found a high level of community concern about farm animal welfare.

Improving animal welfare regulation in Australia

In early 2019, agriculture ministers from the Australian Government and all state and territory governments agreed to explore options for improving national governance of farm animal welfare.

In collaboration with state and territory departments, then Department of Agriculture and Water Resources consulted with stakeholder groups—including industry organisations, rural research and development corporations and animal welfare groups—seeking feedback on ways to improve the animal welfare system. This consultation found that improvements could be made by developing and implementing Australian Animal Welfare Standards and Guidelines in a more timely and consistent way.

At the Agriculture Ministers’ Forum on 25 October 2019, ministers agreed to a set of overarching principles and key requirements for a future new national governance framework for farm animal welfare, as outlined in Table 6.1.

Ministers also decided for the first time to use an independent panel to finalise development of *Australian Animal Welfare Standards and Guidelines for Poultry*. This process will serve as a trial for a new approach to developing standards and guidelines in line with the new principles and requirements.

⁹⁴ www.agriculture.gov.au/animal/welfare/animal-welfare-in-australia#research-and-development



7

One Health

The One Health concept acknowledges that the health of people, animals and the environment in which they live is interconnected.



The goal of One Health is to encourage communication and collaboration between multiple disciplines to improve health outcomes for people, animals and the environment. A One Health approach is critical for responding to the increasing global threat of antimicrobial resistance (AMR) and emerging zoonotic diseases, with approximately 70% of emerging infectious diseases in humans originating from animals. The current SARS-CoV-2 pandemic (COVID-19 disease) provides an alert about strengthening global One Health systems to reduce the risk of zoonotic pandemics.

7.1 Antimicrobial resistance

Australia has one of the world's most conservative approaches to antimicrobial use in animals, and in 2015 was ranked as the fifth-lowest user of antibiotics in agriculture from the United Kingdom *Review on Antimicrobial Resistance*.⁹⁵ The risk of the development of AMR from animals in Australia is

⁹⁵ <https://amr-review.org>

also considered to be low due to factors such as strict regulation with antimicrobials, low levels of antimicrobial use in food-producing animals, high levels of biosecurity and extensive farming systems that do not favour bacterial disease.

Australia has no currently registered antimicrobial agents that are medically important for human health with growth promotion claims. Most antimicrobials used in animals are prescription only, and must undergo a rigorous evaluation process by the Australian Pesticides and Veterinary Medicines Authority, which includes an AMR risk assessment.

Australia's AMR activities in the animal sector have been guided by *Australia's First National Antimicrobial Resistance Strategy (2015–2019)*,⁹⁶ with seven strategic objectives coordinating Australia's response to the threat of AMR.

*Australia's National Antimicrobial Resistance Strategy – 2020 and Beyond*⁹⁷ (the second strategy) was released in March 2020. This strategy builds on the achievements of the first, and was developed in collaboration with stakeholders from animal health, agriculture, health, food and environment sectors. By expanding its scope to include all relevant sectors, and with a greater focus on a broad range of antimicrobials,⁹⁸ the second strategy aims to address the global threat of AMR through a genuine One Health approach. The Department of Agriculture, Water and the Environment and the Department of Health are now working together to produce a coordinated One Health master action plan to implement the second strategy's seven key objectives, those being governance, infection prevention and control, communication and engagement, antimicrobial stewardship, AMR surveillance, research and global partnerships.

Guided by the national AMR strategy, Australia's food-producing animal industries are taking a proactive approach to antimicrobial stewardship (AMS) by raising industry awareness and supporting the development of best-practice prescribing guidelines and AMS industry programs.

⁹⁶ www.amr.gov.au/australias-response/national-amr-strategy

⁹⁷ www.amr.gov.au/resources/australias-national-antimicrobial-resistance-strategy-2020-and-beyond

⁹⁸ Antimicrobials include antibiotics, antiseptics, antifungals, antivirals, antimalarials and anthelmintics.

Australia's food-producing animal industries are taking a proactive approach to antimicrobial stewardship by raising industry awareness and supporting the development of best-practice prescribing guidelines...

The Department of Agriculture, Water and the Environment actively contributes to national and international efforts to minimise the development and spread of AMR:

- The Antimicrobial Resistance Governance Group (ARGG) provides leadership on AMR issues and oversees progress of the national AMR strategy.
- The Australian Strategic and Technical Advisory Group on AMR is an expert multi-sectoral group that provides technical, scientific and clinical advice to ARGG to assist the development and implementation of the national AMR strategy.
- The Quadrilateral Animal Health AMR Network comprises AMR representatives from Australia, Canada, New Zealand and the United States and shares information about tackling AMR.
- The Codex Ad Hoc Intergovernmental Task Force on AMR has Australian delegation involvement through electronic working groups and international meetings for the *Code of Practice to Minimize and Contain Foodborne AMR* and draft *Guidelines on Integrated Monitoring and Surveillance of Foodborne AMR*.

7.2 Public health surveillance for zoonotic diseases

Australia's animal and public health agencies have well-established systems to manage zoonotic diseases. Nationally notifiable zoonotic animal diseases must be reported to a veterinarian or jurisdictional agricultural authority if suspected or confirmed. Relevant health authorities are also notified by the state or territory government through existing systems.

The Department of Health and the Department of Agriculture, Water and the Environment work together to manage zoonotic and foodborne diseases that impact human health, and have formal structures in place for One Health collaboration, including:

- A memorandum of understanding to provide national support for emerging and zoonotic disease management, and involvement, as required.
- The Communicable Diseases Network Australia (CDNA),⁹⁹ which provides national leadership and coordination for the surveillance of communicable diseases, including zoonotic disease. The network also oversees the development of national public health guidelines for communicable disease outbreak responses. CDNA has face-to-face meetings and fortnightly teleconferences facilitating information-sharing between members, which include representatives from the Department of Health and the Department of Agriculture, Water and the Environment, state and territory governments, and key non-government organisations concerned with communicable diseases.
- The National Notifiable Diseases Surveillance System (NNDSS) coordinates the surveillance of over 50 communicable diseases of public health concern. Human cases of selected communicable disease are notified to the state or territory health authority, and the Department of Health is supplied with de-identified information for analysis. This

⁹⁹ www1.health.gov.au/internet/main/publishing.nsf/Content/cda-cdna-index.htm



(Image credit: Guy Weerasinghe)

information is updated daily on the NNDSS website,¹⁰⁰ and is published quarterly in the online journal *Communicable Diseases Intelligence*.¹⁰¹ Human disease notifications of five important zoonoses (brucellosis, chlamydia, leptospirosis, listeriosis and Q fever) are also presented in the *Animal Health Surveillance Quarterly*.¹⁰²

- The *National Action Plan for Health Security 2019–2023* (NAPHS)¹⁰³ has been developed to address key recommendations arising from Australia's Joint External Evaluation (JEE) of the *International Health Regulations (2005)*.¹⁰⁴ NAPHS identifies priorities for One Health collaboration, and provides a framework to track the implementation of JEE recommendations. The goal is to ensure that Australia is fully prepared to respond to any acute public health event. Several NAPHS activities are already underway or completed, including a cross-sectoral workshop to identify priority zoonotic diseases for One Health collaboration (June 2019).

¹⁰⁰ www9.health.gov.au/cda/source/cda-index.cfm

¹⁰¹ www1.health.gov.au/internet/main/publishing.nsf/Content/cda-pubs-cdi-cdiintro.htm

¹⁰² www.animalhealthaustralia.com.au/our-publications/animal-health-surveillance-quarterly

¹⁰³ www.who.int/ihr/procedures/health-security-national-action-plan/en

¹⁰⁴ www1.health.gov.au/internet/main/publishing.nsf/Content/ohp-biosecc-JEE.htm



Appendices



APPENDIX A

RESEARCH AND DEVELOPMENT CORPORATIONS

There are 15 Rural Research and Development Corporations (RDCs) in Australia, including six plant-based, seven animal-based, one aquatic-based and one cross-sectoral organisation (AgriFutures). RDCs drive industry improvements through making strategic investments in priority research, development and extension (RD&E) with a mixture of farmer levies and Australian Government funding.

Table A1 Research and Development Corporation contact information

RDC	Description	Contact information
Australian Eggs	Australian Eggs Limited is a member-owned, not-for-profit company providing marketing and research and development services to benefit Australian egg farmers. Australian Eggs Limited invests directly with universities and CSIRO in projects and activities that affect not only the overall health of the laying flock, but also biosecurity and the welfare of the bird.	E: contacts@australianeggs.org.au W: www.australianeggs.org.au
Australian Pork Limited	Australian Pork Limited is the rural service body for the Australian pork industry. The pork industry funds a number of initiatives and projects in the areas of animal health and welfare.	E: apl@australianpork.com.au W: www.pork.com.au
Australian Wool Innovation	Australian Wool Innovation Limited (AWI) invests in research and development (R&D), marketing and promotion to enhance the profitability, international competitiveness and sustainability of the Australian wool industry, and to increase the demand and market access for Australian wool. AWI invests in projects to improve sheep health and welfare, including post-farmgate EAD preparedness.	E: info@wool.com W: www.wool.com
Dairy Australia	Dairy Australia Limited is the national service body for the Australian dairy industry, supporting dairy farmers to produce a high-quality product from healthy and productive animals. Dairy Australia Limited does this by investing in RD&E projects in alignment with Dairy Moving Forward priorities.	E: enquiries@dairyaustralia.com.au W: www.dairyaustralia.com.au

Cont'd

RDC	Description	Contact information
LiveCorp	The Australian Livestock Export Corporation (LiveCorp) channels most of its research funding through the Livestock Export Program (LEP), which is jointly funded with Meat & Livestock Australia (MLA). The LEP RD&E Program allocates around three-quarters of its budget to improving animal health and welfare outcomes across the supply chain.	E: livecorp@livecorp.com.au W: www.livecorp.com.au/researchdevelopment/about-r-d
Meat and Livestock Australia	Meat and Livestock Australia invests red meat producer levies in research, development and adoption to improve livestock wellbeing, and the profitability and sustainability of the beef cattle, sheep and goat industries.	E: info@mla.com.au W: www.mla.com.au
AgriFutures Australia	AgriFutures Australia collaborates with industry and government by investing in R&D, which contributes to the productivity, profitability and sustainability of rural industries. AgriFutures Australia makes strategic investments in People and Leadership, National Challenges and Opportunities, Growing Profitability and Emerging Industries.	E: info@agrifutures.com.au W: www.agrifutures.com.au
Australian Meat Processor Corporation	Australian Meat Processor Corporation (AMPC) is the RDC for the red meat processing sector. AMPC commissions research in the areas of automation, meat science and food safety, market access, animal welfare and many other areas of significance to members.	E: admin@ampc.com.au W: www.ampc.com.au
Fisheries Research and Development Corporation	Fisheries Research and Development Corporation leads national R&D infrastructure addressing whole-of-industry and community priorities, including sustainable fishing, improved productivity and profitability, and development of new and emerging aquaculture opportunities.	E: frdc@frdc.com.au W: www.frdc.com.au

APPENDIX B

KEY ANIMAL HEALTH WEBSITES

Accreditation Program for Australian Veterinarians	www.animalhealthaustralia.com.au/training/veterinary-training/accreditation-program-for-australian-veterinarians-apav
AgriFutures Australia	www.agrifutures.com.au
Animal Health Australia	www.animalhealthaustralia.com.au
Animal Health Surveillance Quarterly	www.animalhealthaustralia.com.au/our-publications/animal-health-surveillance-quarterly
Animal Research Centre, University of the Sunshine Coast	www.usc.edu.au/research/animal-and-marine-ecology
AQUAPLAN	www.agriculture.gov.au/animal/aquatic/aquaplan
AQUAVETPLAN	www.agriculture.gov.au/animal/aquatic/aquavetplan
AUS-MEAT Limited	www.ausmeat.com.au
Australasian Veterinary Boards Council	www.avbc.asn.au
Australia's animal health laboratory network	www.agriculture.gov.au/animal/health/system/lab-network
Australian Alpaca Association	www.alpaca.asn.au
Australian and New Zealand College of Veterinary Scientists	www.anzcvs.org.au
Australian Centre for International Agricultural Research	www.aciar.gov.au
Australian Chicken Meat Federation	www.chicken.org.au
Australian Chief Veterinary Officer	www.agriculture.gov.au/animal/health/acvo
Australian Dairy Farmers	australiandairyfarmers.com.au
Australian Eggs Limited	www.australianeggs.org.au
Australian Food & Grocery Council	www.afgc.org.au
Australian Government Department of Agriculture, Water and the Environment	www.agriculture.gov.au
Australian Government Department of Foreign Affairs and Trade Overseas Aid Program (Australian Aid)	www.dfat.gov.au/aid
Australian Government Department of Health	www.health.gov.au

Cont'd

Australian Government Department of Home Affairs	www.homeaffairs.gov.au
Australian Government Indo-Pacific Centre for Health Security	www.indopacifichealthsecurity.dfat.gov.au
Australian Harness Racing	www.harness.org.au
Australian Honey Bee Industry Council	www.honeybee.org.au
Australian Horse Industry Council	www.horsecouncil.org.au
Australian Live Exporters' Council	www.auslivestockexport.com
Australian Lot Feeders' Association	www.feedlots.com.au
Australian Meat Industry Council	www.amic.org.au
Australian Meat Processor Corporation	www.ampc.com.au
Australian National Quality Assurance Program	www.anqap.com
Australian Pesticides and Veterinary Medicines Authority	www.apvma.gov.au
Australian Pork Limited	www.australianpork.com.au
Australian Q Fever Register	www.qfever.org
Australian Veterinary Association	www.ava.com.au
Australian Wool Innovation Limited	www.wool.com
AUSVETPLAN	www.animalhealthaustralia.com.au/our-publications/ausvetplan-manuals-and-documents
BeeAware	www.beeaware.org.au
Biosecurity in Australia	www.agriculture.gov.au/biosecurity/australia
Biosecurity risk analysis	www.agriculture.gov.au/biosecurity/risk-analysis
Cattle Council of Australia	www.cattlecouncil.com.au
Centre of Excellence for Biosecurity Risk Analysis	www.cebra.unimelb.edu.au
Chief Environmental Biosecurity Officer	www.agriculture.gov.au/biosecurity/environmental/cebo
College of Public Health, Medical and Veterinary Sciences, James Cook University	www.jcu.edu.au/college-of-public-health-medical-and-veterinary-sciences
Cooperative Research Centre for High Integrity Australian Pork	www.porkcrc.com.au
Cooperative Research Centre for Sheep Industry Innovation	www.sheepcrc.org.au
CSIRO Australian Centre for Disease Preparedness	www.csiro.au/en/Research/Facilities/ACDP

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Dairy Australia Limited	www.dairyaustralia.com.au
Deer Industry Association of Australia	www.deerfarming.com.au
Department of Agriculture and Fisheries, Queensland	www.daf.qld.gov.au
Department of Animal, Plant and Soil Sciences, La Trobe University	www.latrobe.edu.au/animal-plant-and-soil-sciences/about
Department of Industry, Tourism and Trade, Northern Territory	industry.nt.gov.au
Department of Jobs, Precincts and Regions, Victoria	www.agriculture.vic.gov.au
Department of Primary Industries and Regional Development, Western Australia	www.dpir.wa.gov.au
Department of Primary Industries and Regions, South Australia	www.pir.sa.gov.au
Department of Primary Industries, New South Wales	www.dpi.nsw.gov.au
Department of Primary Industries, Parks, Water and Environment, Tasmania	www.dpipwe.tas.gov.au
Egg Farmers of Australia	www.eggfarmersaustralia.org
Elizabeth Macarthur Agricultural Institute	www.dpi.nsw.gov.au/about-us/science-and-research/centres/emai
Emergency Animal Disease Response Agreement	www.animalhealthaustralia.com.au/what-we-do/emergency-animal-disease/ead-response-agreement
Equestrian Australia Limited	www.equestrian.org.au
Faculty of Veterinary and Agricultural Sciences, University of Melbourne	www.fvas.unimelb.edu.au
Farm Biosecurity	www.farmbiosecurity.com.au
Fisheries Research and Development Corporation	www.frdc.com.au
Food Standards Australia New Zealand	www.foodstandards.gov.au
Goat Industry Council of Australia	www.gica.com.au
Intergovernmental Agreement on Biosecurity	www.coag.gov.au/about-coag/agreements/intergovernmental-agreement-biosecurity-0
LiveCorp	www.livecorp.com.au
Meat & Livestock Australia	www.mla.com.au
National Animal Health Information Program	www.animalhealthaustralia.com.au/what-we-do/disease-surveillance/national-animal-health-information-system-nahip

Cont'd

National Arbovirus Monitoring Program	www.animalhealthaustralia.com.au/what-we-do/disease-surveillance/national-arbovirus-monitoring-program
National Farmers' Federation	www.nff.org.au
National Notifiable Diseases Surveillance System	www9.health.gov.au/cda/source/cda-index.cfm
National pest & disease outbreaks	www.outbreak.gov.au
National Primary Industries Research, Development and Extension Framework	www.npirdef.org
National Transmissible Spongiform Encephalopathies Surveillance Project	www.animalhealthaustralia.com.au/what-we-do/disease-surveillance/tse-freedom-assurance-program/surveillance-of-tsese
Nationally Agreed Standard Operating Procedures	www.animalhealthaustralia.com.au/what-we-do/emergency-animal-disease/nationally-agreed-standard-operating-procedures
Poultry Hub	www.poultryhub.org
Racing Australia	racingaustralia.horse
SAFEMEAT	www.safemeat.com.au
School of Animal & Veterinary Sciences, Charles Sturt University	www.csu.edu.au/vet
School of Animal and Veterinary Sciences, University of Adelaide	www.sciences.adelaide.edu.au/animal-veterinary-sciences
School of Environment and Rural Science, University of New England	www.une.edu.au/about-une/faculty-of-science-agriculture-business-and-law/school-of-environmental-and-rural-science
School of Life and Environmental Sciences, Deakin University	www.deakin.edu.au/life-environmental-sciences
School of Veterinary and Life Sciences, Murdoch University	www.murdoch.edu.au/School-of-Veterinary-and-Life-Sciences
School of Veterinary Science, University of Queensland	www.veterinary-science.uq.edu.au
School of Veterinary Science, University of Sydney	www.sydney.edu.au/vetscience
Seafood Standards	www.seafoodstandards.com.au
Sheep Producers Australia	www.sheepproducers.com.au
Stock Feed Manufacturers' Council of Australia	www.sfmca.com.au
Wildlife Health Australia	www.wildlifehealthaustralia.com.au
WoolProducers Australia	www.woolproducers.com.au
Zoo and Aquarium Association	www.zooaquarium.org.au

ACRONYMS AND ABBREVIATIONS

AAPSP	Australian Animal Pathology Standards Program
ACDP	Australian Centre for Disease Preparedness
AGMIN	Agriculture Ministers' Forum
AGSOC	Agriculture Senior Officials' Committee
AHA	Animal Health Australia
AHAP	Abalone Health Accreditation Program
AHBIC	Australian Honey Bee Industry Council
AHC	Animal Health Committee
AI	avian influenza
AIV	avian influenza viruses
ALOP	appropriate level of protection
AMPC	Australian Meat Processor Corporation
AMR	antimicrobial resistance
AMS	antimicrobial stewardship
ANQAP	Australian National Quality Assurance Program
ANZSDP	Australian and New Zealand Standard Diagnostic Procedures
ARGG	Antimicrobial Resistance Governance Group
AVA	Australian Veterinary Association
AWI	Australian Wool Innovation
BBO	Bee Biosecurity Officers
BIRA	Biosecurity Import Risk Analyses
BSE	bovine spongiform encephalopathy
BTV	bluetongue virus
CAE	caprine arthritis–encephalitis
CCEAD	Consultative Committee on Emergency Animal Diseases
CDNA	Communicable Diseases Network Australia
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CVO	Chief Veterinary Officer
DJPR	Department of Jobs, Precincts and Regions

EAD	emergency animal disease
EADRA	Emergency Animal Disease Response Agreement
EADRP	emergency animal disease response plan
EAS	Enhanced Abattoir Surveillance
EBL	enzootic bovine leucosis
EI	equine influenza
ESA	Egg Standards of Australia
EWD	emergency wildlife disease
FMD	foot-and-mouth disease
FRDC	Fisheries Research and Development Corporation
FSANZ	Food Standards Australia New Zealand
HACCP	Hazard Analysis and Critical Control Points
IAHER	International Animal Health Emergency Reserve
JD	Johne's disease
JEV	Japanese encephalitis virus
LEADDR	Laboratories for Emergency Animal Disease Diagnosis and Response
LPA	Livestock Production Assurance
MAP	Market Assurance Program
MCOP	Model Codes of Practice for the Welfare of Animals
MLA	Meat & Livestock Australia
NAHIP	National Animal Health Information Program
NAHIS	National Animal Health Information System
NAMP	National Arbovirus Monitoring Program
NAQS	Northern Australia Quarantine Strategy
NASOP	Nationally Agreed Standard Operating Procedures
NATA	National Association of Testing Authorities, Australia
NBC	National Biosecurity Committee
NBCEN	National Biosecurity Communication and Engagement Network
ND	Newcastle disease
NFAS	National Feedlot Accreditation Scheme
NLIS	National Livestock Identification System
NMG	National Management Group

NNDSS	National Notifiable Diseases Surveillance System
NSDIP	National Significant Disease Investigation Program
NSHMP	National Sheep Health Monitoring Project
NVD	National Vendor Declaration
NWS	New World screw-worm
OIE	World Organisation for Animal Health (Office International des Epizooties)
OWS	Old World screw-worm
PC	physical containment
PetFAST	Pet Food Adverse Event System of Tracking
PFIAA	Pet Food Industry Association of Australia
PHA	Plant Health Australia
PIC	Property Identification Code
PT	proficiency testing
QA	quality assurance
RD&E	research, development and extension
RDC	Research and Development Corporations
RSPCA	Royal Society for the Prevention of Cruelty to Animals
SCAAH	Subcommittee on Aquatic Animal Health
SCAHLs	Subcommittee on Animal Health Laboratory Standards
SE	Salmonella Enteritidis
SHD	Sheep Health Declaration
SPS	Sanitary and Phytosanitary
SWF	screw-worm fly
TB	tuberculosis
TSE	transmissible spongiform encephalopathy
TSEFAP	Transmissible Spongiform Encephalopathy Freedom Assurance Project
VSAAC	Veterinary Schools Accreditation Advisory Committee
VSb	veterinary statutory body
WHA	Wildlife Health Australia
WSSV	white spot syndrome virus

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