ANIMAL HEALTH IN

AUSTRALIA

Annual Report 2022

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Digital version

Please find a digital copy of the *Animal Health in Australia Annual Report 2022*, as well as previous editions, at www.animalhealthaustralia.com.au/ahia.

About this publication

The *Animal Health in Australia Annual Report* covers animal health and related matters that have occurred during the year, including relevant new policies and projects, disease incidents and status, and research activities.

Chapter 1 outlines key achievements, while Chapter 2 highlights the current status of Australia's terrestrial animal health and Chapter 3 the current status of Australia's aquatic animal health.

The report is produced by Animal Health Australia (AHA) and receives input and review from staff at the Australian Government Department of Agriculture, Fisheries and Forestry through the Animal Health Policy Branch (AHPB), Office of the Chief Veterinary Officer (OCVO) and the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES).

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The publication was reviewed by Dr Mark Schipp, Australian Chief Veterinary Officer and Kathleen Plowman, AHA Chief Executive Officer.

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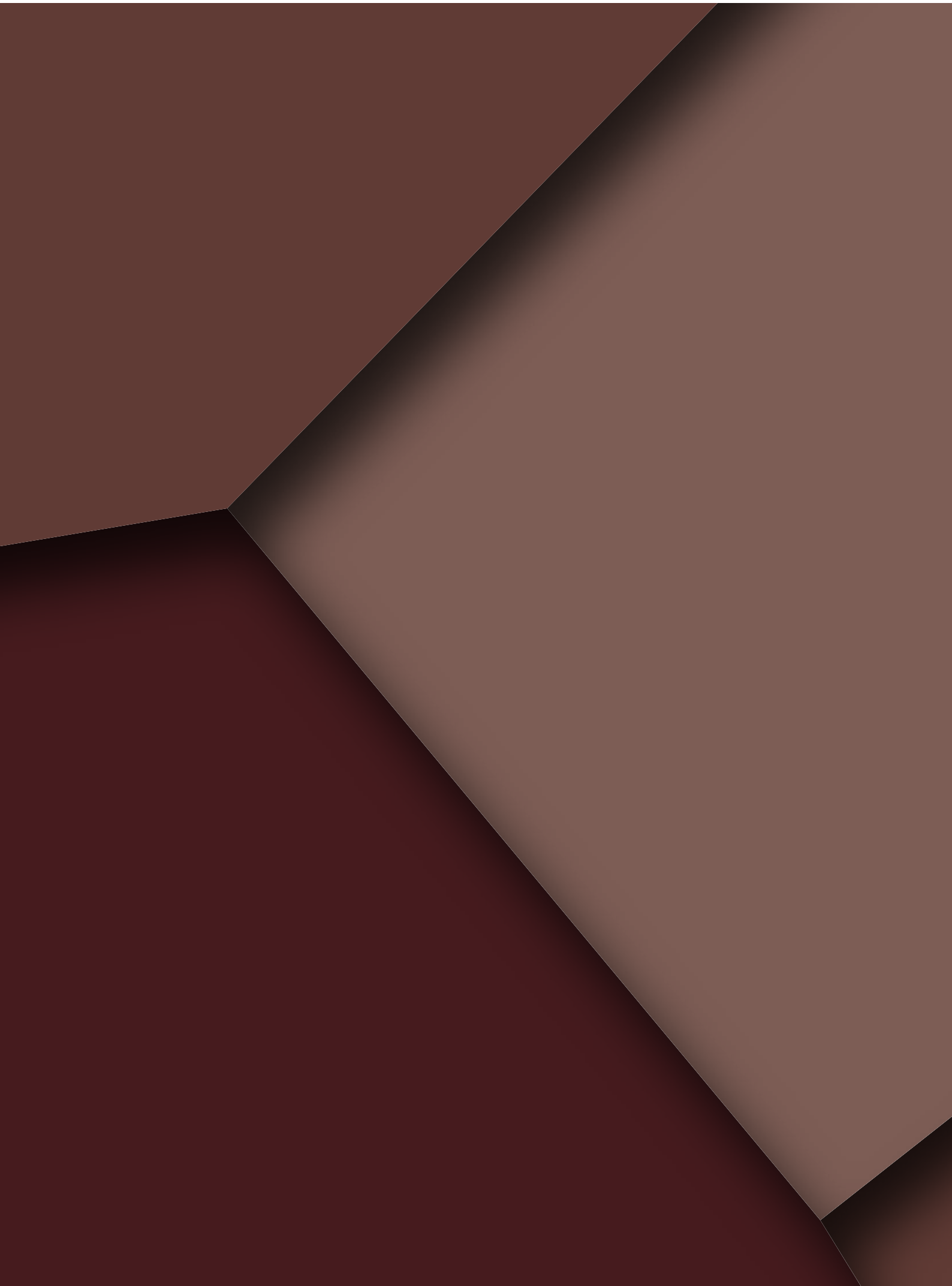


Foreword

Welcome to the latest edition of the *Animal Health in Australia Annual Report*, which outlines key animal health initiatives and developments in 2022, including relevant achievements and disease incidents. This report complements the *Animal Health in Australia System Report* which goes into more detail on our animal health systems and the governance, surveillance, emergency management and animal welfare arrangements that support Australia's unique animal health status.

2022 was an eventful year in animal health and biosecurity, with notable animal disease events occurring in Australia, the Asia-Pacific region and beyond. The dedicated work of our animal health communities has continued to serve and support our primary producers, export industries and the broader Australian community. Australia's response to outbreaks of Japanese encephalitis, *Varroa destructor* and white spot disease during the year is outlined in this report.

In July 2022, Australia's Department of Agriculture, Water and the Environment became known as the Department of Agriculture, Fisheries and Forestry. Water and environment matters were transferred to a newly formed department, while the remaining functions were largely unaffected, including the policies and operation of Australia's animal health system.

The department will continue to roll out important initiatives like the *Commonwealth Biosecurity 2030* strategy, and new action plans for production animal industries (*Animalplan 2022 to 2027*) and aquatic industries (*AQUAPLAN 2022–2027*). These initiatives are helping to bring together industry and government in a collaborative approach to managing our animal health system.

Disease threats in our region have continued to develop. The Minister for Agriculture, Fisheries and Forestry, Senator the Hon. Murray Watt, responded by releasing the National Lumpy Skin Disease Action Plan in October 2022. The plan contains eight objectives and 27 activities to improve Australia's preparedness for a potential incursion of lumpy skin disease. High pathogenicity avian influenza outbreaks caused significant impacts abroad, but this disease remains absent in Australia. Ongoing attention to biosecurity remains critical, and collaboration between industry, government and other sectors is more important than ever as we face this uncertain biosecurity landscape.

International engagement is vital to protecting Australia's animal health status. Dedicated support programs for the Pacific and our northern neighbours decrease the biosecurity pressure on Australia's borders by building capacity in disease detection and response.

Credit: Northern Territory Livestock Exporters Association

Australian Chief Veterinary Officer Dr Mark Schipp in Darwin where he met with Australian animal industry representatives.

This work also deepens our mutually beneficial regional alliances. Likewise, our engagement in international standard-setting supports global disease control and recognition of Australia's practices and disease status. As a reflection of our high standing, I was pleased to welcome the Director General of the World Organisation for Animal Health on her first ever visit to Australia in November 2022.

At home, Australia continued to prioritise One Health collaborations to address emerging challenges. We launched a new One Health surveillance initiative with Wildlife Health Australia and established the Human Animal Spillover and Emerging Diseases Scanning group to scan for new, emerging and re-emerging diseases with potential for human-animal interspecies transfer. At international forums, Australia is leading the push for a true One Health approach to prevent future pandemics and zoonotic spillovers.

It is important that our animal health systems remain resilient and proactive in combating the increased risks of pests and diseases. This report demonstrates the considerable work being done to strengthen our national animal health systems.

These efforts are critical to prevent, prepare and respond to disease outbreaks, uphold animal health and welfare standards, support economic prosperity, and maintain our food security.

As Australia's Chief Veterinary Officer, I am privileged to witness the many activities and programs that contribute to maintaining our robust animal health system. Australia's animal health system is the product of best-practice science, innovation and collaboration and the dedication of many. I sincerely thank all who work to support animal health in Australia.

Dr Mark Schipp
Australian Chief Veterinary Officer

Credit: VVF Goat Advisory Group

1

Key achievements

Animal health status, emergency preparedness and response

The Joint Interagency Taskforce: Exotic Animal Disease Preparedness Report

In August 2022, the Minister for Agriculture, Fisheries and Forestry, Senator the Hon. Murray Watt announced the establishment of a Joint Interagency Taskforce: Exotic Animal Disease Preparedness to review Australia's preparedness for exotic animal diseases. The joint taskforce brought together representatives from the Australian Government Department of Agriculture, Fisheries and Forestry, the Department of Home Affairs (the National Emergency Management Agency and Australian Border Force), the Department of Defence and was supported by Animal Health Australia. The joint taskforce delivered its report to Minister Watt on 5 September 2022. The joint taskforce found that Australia's emergency animal disease system is sound, and its report outlined 14 recommendations to ensure that Australia is better prepared should there be an incursion of an exotic animal disease such as foot and mouth disease or lumpy skin disease. The Department of Agriculture, Fisheries and Forestry is now actioning the recommendations in the report.

Read the report:
agriculture.gov.au/biosecurity-trade/policy/emergency/exotic-animal-disease-preparedness-report

National Lumpy Skin Disease Action Plan

In October 2022, the Minister for Agriculture, Fisheries and Forestry released the National Lumpy Skin Disease Action Plan. The plan has eight objectives and 27 activities to improve Australia's preparedness for a potential incursion of lumpy skin disease. The objectives are: international engagement, border biosecurity and trade, diagnostic capability, surveillance, preparedness and response, awareness and communications, research and innovation, and recovery.

Representatives from federal, state and territory governments, peak industry bodies and Animal Health Australia will share responsibility for the implementation of the plan. Quarterly progress reports will be provided to the National Biosecurity Committee and completed actions will be reported on the Animalplan website. An industry advisory group has also been established by the Department of Agriculture, Fisheries and Forestry in collaboration with the Red Meat Advisory Council to guide the implementation of the plan.

Read the plan:
agriculture.gov.au/biosecurity-trade/pests-diseases-weeds/animal/lumpy-skin-disease/national-action-plan

Senate inquiry into Australia's biosecurity measures and response preparedness

The Rural and Regional Affairs and Transport References Committee led an inquiry into the adequacy of Australia's biosecurity measures and response preparedness, with a focus on foot and mouth disease and varroa mite. The committee's report was released in December 2022 and outlines 29 recommendations. The Department of Agriculture, Fisheries and Forestry is preparing the government's response to these recommendations for release in 2023.

Read the report:
aph.gov.au/Parliamentary_Business/Committees/Senate/Rural_and_Regional_Affairs_and_Transport/FMDBiosecurity/Report

Laboratory simulation exercise

In July 2022, a scoping study was completed to support the detailed planning of a national laboratory simulation exercise for emergency animal diseases to be held in 2023. The exercise is a priority of the *National Animal Health Diagnostics Business Plan 2021–2026*. Its aim is to help identify needs and gaps in surge response capacity of Australia's laboratory and related industry systems for emergency animal diseases. The Subcommittee on Animal Health Laboratory Standards has been overseeing its development.

Read the plan:
agriculture.gov.au/sites/default/files/documents/national-animal-health-diagnostics-business-plan2021-26.pdf

Modernising diagnostic capability for emergency animal diseases

A number of projects to better prepare Australia's laboratory diagnostic capabilities for emergency animal diseases (such as lumpy skin disease, African swine fever and African horse sickness) were initiated or progressed during 2022. For example, the Australian Centre for Disease Preparedness (ACDP) undertook preparatory activities to support the transfer of real-time quantitative polymerase chain reaction (qPCR) and serological assays specific for lumpy skin disease to the national animal health laboratory network members. A project to develop robust and repeatable whole-genome sequencing procedures for lumpy skin disease and African horse sickness viruses was also completed. The ACDP also continued investigations into an early detection method for bovine Johne's disease based on the response pattern of host biomarkers (microRNA). Other laboratory preparedness projects progressed in 2022 include: building a new cross-sectoral biosecurity high-throughput sequencing network in northern Australia, developing a curated national genomic database for notifiable animal diseases, enhancing the interlaboratory information management system, and developing a portable qPCR platform for a variety of endemic and emergency cattle and pig diseases.

Read about the projects:
agriculture.gov.au/agriculture-land/animal/health/animal-plan#objective-2--improve-australias-surveillance-and-diagnostic-capacity-and-capability-for-animal-pests-and-diseases

AUSVETPLAN – informing emergency animal disease responses

During 2022, Animal Health Australia, in consultation with its government and industry members and stakeholders, updated seven AUSVETPLAN manuals and one resource document. This work included major revisions to the enterprise manual for the dairy industry and response strategies for foot and mouth disease and lumpy skin disease. These reviews ensure that Australia's response policies for a potential incursion of either foot-and-mouth disease or lumpy skin disease are current and incorporate the most up-to-date scientific information and risk-based decisions. Two government and industry exercises were held to test the response policy for lumpy skin disease, and further modifications are being made to incorporate the findings from these exercises.

Australia's emergency animal disease preparedness strengthened

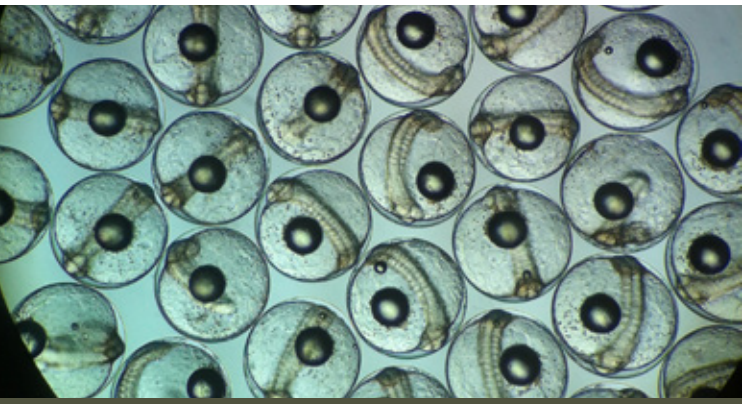
During 2022, 118 key personnel across government and industry organisations attended training workshops as part of national emergency animal disease preparedness initiatives. In addition to the workshops, AHA developed a just-in-time training pack for personnel representing affected industries in the Liaison — Livestock Industry role in an emergency animal disease response. It also released a *Consultative Committee on Emergency Animal Disease and National Management Group Information Guide*. Together these initiatives help to ensure that Australia has a cohort of people across government and industry familiar with the arrangements and ready to participate in a cost-shared response to an emergency animal disease.

National animal health initiatives

Animalplan 2022 to 2027

Animalplan 2022 to 2027: Australia's National Action Plan for Production Animal Health was endorsed by state, territory and federal ministers in 2022. Animalplan is the first Australian plan to set out national animal health objectives and activities, agreed by governments and industry organisations, for production animal industries. Responsibility for implementation is shared between government and industry and Animal Health Australia. Progress will be reported biannually.

Read the plan:
agriculture.gov.au/agriculture-land/animal/health/animal-plan



Credit: Northern Territory Department of Industry, Tourism and Trade

AQUAPLAN 2022–2027

AQUAPLAN 2022–2027, Australia's fourth national strategic plan for aquatic animal health, was endorsed by aquatic animal industries and state, territory and federal ministers in 2022. It provides a shared vision for governments and aquatic animal industry bodies to prioritise investment for strengthening Australia's aquatic animal health management system. By strengthening this system, AQUAPLAN will contribute to industry productivity and profitability, and the ongoing management of aquatic animal health and environments. AQUAPLAN's objectives are based on different components of the biosecurity system, such as surveillance, diagnostic capability, emergency preparedness, border biosecurity and trade. The plan identifies specific activities that will contribute to achieving each objective. Implementation of AQUAPLAN's activities is well underway, including a program of sector-specific emergency simulation exercises (activity 5.3) and developing a list of national priority aquatic animal diseases (activity 5.1). Progress will be reported biannually on the AQUAPLAN website.

Read about AQUAPLAN:
agriculture.gov.au/agriculture-land/animal/aquatic/aquaplan

Animal welfare

Virtual fencing harmonisation project

The Animal Welfare Task Group is examining the use of virtual fencing technology in response to a referral from the Agriculture Senior Officials' Committee. The technology uses GPS-enabled neckband or collar devices to produce mild electric pulses to deter livestock from approaching or crossing a virtual fence boundary. A subgroup is examining regulatory issues associated with this technology, with a focus on animal welfare outcomes. In 2022, the first project milestone was achieved with the completion of an independent literature review, which will underpin the work of the subgroup.

Australian Animal Welfare Standards and Guidelines for Poultry

The Independent Poultry Welfare Panel has finalised the development of proposed new *Australian Animal Welfare Standards and Guidelines for Poultry*, which have now been made public. The proposed standards balance contemporary animal welfare science with feedback from an extensive engagement process that was part of the independent review. The standards cover a range of welfare requirements for poultry, including chickens, ducks, pigeons and emus. Most notably, they propose the phase-out of conventional layer hen cages over the next 10 to 15 years. State and territory governments are now considering the standards, with all agriculture ministers to consider next steps in early 2023.

Credit: Animal Health Australia

Read the standards:
agriculture.gov.au/agriculture-land/animal/welfare/standards-guidelines/poultry

Australian Animal Welfare Standards and Guidelines for Livestock at Processing Facilities

New standards and guidelines are being developed to replace the 2002 *Model Code of Practice for the Welfare of Animals: Livestock at Slaughtering Establishments*. The Queensland Department of Agriculture and Fisheries is leading the project on behalf of the Animal Welfare Task Group. As part of the project, an independently facilitated Stakeholder Advisory Group was established to consider proposals and provide feedback. Drafting of the standards and guidelines commenced in 2022 and will continue into 2023, including further stakeholder and community consultation. The standards and guidelines will reflect contemporary scientific knowledge and practice and community expectations and help maintain Australia's strong reputation for animal welfare.

Read about the project:
agriculture.gov.au/agriculture-land/animal/welfare/awtg

Enhancing horse welfare during land transport

The Animal Welfare Task Group is reviewing the 2012 *Australian Animal Welfare Standards and Guidelines for the Land Transport of Livestock* for their suitability for horses. The project is being led by the Queensland Department of Agriculture and Fisheries. Equine industry stakeholders, livestock transporters and other interested stakeholders were invited to comment on proposed changes to the standards and guidelines via a Consultation Regulatory Impact Statement (RIS). More than 60 submissions were received, and all feedback is being considered in the development of the Decision RIS. When finalised, the amendments to the standards and guidelines will better reflect recent advances in scientific understanding of horse welfare and physiology and incorporate the practical expertise of those who work with horses daily.

Read about the project:
agriculture.gov.au/agriculture-land/animal/welfare/awtg

Changes to Queensland's *Animal Care and Protection Act 2001*

Amendments to the *Animal Care and Protection Act 2001* (Queensland) commenced in late 2022. The changes followed several initiatives in Queensland, including a legislative review in 2021, the Martin Inquiry, the Queensland Audit Office report on regulating animal welfare, and previous consultation processes on cattle spaying and pregnancy testing. Key amendments include:

- increasing penalties for a breach of the duty of care causing death, serious deformity, serious disablement, or prolonged suffering of an animal, with a maximum fine of $287,500 or 3 years imprisonment
- prohibiting the use and possession of pronged collars
- prohibiting firing or blistering of a horse or dog
- banning the use of carbon disulphide and phosphorous pig poison
- strengthening enforcement powers for inspectors, and changes to the appointment and training of inspectors and the governance of animal welfare investigations and prosecutions by the Royal Society for the Prevention of Cruelty to Animals (RSPCA) Queensland
- requiring dogs to be secured on a vehicle, with an exemption for working dogs
- introducing four-year terms for registration of scientific users of animals to align with auditing cycles
- implementing a new framework for accreditation schemes for cattle spaying and pregnancy testing.

Read about the amendments:
www.business.qld.gov.au/industries/farms-fishing-forestry/agriculture/animal/health/welfare/qld/act-changes

Victorian animal welfare legislative reform

The Victorian Government has continued to develop new animal welfare legislation to replace the *Prevention of Cruelty to Animals Act 1986* (Victoria). In September 2022, the government released its *Plan for Victoria's New Animal Care and Protection Laws* for public feedback. The plan proposed recognising animal sentience, a new approach to setting minimum standards of care for animals, and enhancements to the compliance and enforcement system. The draft legislation will be released in 2023 for further public feedback.

Read about the reform:
engage.vic.gov.au/new-animal-welfare-act-victoria

New South Wales education and awareness campaign for dog breeders and customers

In 2022, the New South Wales Department of Primary Industries launched a successful education and awareness campaign for dog breeders and customers. Designed to help raise awareness of the state's legislative requirements when breeding dogs, the campaign highlighted steps customers should take when buying a new puppy. This included the publication of a 'puppy purchasing checklist' and updating its online information about top questions to ask a breeder/seller and how to avoid scams. A newsletter was also distributed to over 5 million residents. The campaign was a success, with positive stakeholder feedback and over 1.8 million impressions on social media.

View the resources:
dpi.nsw.gov.au/animals-and-livestock/animal-welfare/animal-care-and-welfare/other/dogs-and-cats/buying

Animal welfare regulations for saleyard stakeholders in New South Wales

One of the priorities of the New South Wales Department of Primary Industries in 2022 was to promote the understanding and practical application of animal welfare regulations to saleyard stakeholders. To this end, members of the animal welfare team engaged with over 200 stock agents, saleyard managers and other stakeholders at face-to-face events around the state.

Legislative review in New South Wales

In 2022 the Standing Committee on State Development reviewed the Draft Animal Welfare Bill as part of the inquiry into animal welfare policy in New South Wales. The government has provided a response to the committee's first report and is considering all stakeholder and community feedback provided on the draft bill.

Credit: Animal Health Australia

New advisory committee for Western Australia

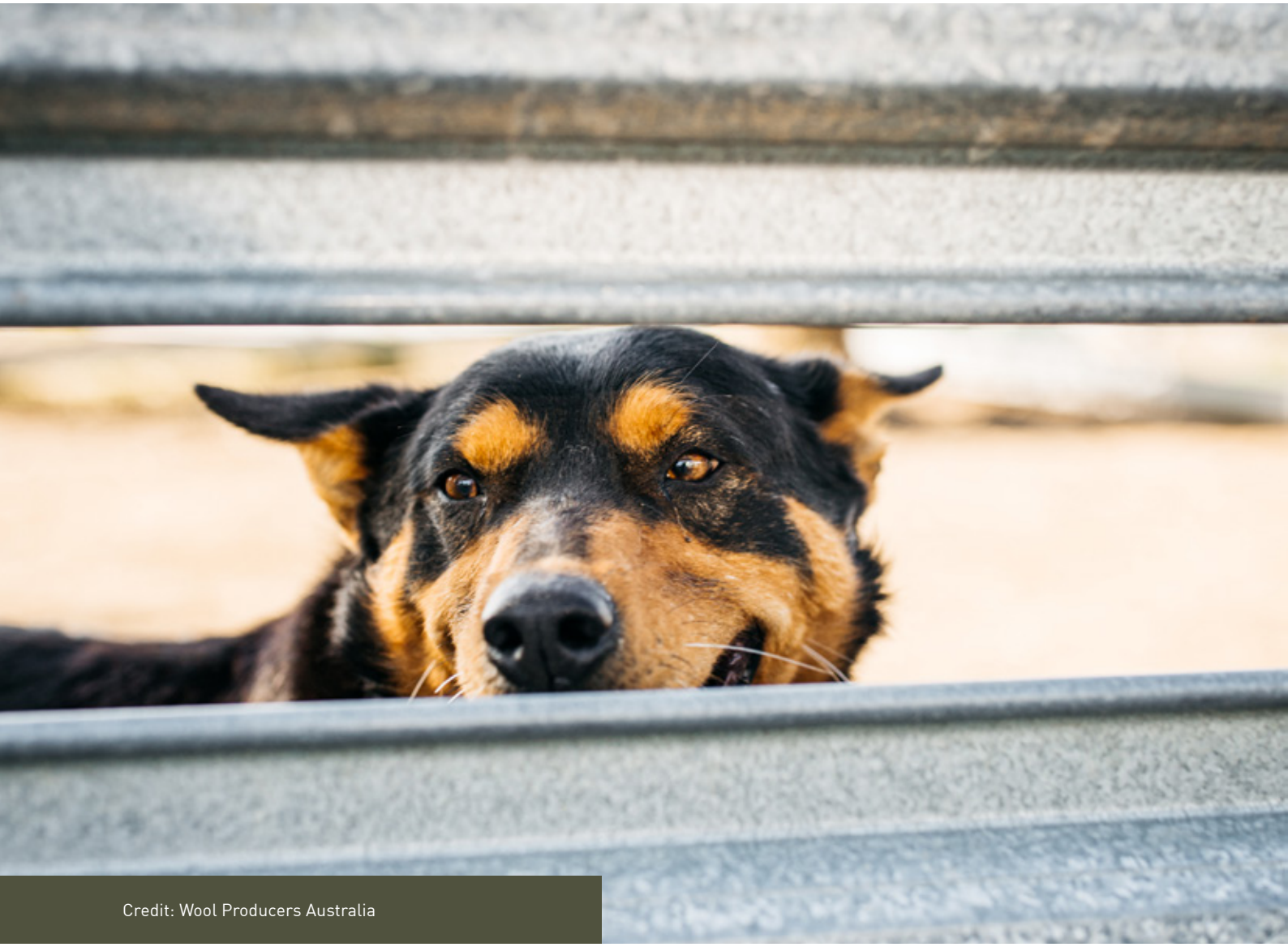
In February 2022, the Animal Welfare Advisory Committee for Western Australia was established to provide independent advice to the Minister for Agriculture and Food. The committee will provide advice on animal welfare policy, legislation, regulations and standards, community education, research and training standards for animal welfare inspectors.

Read about the advisory committee:
agric.wa.gov.au/AWAC

Modernising Western Australia's *Animal Welfare Act 2002*

Western Australia commenced work to prepare a bill to modernise the *Animal Welfare Act 2002* (Western Australia). The proposed amendments will put into effect many of the recommendations from the 2020 independent review of the operation and effectiveness of the *Animal Welfare Act 2002* that were supported by the Western Australian Government.

Read the review and the government's response:
agric.wa.gov.au/animalwelfare/review-animal-welfare-act-2002-government-response



Credit: Wool Producers Australia

Welfare of horses in Western Australia

Draft *Standards and Guidelines for the Health and Welfare of Horses in Western Australia* were released for public consultation on 24 October 2022 for a two-month period. The document sets out the minimum standards that owners and people responsible for horses must follow to ensure the health and welfare of horses kept in Western Australia.

Read the draft standards:
agric.wa.gov.au/animalwelfare/standards-and-guidelines-health-and-welfare-horses-wa

The Tasmanian Animal Welfare Amendment Bill 2022

In November 2022, the Tasmanian Government enacted the Animal Welfare Amendment Bill 2022 which was developed in conjunction with the RSPCA and other key stakeholders. The bill represents an important next step towards strengthening Tasmania's *Animal Welfare Act 1993* and providing greater protection for animals. Key changes introduced by the bill include banning the use of pronged collars, expanding the powers of authorised officers, and strengthening provisions for the enforcement and prosecution of offences. These changes will ensure improved welfare for all animals, including pets, livestock and wildlife.

Review of Australian Capital Territory Animal Welfare codes of practice

Early in 2022, the Australian Capital Territory's Animal Welfare Advisory Committee undertook a comprehensive review of the current codes of practice under the *Animal Welfare Act 1992* (Australian Capital Territory). Priorities have been identified, and work on the revisions is now underway.

Update of the Australian Capital Territory Domestic Animal Services website

During 2022, a comprehensive update of the Domestic Animal Services website was undertaken. The aim of the project was to improve the accessibility of animal welfare information, including codes of practice, for the community and industry groups.

Review the website:
cityservices.act.gov.au/pets-and-wildlife/domestic-animals/about-das

Licenses for Australian Capital Territory pet shops

A pet business licensing framework was introduced in 2021 for pet shops and boarding establishments. As of June 2022, all pet businesses in the Australian Capital Territory are now licensed. As a condition of their licence, they must abide by the relevant mandatory code of practice.

Industry-led projects

Strengthening preparedness for the sheep industry through novel technology

AHA, in partnership with South Australia's Department of Primary Industries and Regions and Think Digital, developed the Sheep Emergency Animal Disease augmented reality app. The app is compatible with Microsoft HoloLens headsets and other mobile devices. This free tool assists producers in recognising signs that could indicate exotic diseases such as foot and mouth disease, scrapie, bluetongue, and sheep and goat pox. It can also be used by consultants working with producers and other people who handle sheep (e.g. agents and saleyard staff) or anyone wanting to learn more about these diseases.

Read about the app:
news.microsoft.com/en-au/features/educating-farmers-about-emergency-animal-diseases-with-augmented-reality

Launch of the Decade of Biosecurity

The Decade of Biosecurity (2021–2030) program was officially launched at the 2nd Australian Biosecurity Symposium held in May 2022 at the Gold Coast. The program is an ambitious and critical initiative to transform our national biosecurity system to protect all Australians. By 2030, the program wants to ensure sustainable investment mechanisms for essential biosecurity, a strong understanding of biosecurity in all Australians and greater involvement in biosecurity surveillance across the country. The vision for the future is that all Australians are actively engaged in building a stronger national biosecurity system. The project is a powerful alliance of Animal Health Australia, Invasive Species Council, Centre for Invasive Species Solutions, Plant Health Australia, Landcare Australia, National Farmers Federation, National Landcare Network, NRM Regions Australia, Freight and Trade Alliance, and has the support from the state and federal governments.

Read about the initiative:
biosecurity2030.org.au

Sheep Sustainability Framework

The world's first Sheep Sustainability Framework was launched in 2021 and its first annual report was launched in 2022. The Sheep Sustainability Framework is led by Sheep Producers Australia and Wool Producers Australia. Its purpose is to identify sustainability issues for the Australian sheep industry, determine priorities and track metrics over time. In October 2022, the

first annual Sheep Sustainability Framework Consultative Committee meeting was held. At the event, the annual report and the results of an industry-wide survey, *On-Farm Insights from the National Producer Survey*, were shared with over 50 key stakeholders from peak industry councils, Research and Development Corporations and partner organisations.

Read the survey report:
www.sheepsustainabilityframework.com.au/globalassets/sheep-sustainability/media/ssf-on-farm-insights-report-web-25oct2022.pdf

ParaBoss

In 2021–22, Meat and Livestock Australia, Australian Wool Innovation and AHA funded the redevelopment of the ParaBoss website and tools. ParaBoss is a national resource for parasite control in sheep, goats and cattle. It provides independent and technical information on parasites and their control through its suite of products: WormBoss, FlyBoss, LiceBoss and TickBoss. This was the first major update of the website since its initial development in 2013–2016. Along with maintaining the accuracy and currency of the content, the aim of the redevelopment was to ensure that the online resources are more accessible and easier to use by producers and their advisors.

Read more:
paraboss.com.au

New era for the grassfed beef cattle industry in Australia

Cattle Australia is the new national peak body for the grassfed beef cattle industry. Its role is to advocate on all matters important to the Australian cattle industry. It seeks to provide leadership and direction by developing and driving contemporary policy, guiding research, development and adoption, and marketing investment for the sector.

Cattle Australia's mission is to be the voice of grassfed producers, leading the cattle industry to a strong and sustainable future.

Read more:
cattleaustralia.com.au/about-us

Alpaca industry launches new biosecurity program

The Australian Alpaca Association launched the new Alpaca CheQA program in 2022 to complement Q-Alpaca, which has been in place for many years. The first level of the new program is called Farm Protect, and it sets a basic level of biosecurity for the herd and property. Through implementing on-farm biosecurity practices in their alpaca herds, owners will protect the health of their livestock, limit production losses and help maintain market access for Australia's alpaca industry.

Read more:
alpaca.asn.au/alpaca-cheqa-farm-protect

Revamp of the national sheep and goat traceability system

In July 2022, the Australian Agricultural Ministers Forum, which includes state, territory and federal agriculture ministers, announced in-principle support for a national rollout of electronic identification devices (eIDs) for the sheep and goat industries. A Sheep and Goat Traceability Taskforce, which is comprised of government and industry representatives, has been set up to oversee the national rollout of eIDs from 1 January 2025.

Trade

Free Trade Agreements

Free trade agreements (FTAs) are an effective mechanism for opening up new trade and investment opportunities for Australian export industries while maintaining our science-based biosecurity approach and acknowledging the importance of improved animal welfare standards. The Australian Government is currently negotiating an FTA with the European Union as well as the India-Australia Comprehensive Economic Cooperation Agreement. An interim agreement with India and an FTA with the United Kingdom were ratified in the Australian Parliament in November 2022, with the Indian interim agreement entering into force on 29 December 2022.

Read more:
www.agriculture.gov.au/biosecurity-trade/market-access-trade/fta

Credit: Wool Producers Australia

Export market access

Market access for live horses to New Zealand has been maintained following the widespread detection of Japanese encephalitis on mainland Australia. New Zealand is Australia's largest export market for horses, and the detection of Japanese encephalitis virus threatened to impact trade. Other export markets were advised of the Japanese encephalitis virus situation via Australia's agriculture counsellor network, and trade disruption was prevented. The Department of Agriculture, Fisheries and Forestry also successfully negotiated the maintenance of market access for bovine germplasm to New Zealand, following its introduction of new import health standards.

Rabies risk review

The Department of Agriculture, Fisheries and Forestry completed a review of the rabies-related biosecurity risk for dog and cat imports. Rabies virus is not present in Australia but is the most significant biosecurity hazard associated with dog and cat imports to Australia. The review has led to updated conditions for dogs and cats entering Australia from 1 March 2023.

Varroa mite response

In response to an incursion of *Varroa destructor* into Australia, government biosecurity authorities and industry stakeholders are undertaking an emergency eradication response under the Emergency Plant Pest Response Deed (EPPRD). Led by the New South Wales Department of Primary Industries, the response involves the Department of Agriculture, Fisheries and Forestry, all state and territory governments, Plant Health Australia and affected industry parties that are signatories to the EPPRD. *V. destructor* is the most significant pest of bees worldwide with significant impacts on colony health and pollination-dependent industries. The early detection of the incursion has meant that eradication is considered technically feasible and cost beneficial, although the response remains ongoing.

Biosecurity risk reviews

The Department of Agriculture, Fisheries and Forestry continues to progress biosecurity import risk reviews in response to requests from other countries and proposals from Australian importers. In 2022, a risk review for fish and fish products for pet food and stockfeed was completed and trade can now occur under new import conditions. A review of the biosecurity risks associated with glanders (*Burkholderia mallei*) in horses and horse semen was conducted in response to changes in the global pattern of occurrence of glanders and interest from stakeholders on new horse import pathways. A regulated Biosecurity Import Risk Analysis for the import of live sturgeon for aquaculture purposes also commenced.

Revised conditions and certification for animals and animal products

Import conditions were revised in response to new information relating to various animals and animal products. For example, researchers at the University of Melbourne showed that pigeon paramyxovirus 1 (PPMV-1) is endemic in wild pigeon populations in Victoria and provided information on the biosecurity risks of PPMV-1 to domestic poultry. Based on the knowledge provided by this research and detections of PPMV-1 in other states and territories, the Department of Agriculture, Fisheries and Forestry removed all conditions associated with PPMV-1 for the import of live pigeons into Australia. This change has improved market access for importers, while ensuring that biosecurity measures are in place where warranted and Australia's international trade obligations continue to be met. The Department of Agriculture, Fisheries and Forestry assessed the African swine fever status of Belgium and recognised it as African swine fever free. This means that trade in pig meat can recommence. An African swine fever protection zone was also approved in the Caribbean territories of the United States. Croatia's status as free from lumpy skin disease without vaccination was recognised following completion of a preventative lumpy skin disease vaccination program and an evaluation of its controls and surveillance.

Read more:
www.agriculture.gov.au/biosecurity-trade/policy/risk-analysis/import-proposals

Risk assessment for importation of lumpy skin disease virus and vaccine

The Department of Agriculture, Fisheries and Forestry successfully completed an extensive risk assessment to facilitate the safe importation of lumpy skin disease vaccines and live lumpy skin disease virus into the ACDP. The risk assessment is a critical component of Australia's disease preparedness activities for a potential incursion of lumpy skin disease and was endorsed by the Inspector General of Biosecurity.

2

Terrestrial animal health status

Australia has a strong track record of freedom from the major epidemic diseases of livestock. Our geographical isolation provides a natural biosecurity barrier, which is supported by sound biosecurity policies and a history of successful disease eradication campaigns.

The spread of some endemic diseases of animals in Australia is limited by climate and the type of animal production enterprises present in an area. State and territory governments manage the control and eradication of certain endemic and notifiable animal diseases, often with the support of industry accreditation schemes.

This chapter provides information about Australia's status for all nationally significant terrestrial animal diseases.

2.1 Status of terrestrial animal health in Australia

Australia reports to the World Organisation for Animal Health (WOAH) on WOAH-listed diseases[1] every six months.[2] Table 2.1 shows Australia's status for WOAH-listed diseases in 2022.

Table 2.1 Australia's status for WOAH-listed diseases of terrestrial animals, 2022

Infection/Disease	Status	Date of last occurrence and notes
Multiple species disease		
Anthrax	Present	Limited distribution (see Figure 2.3)
Aujeszky's disease virus	Free	Never occurred
Bluetongue virus	Present	Restricted to specific zones of Australia (see Section 2.4); sentinel herd and vector-monitoring programs are in place
Brucella abortus	Free	Australia declared freedom from all terrestrial animal species in 1989
Brucella melitensis	Free	Never occurred in animals
Brucella suis	Serological evidence	Maintained in feral pigs in parts of New South Wales, the Northern Territory and Queensland. Rare occurrence in domestic pigs. Sporadic detections in pig-hunting dogs (not WOAH-notifiable occurrences)
Crimean Congo haemorrhagic fever	Free	Never occurred
Echinococcus granulosus	Present	–
Echinococcus multilocularis	Free	Never occurred
Epizootic haemorrhagic disease virus	Virus present	Disease has not been reported
Equine encephalomyelitis (Eastern)	Free	Never occurred
Foot and mouth disease virus	Free	1872; Australia is officially recognised by WOAH as free without vaccination
Heartwater	Free	Never occurred

Continued

1 woah.org/en/what-we-do/standards/codes-and-manuals/terrestrial-code-online-access

2 https://www.woah.org/#/home

Infection/Disease	Status	Date of last occurrence and notes
Japanese encephalitis	Present	In 2022 occurred in pigs, and one rare case was detected in an alpaca in South Australia
***Mycobacterium tuberculosis* complex**	Free	Australia declared freedom from bovine tuberculosis in 1997; the last case in any species was reported in 2002
New World screw-worm fly (*Cochliomyia hominivorax*)	Free	Never occurred
Old World screw-worm fly (*Chrysomya bezziana*)	Free	Never occurred
Paratuberculosis	Present	National control and management programs are in place
Q fever	Present	–
Rabies virus	Free	1867
Rift Valley fever virus	Free	Never occurred
Rinderpest virus	Free	1923; with the global eradication of rinderpest in 2011, all countries are free
Surra (*Trypanosoma evansi*)	Free	1907
***Trichinella* spp.**	Limited species present	*Trichinella spiralis* is not present; *T. pseudospiralis* is present in wildlife
Trypanosoma brucei*, *Trypanosoma congolense*, *Trypanosoma simiae* and *Trypanosoma vivax	Free	Never occurred
Tularaemia	Present	–
West Nile fever	Australian variants present	Occurred in 2022 in horses in Victoria
Cattle diseases		
Bovine anaplasmosis	Present	Transmission mainly in areas of northern Australia
Bovine babesiosis	Present	Transmission mainly in areas of northern Australia
Bovine genital campylobacteriosis	Present	–
Bovine spongiform encephalopathy	Free – negligible risk	Never occurred; the Transmissible Spongiform Encephalopathies Freedom Assurance Project includes surveillance (see Section 2.4); Australia has official WOAH 'negligible risk' status
Bovine viral diarrhoea	Present	Bovine viral diarrhoea virus 1 (BVDV-1) is present; BVDV-2 has never occurred

Continued

Infection/Disease	Status	Date of last occurrence and notes
Contagious bovine pleuropneumonia (*Mycoplasma mycoides* subsp. *mycoides* SC)	Free	1967; Australia declared freedom in 1973 and is officially recognised by WOAH as free
Enzootic bovine leucosis	Free (dairy cattle herd) Very low prevalence (beef cattle)	Australian dairy herd achieved freedom in 2012
Haemorrhagic septicaemia	Free	Never occurred; strains of *Pasteurella multocida* are present, but not the 6b or 6e strains that cause haemorrhagic septicaemia
Infectious bovine rhinotracheitis/infectious pustular vulvovaginitis	Present	Bovine herpesvirus (BHV)-1.2b is present; BHV-1.1 and BHV-1.2a have never occurred
Lumpy skin disease virus	Free	Never occurred
Theileriosis	Free	*Theileria orientalis* is present in Australia but WOAH-listed species *T. parva* and *T. annulata* are not
Trichomonosis	Present	–
Sheep and goat diseases		
Caprine arthritis/encephalitis	Present	Voluntary accreditation schemes exist
***Chlamydophila abortus* (enzootic abortion of ewes, ovine chlamydiosis)**	Free	Never occurred
Contagious agalactia	Free	*Mycoplasma agalactiae* has been isolated, but Australian strains do not produce agalactia in sheep
Contagious caprine pleuropneumonia	Free	Never occurred
Maedi–visna	Free	Never occurred
Nairobi sheep disease	Free	Never occurred
Ovine epididymitis (*Brucella ovis*)	Present	Voluntary accreditation schemes exist in all states
Peste des petits ruminants virus	Free	Never occurred; Australia is officially recognised by WOAH as free
Salmonellosis (*Salmonella* Abortusovis)	Free	Never occurred; surveillance has shown no evidence of infection in sheep
Scrapie	Free	1952; the Transmissible Spongiform Encephalopathies Freedom Assurance Project includes surveillance (see Section 2.4); atypical scrapie has been detected several times
Sheep pox and goat pox	Free	Never occurred

Continued

Infection/Disease	Status	Date of last occurrence and notes
Equine diseases		
African horse sickness virus	Free	Never occurred; Australia is officially recognised by WOAH as free
Contagious equine metritis	Free	1980
Dourine	Free	Never occurred
Equid herpesvirus 1 (Equine rhinopneumonitis)	Present	–
Equine arteritis virus	Serological evidence	–
Equine encephalomyelitis (Western)	Free	Never occurred
Equine infectious anaemia	Present	Limited distribution and sporadic occurrence
Equine influenza	Free	2007; Australia self-declared freedom according to WOAH standards in 2008[3]
Equine piroplasmosis	Free	1976
Glanders (*Burkholderia mallei*)	Free	1891
Venezuelan equine encephalomyelitis	Free	Never occurred
Swine diseases		
African swine fever virus	Free	Never occurred
Classical swine fever virus	Free	1962; Australia is officially recognised by WOAH as free
Nipah virus encephalitis	Free	Never occurred
Porcine reproductive and respiratory syndrome virus	Free	Never occurred
***Taenia solium* (porcine cysticercosis)**	Free	Never occurred
Transmissible gastroenteritis	Free	Never occurred
Avian diseases		
Avian chlamydiosis	Present	–
Avian infectious bronchitis	Present	–
Avian infectious laryngotracheitis	Present	–
Avian mycoplasmosis (*Mycoplasma gallisepticum*)	Present	–

Continued

3 www.woah.org/fileadmin/Home/eng/Animal_Health_in_the_World/docs/pdf/Self-declarations/Archives/ENG_archive_2000_December_2020.pdf

Infection/Disease	Status	Date of last occurrence and notes
Avian mycoplasmosis (*Mycoplasma synoviae*)	Present	–
Duck virus hepatitis	Free	Never occurred
Fowl typhoid	Free	1952
High pathogenicity avian influenza (HPAI) viruses in poultry	Free	2020; Australia self-declared freedom in accordance with WOAH standards on 26 February 2021
Infectious bursal disease (Gumboro disease)	Present	Infectious bursal disease occurs in a mild form and was last reported in 2004; Very virulent strains are not present
Influenza A viruses of high pathogenicity in birds other than poultry, including wild birds	Free	HPAI viruses have not been detected in Australian wild birds, other than a single detection of HPAI H7 virus in one feral Eurasian starling trapped inside an affected poultry shed during the 1985 HPAI H7 virus outbreak
Newcastle disease virus	Lentogenic viruses present	Virulent Newcastle disease last occurred in poultry in 2002; in August 2011, a paramyxovirus not previously reported in Australia was detected in hobby pigeons in Victoria; disease caused by this virus has not spread to poultry
Pullorum disease	Not reported	Last reported in 1992; *Salmonella* Pullorum has been eradicated from commercial chicken flocks
Turkey rhinotracheitis	Free	Never occurred
Lagomorph diseases and infections		
Myxomatosis	Present	Used as a biological control agent for wild rabbits
Rabbit haemorrhagic disease	Present	Used as a biological control agent for wild rabbits. A new strain was detected in 2015 and another released in 2017
Bee diseases and infections		
Infection of honey bees with *Melissococcus plutonius* (European foulbrood)	Present	–
Infection of honey bees with *Paenibacillus larvae* (American foulbrood)	Present	–
Infestation of honey bees with *Acarapis woodi*	Free	Never occurred
Infestation of honey bees with *Tropilaelaps* spp.	Free	Never occurred

Continued

Infection/Disease	Status	Date of last occurrence and notes
Infestation of honey bees with *Varroa* spp.	Limited distribution and under eradication	An incursion of *Varroa destructor* was identified in June 2022 in New South Wales. A response to eradicate *V. destructor* is underway.
Infestation with *Aethina tumida* (small hive beetle)	Present	Restricted distribution
Other diseases and infections		
Camel pox	Free	Never occurred
Infection of dromedary camels with Middle East respiratory syndrome coronavirus	Free	Never occurred
Leishmaniasis	Australian variant, *Leishmania macropodum*, present	Rare; Australian variant was first isolated in 2000 from macropods and occurs infrequently in a small region near Darwin; in 2017, it was isolated in a new species, captive Nabarlek (pygmy rock wallaby, *Petrogale concinna*) in the Northern Territory. Occasional imported case of *L. infantum* with no known local transmission

2.2 National List of Notifiable Animal Diseases of Terrestrial Animals

The National List of Notifiable Animal Diseases of Terrestrial Animals[4] facilitates disease reporting and control by identifying diseases that must be reported to an agricultural authority upon detection. The list agreed by the Animal Health Committee includes not only all diseases notifiable to WOAH but also endemic diseases of national significance. The requirement to report disease occurrences on this list to government authorities is mandated by state and territory legislation.

The Animal Health Committee reviews the list on a regular basis. The most recent review was finalised in 2019. Table 2.2 shows Australia's status for diseases on the National List of Notifiable Diseases of Terrestrial Animals that are not reportable to WOAH for 2022.

4 www.agriculture.gov.au/biosecurity-trade/pests-diseases-weeds/animal/notifiable

Table 2.2 Australia's status for diseases on the National List of Notifiable Diseases of Terrestrial Animals that are not reportable to WOAH, 2022

Diseases/infections and infestation	Status	Date of last occurrence and notes
Australian bat lyssavirus	Present	–
Borna disease virus	Free	Never reported
Brucella canis	Free	Never reported
Bungowannah virus (porcine myocarditis)	Present	2003; restricted distribution, one piggery
Devil facial tumour disease	Present	Restricted distribution
Duck herpesvirus 1 (duck viral enteritis / duck plague)	Free	Never reported
***Ehrlichia canis* (ehrlichiosis)**	Present	Detected for the first time in Australian dogs in May 2020; restricted distribution
Encephalitides (tick-borne)	Free	Never reported
Equine encephalosis virus	Free	Sporadic occurrence
Getah virus	Free	Never reported
Hendra virus	Present	Sporadic occurrence; see Section 2.3
***Histoplasma farciminosum* (epizootic lymphangitis)**	Free	Never reported
Influenza A viruses in swine	Present	–
Jembrana disease virus	Free	Never reported
Louping ill	Free	Never reported
Malignant catarrhal fever (wildebeest-associated)	Free	Never reported
Menangle virus	Present	1997
***Mycobacterium avium* (avian tuberculosis)**	Present	–
Mycoplasma iowae	Free	Never reported
***Neorickettsia risticii* (Potomac horse fever)**	Free	Never reported
Porcine epidemic diarrhoea virus	Free	Never reported; national survey conducted in 2016 with negative results
Post-weaning multi-systemic wasting syndrome	Free	Never reported
***Pseudogymnoascus destructans* in bats (white nose syndrome)**	Free	Never reported

Continued

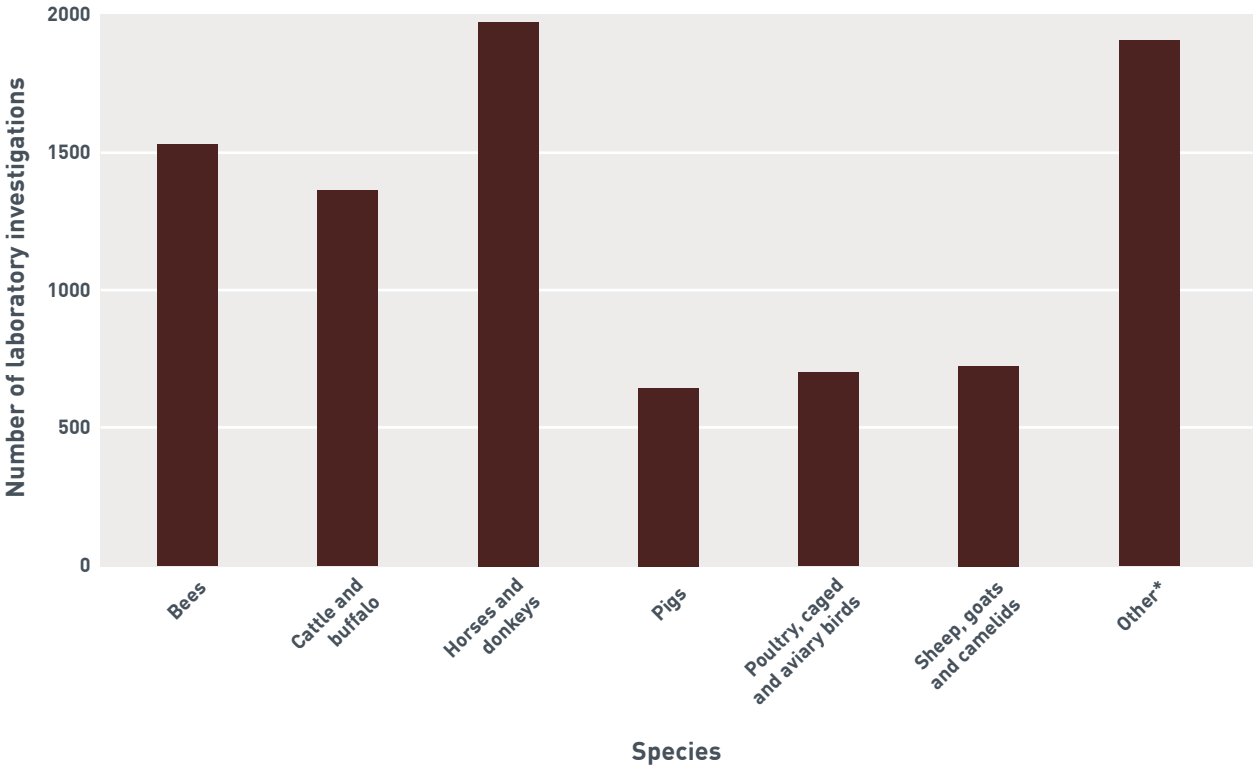
Diseases/infections and infestation	Status	Date of last occurrence and notes
***Psoroptes ovis* (sheep scab)**	Free	1896
Pulmonary adenomatosis (jaagsiekte)	Free	Never reported
***Salmonella* Abortus-equi**	Free	Never reported
***Salmonella* Enteritidis in poultry**	Present	National *Salmonella* Enteritidis Monitoring and Accreditation Program available for commercial egg producers. Five serological positive flocks reported in poultry in 2021
Seneca Valley virus (Senecavirus A)	Free	Never reported
Swine vesicular disease virus	Free	Never reported
***Taenia saginata* (cysticercus bovis)**	Present	–
***Teschovirus* A (porcine enteroviral encephalomyelitis)**	Present	–
Transmissible spongiform encephalopathies (chronic wasting disease of deer, feline spongiform encephalopathy)	Free	Two cases of feline spongiform encephalopathy have been diagnosed in imported animals in Australian zoos in 1992 (cheetah) and 2002 (Asiatic golden cat), where disease is thought to have been caused by exposure to feeds derived from bovine spongiform encephalopathy-affected cattle before the animals were imported to Australia
***Trypanosoma cruzi* (Chagas disease)**	Free	Never reported
Vesicular exanthema	Free	Never reported
Vesicular stomatitis virus	Free	Never reported
Warble fly infestation	Free	Never reported
Wesselsbron virus	Free	Never reported

Disease investigations were undertaken throughout 2022 in animals exhibiting clinical signs potentially consistent with a national notifiable disease[5] (excluding wildlife and feral animals). As part of these investigations, 8824 testing events were conducted at government veterinary laboratories to detect or exclude one or more national notifiable diseases. Investigations may have involved single or multiple animals from a herd or flock (Figure 2.1).

An overall increase in laboratory investigations was seen from the prior year, in part due to the recovery of operations of animal health services post COVID-19 movement restrictions (Figures 2.2 to 2.9). This year also saw an increase in testing in horses and pigs in relation to the Japanese encephalitis outbreak. The number of laboratory investigations into national notifiable diseases of cattle and buffalo increased, in part reflective of the heightened awareness of exotic disease risks in the region.

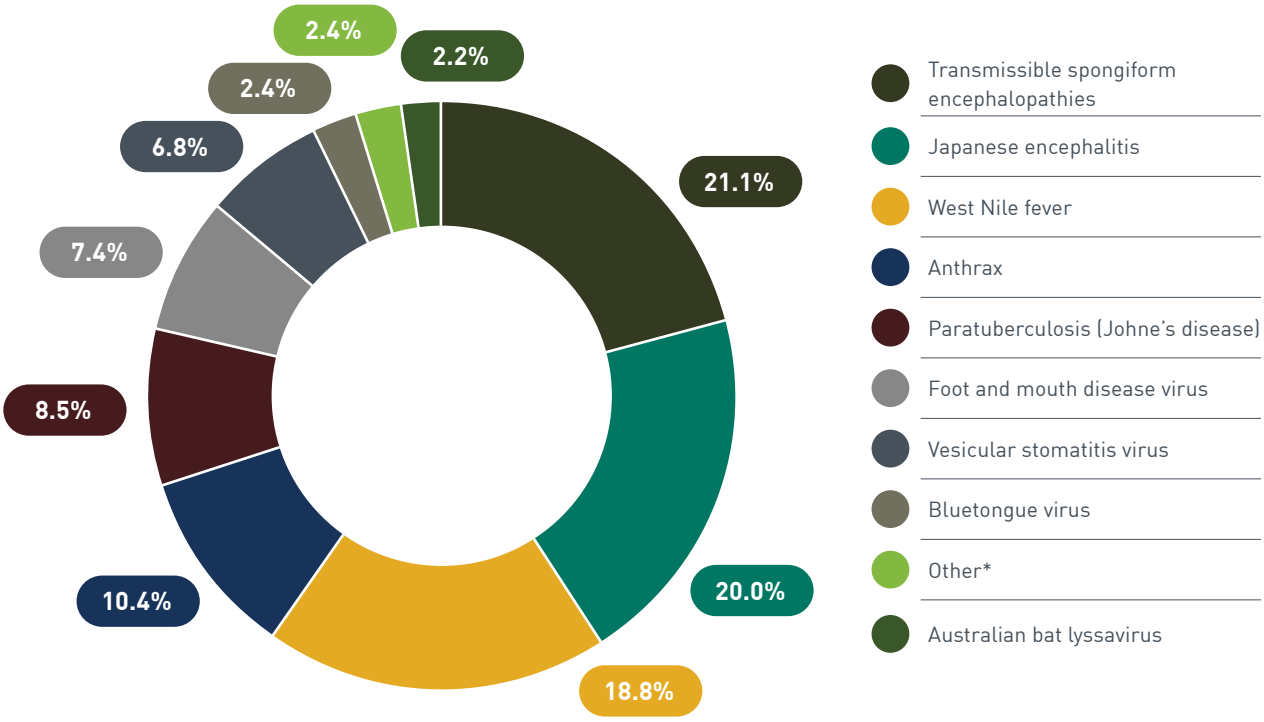
Investigations of caged and aviary birds, poultry, sheep, goats and camelids remained stable.

5 www.agriculture.gov.au/biosecurity-trade/pests-diseases-weeds/animal/notifiable#national-list-of-notifiable-diseases-of-terrestrial-animals-at-april-2019



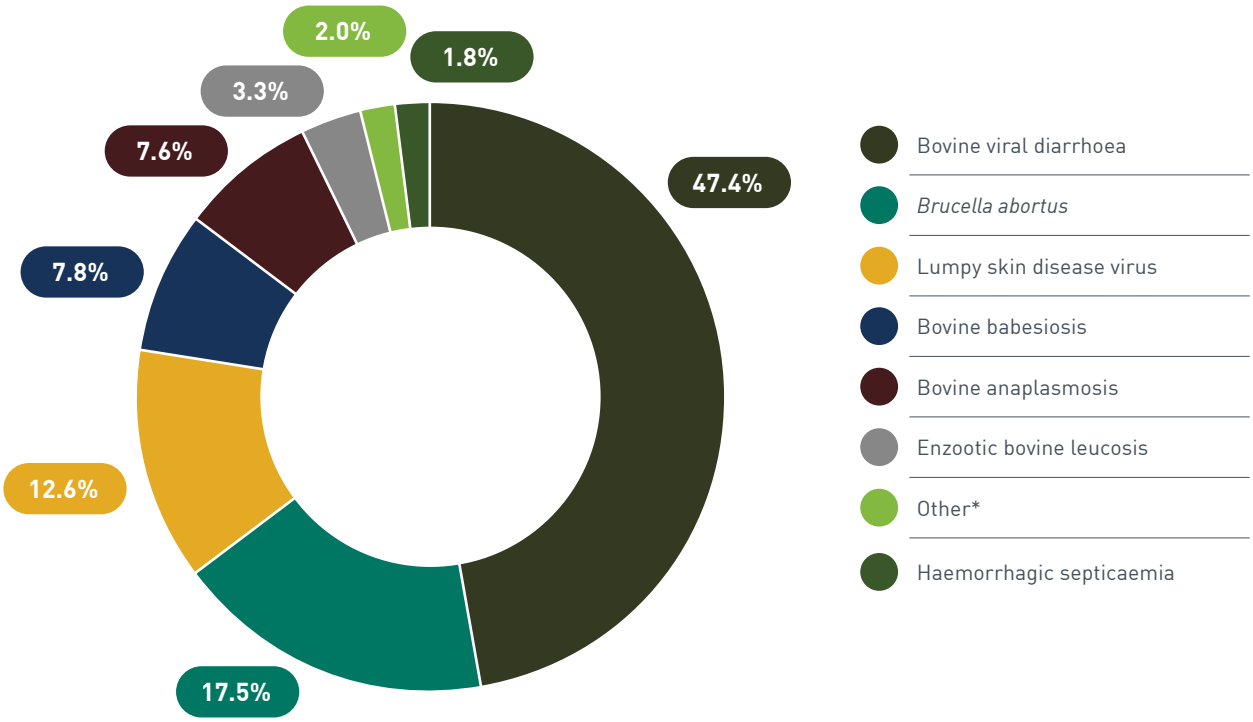
*Other species includes: cat, deer, and dog.

Figure 2.1 Number of investigations for national notifiable diseases in Australia in 2022



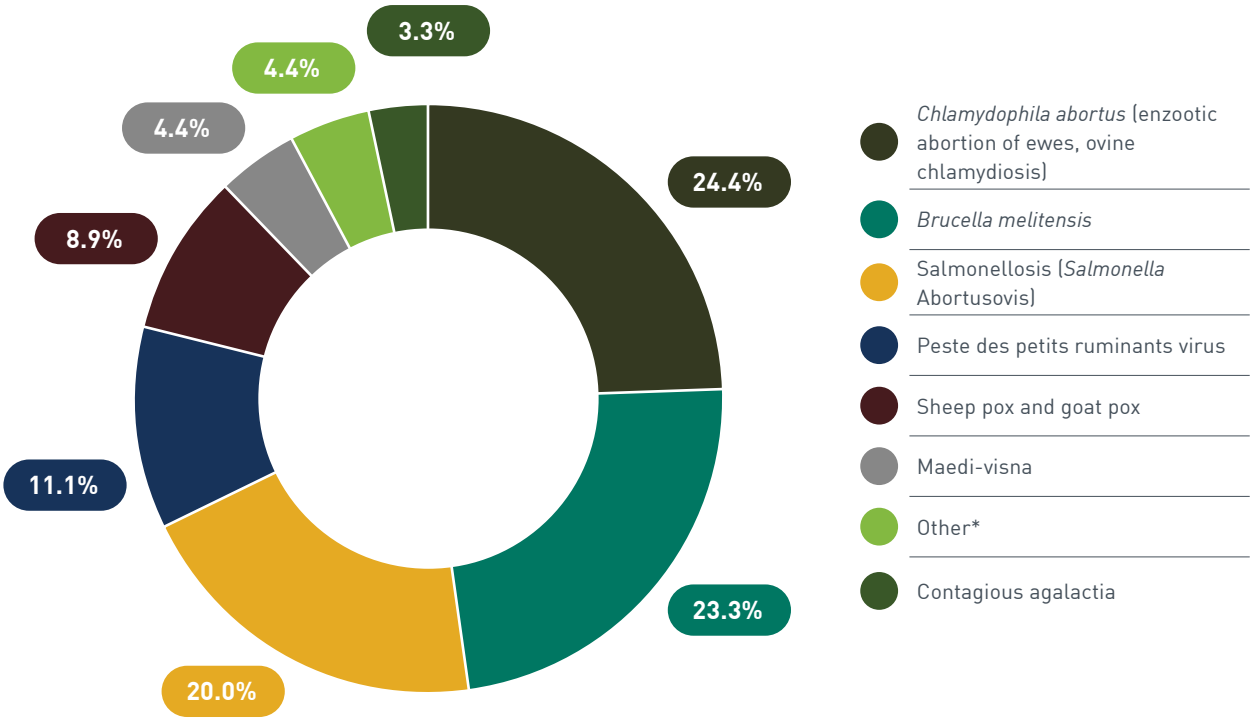
*Other includes: Encephalitides (tick-borne), *Echinococcus multilocularis*, epizootic haemorrhagic disease, malignant catarrhal fever, *Mycobacterium bovis*, Old World screw-worm (*Chrysomya bezziana*), New World screw-worm (*Cochliomyia hominivorax*), rabies, Rift Valley fever, surra (*Trypanosoma evansi*) and warble fly infestation.

Figure 2.2 Laboratory exclusions of national notifiable diseases of multiple species in Australia in 2022 (total = 2073 exclusions)



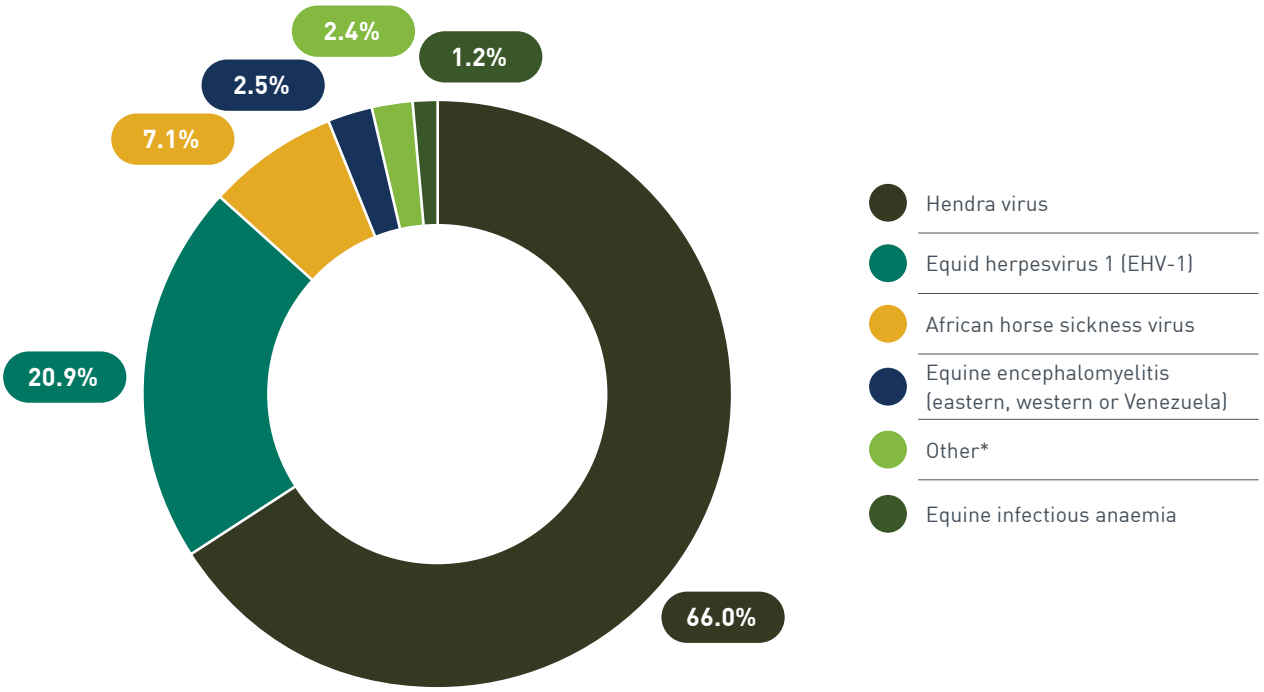
*Other includes: Contagious bovine pleuropneumonia (*Mycoplasma mycoides* subsp. *mycoides* SC), *Theileria parva* (East Coast fever) or *T. annulata* (Mediterranean theileriosis).

Figure 2.3 Laboratory exclusions of national notifiable diseases of cattle in Australia in 2022 (total = 707 exclusions)



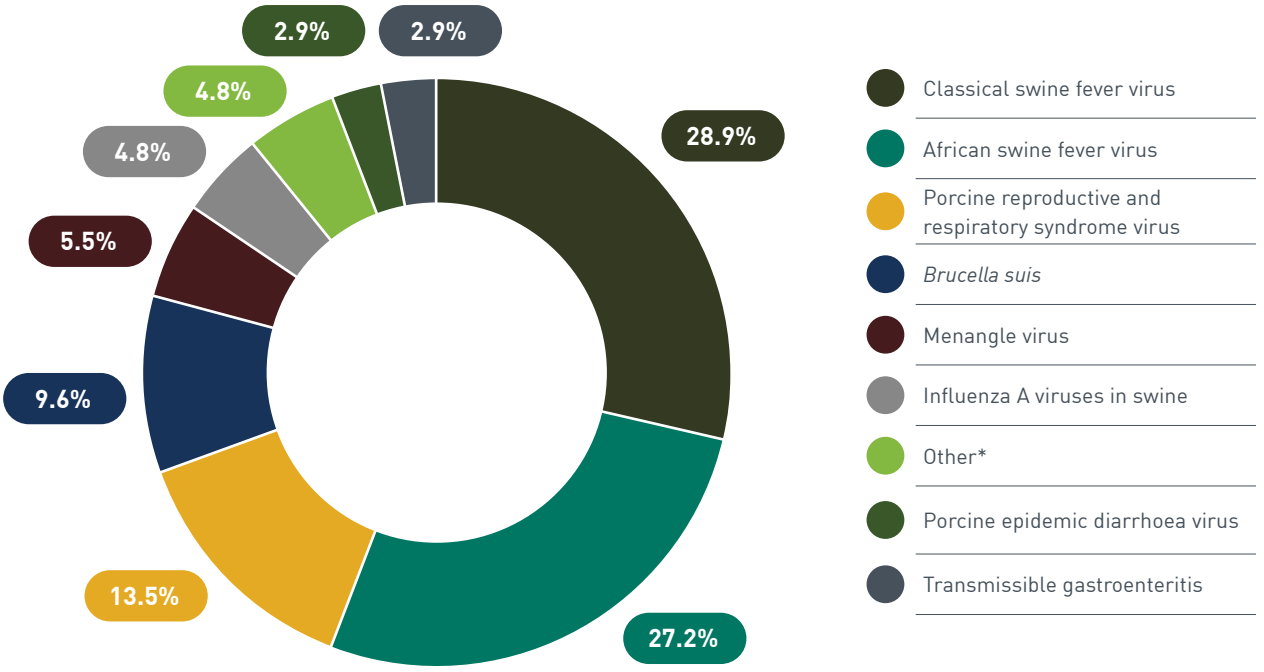
*Other includes: Contagious caprine pleuropneumonia, *Psoroptes ovis* (sheep scab), Wesselsbron virus.

Figure 2.4 Laboratory exclusions of national notifiable diseases of sheep and goats in Australia in 2022 (total = 90 exclusions)



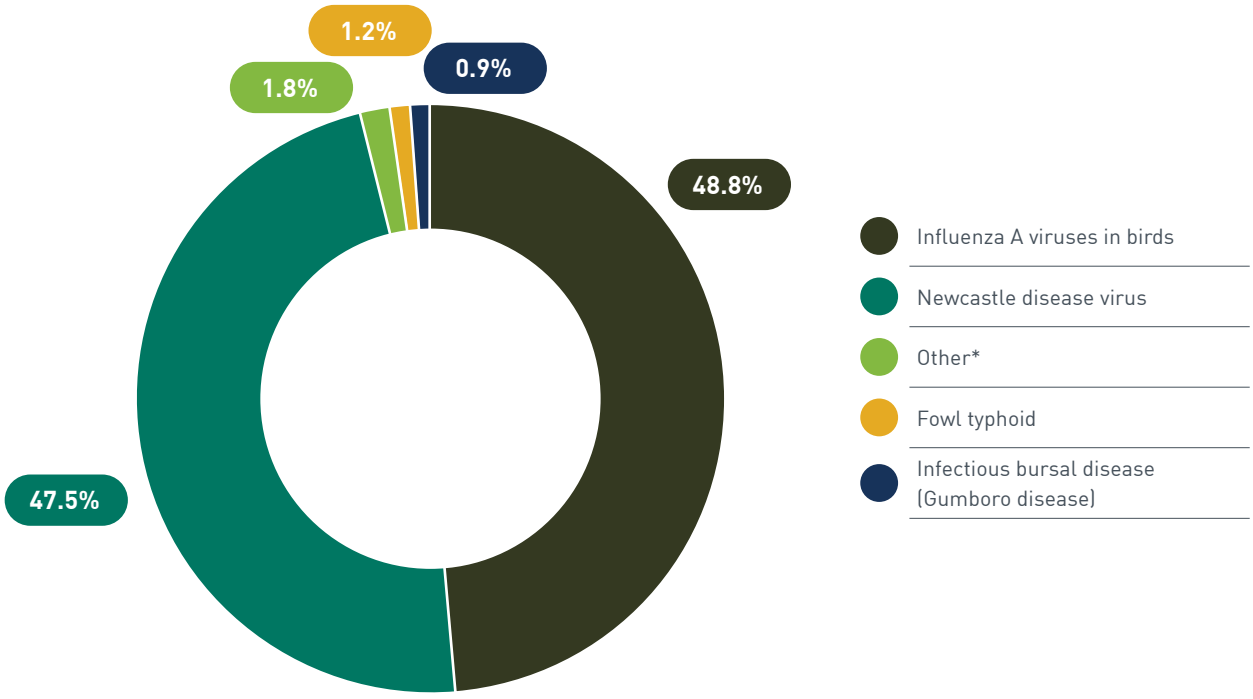
*Other includes: Contagious equine metritis, equine piroplasmosis, equine arteritis virus, equine encephalosis virus, equine influenza, *Salmonella* Abortus-equi.

Figure 2.5 Laboratory exclusions of national notifiable diseases of equines in Australia in 2022 (total = 1304 exclusions)



*Other includes: Bungowannah virus (porcine myocarditis), *Teschovirus* A (porcine enteroviral encephalomyelitis), vesicular exanthema.

Figure 2.6 Laboratory exclusions of national notifiable diseases of swine in Australia in 2022 (total = 312 exclusions)



*Other includes: Avian tuberculosis (*Mycobacterium avium*), duck virus hepatitis, turkey rhinotracheitis (avian metapneumovirus), *Salmonella* Enteritidis and pullorum disease.

Figure 2.7 Laboratory exclusions of national notifiable diseases of avians in Australia in 2022 (total = 685 exclusions)

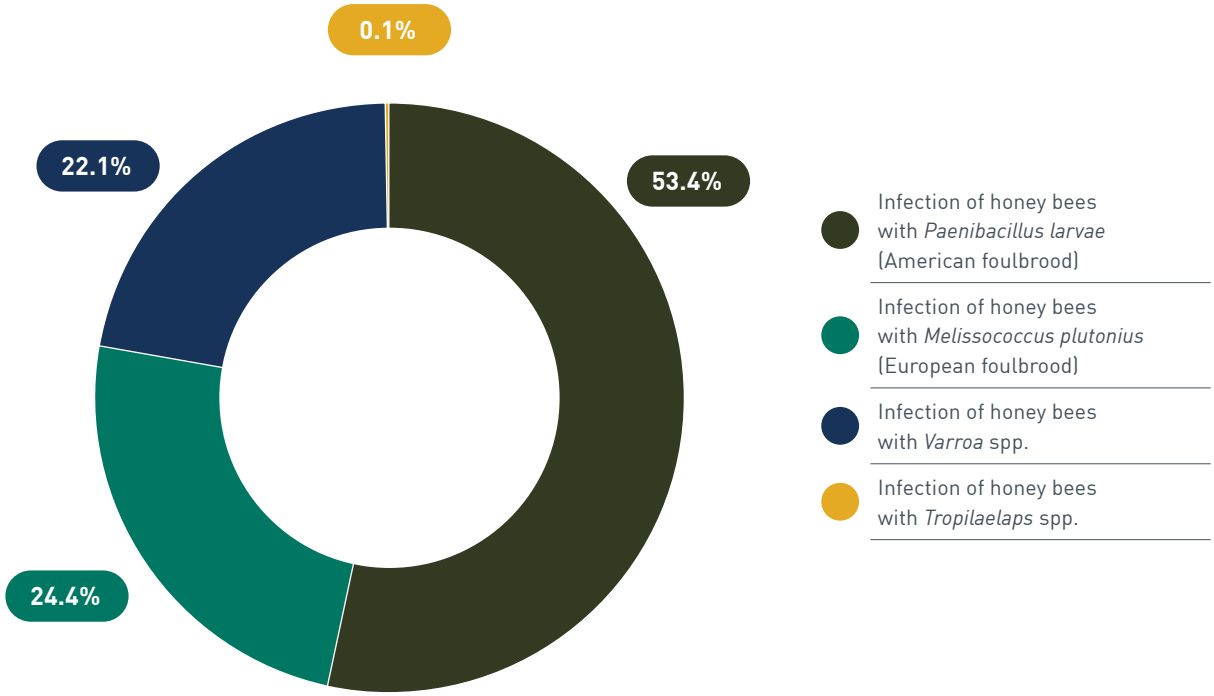


Figure 2.8 Laboratory exclusions of national notifiable diseases of bees in Australia in 2022 (total = 1077 exclusions)

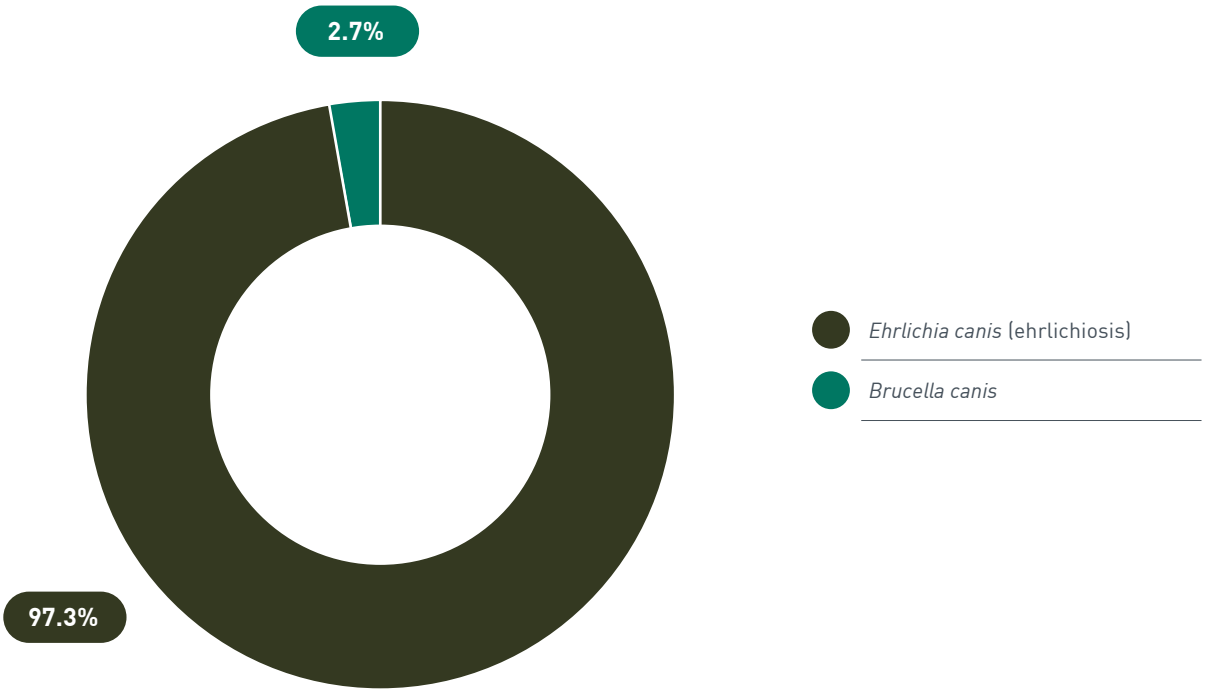


Figure 2.9 Laboratory exclusions of national notifiable diseases of other domestic animals in Australia in 2022 (total = 899 exclusions)

2.3 Significant disease incidents and status changes of nationally notifiable terrestrial animal diseases in 2022

This section provides further information about investigations of nationally notifiable terrestrial animal diseases in 2022, to support Australia's disease status for WOAH-listed diseases presented in Table 2.1. In particular, it outlines Australia's response to significant disease incidents important to international trade and market access, which has helped safeguard Australia's animal health status through 2022. Supplementary information about specific disease incidents can be found in *Animal Health Surveillance Quarterly* editions for 2022.[6]

6 animalhealthaustralia.com.au/supporting-market-access

Anthrax

In February 2022, anthrax was confirmed as the cause of six sheep deaths on a single property near Swan Hill, Victoria, where anthrax had previously been detected. The deaths were observed in a mob of approximately 140 ram lambs that had been vaccinated against anthrax in the spring of 2021. The affected property was immediately quarantined, and the carcasses were disposed of safely. All sheep on the property received an additional vaccination and no further losses were recorded.

Japanese encephalitis virus

In 2022, Australia experienced an outbreak of Japanese encephalitis in pigs and humans in south-eastern Australia — the first time Japanese encephalitis virus (JEV) has been detected in these areas (Figure 2.10). Historical outbreaks occurred in humans in the Torres Strait and the northern Cape York Peninsula region of Far North Queensland in 1995 and 1998. Surveillance of animals in these areas has revealed serological reactivity to JEV

and/or closely related viruses in most years, which was thought to represent seasonal incursions that did not establish on the mainland.

The Consultative Committee for Emergency Animal Disease (CCEAD) was convened on 28 February 2022 in response to detections of Japanese encephalitis in domestic pigs. The committee determined that JEV would not be eradicable due to the near-simultaneous detections across a wide geographical area, transmission by mosquito vectors and the likelihood of wildlife reservoirs in which transmission could persist. The response focused on supporting the public health sector to mitigate risks to human health. This included coordinating with public health authorities to ensure affected properties implemented appropriate vector management, detecting clinical cases of Japanese encephalitis, and retrospective and prospective surveillance to delineate the geographical spread.

Hendra virus

One case of Hendra virus spillover infection was confirmed in the Mackay area in Queensland in July 2022 involving a single horse with fatal outcome. The horse exhibited disease manifestations typical of previous cases of Hendra virus (disorientation and obtunded demeanour, abnormal chewing and difficulty eating (dysphagia), staggering (ataxia), and oedema of the head). The attending private veterinary practitioner initiated appropriate sampling and priority laboratory investigation, implemented appropriate biosecurity protocols and euthanased the animal on humane grounds. Human health and exposure assessment guided appropriate emergency post-exposure prophylaxis in those requiring it and no additional human or animal cases were recognised.

Hendra virus was recently found to circulate among flying foxes as two distinct genotypic variants. This

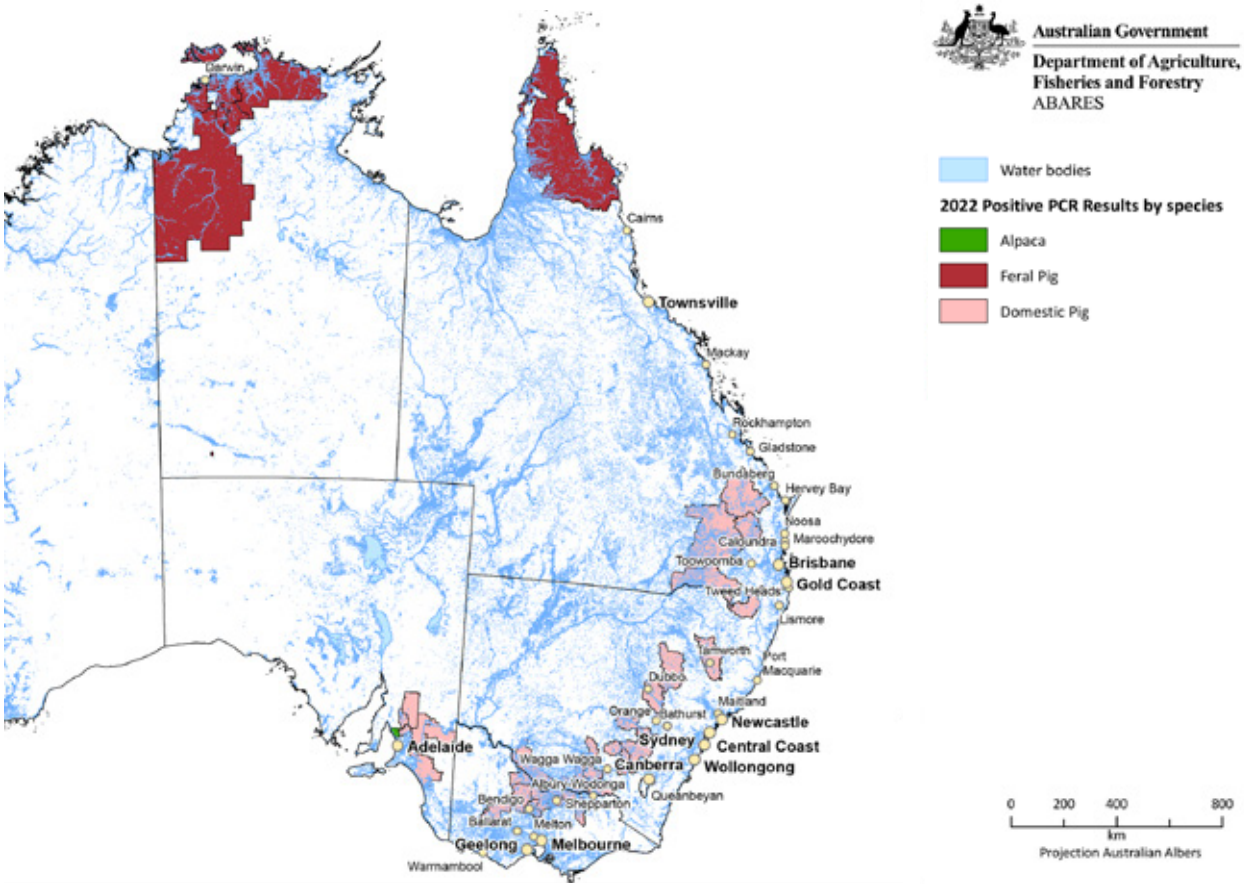


Figure 2.10 Distribution of confirmed JEV infections in vertebrate animals by local government area during the outbreak period

has implications for potential spillover infection in horses across all regions of Australia in which flying foxes are living (regardless of flying fox species).

2.4 National targeted surveillance programs

The Australian animal health system is underpinned by key partnerships and networks of government, livestock industries, wildlife and commercial organisations, and individuals. Together, they work across a range of programs to investigate significant disease incidents and undertake surveillance and monitoring activities to determine disease distribution and status. The *Animal Health in Australia System Report*[7] provides an overview of these programs, and an update on program activities from 2022 is presented below.

National Arbovirus Monitoring Program

The National Arbovirus Monitoring Program (NAMP) monitors the distribution of economically significant arboviruses (insect-borne viruses) of livestock (cattle, sheep, goats and camelids) and insect vectors in Australia (*Culicoides* species biting midges). Arboviruses of interest to the NAMP include bluetongue, Akabane and bovine ephemeral fever viruses. Monitoring occurs through a network of sentinel cattle herds, strategic serological survey herds and insect trapping sites.

The program maintains an online interactive Bluetongue Virus (BTV) Zone Map,[8] which informs livestock producers and key stakeholders of the distribution of BTV within Australia. The map is updated as needed in response to confirmed changes in the distribution of BTV transmission.

Throughout the 2021–2022 season, unprecedented rainfall and flooding events were observed across much of eastern Australia. BTV distribution through central and north-western New South Wales was extensive, reaching its historical prior limits in the North West Slopes region near Pilliga and recording its first detections near Dunedoo in the Central West and Mudgee in the Central Tablelands. The interactive BTV Zone Map was promptly updated in response to these findings. During 2022, a retraction of the BTV transmission zone boundary was made in the South Coast of New South Wales following the absence of BTV transmission in the region over the past two years.

The predominant BTV serotypes circulating throughout the 2021–2022 season were BTV 1, 15, 16 and 21. This season, BTV-7 and BTV-23 were detected at Kalumburu, in northern Western Australia. This is the first time that BTV-23 has been detected in Australia since 1989, and its finding was isolated to one site. Given the genetic variation in the sample, it was most likely a novel incursion.

The results of the NAMP's arbovirus transmission monitoring activities are published annually on the Animal Health Australia website.[9]

National Significant Disease Investigation Program

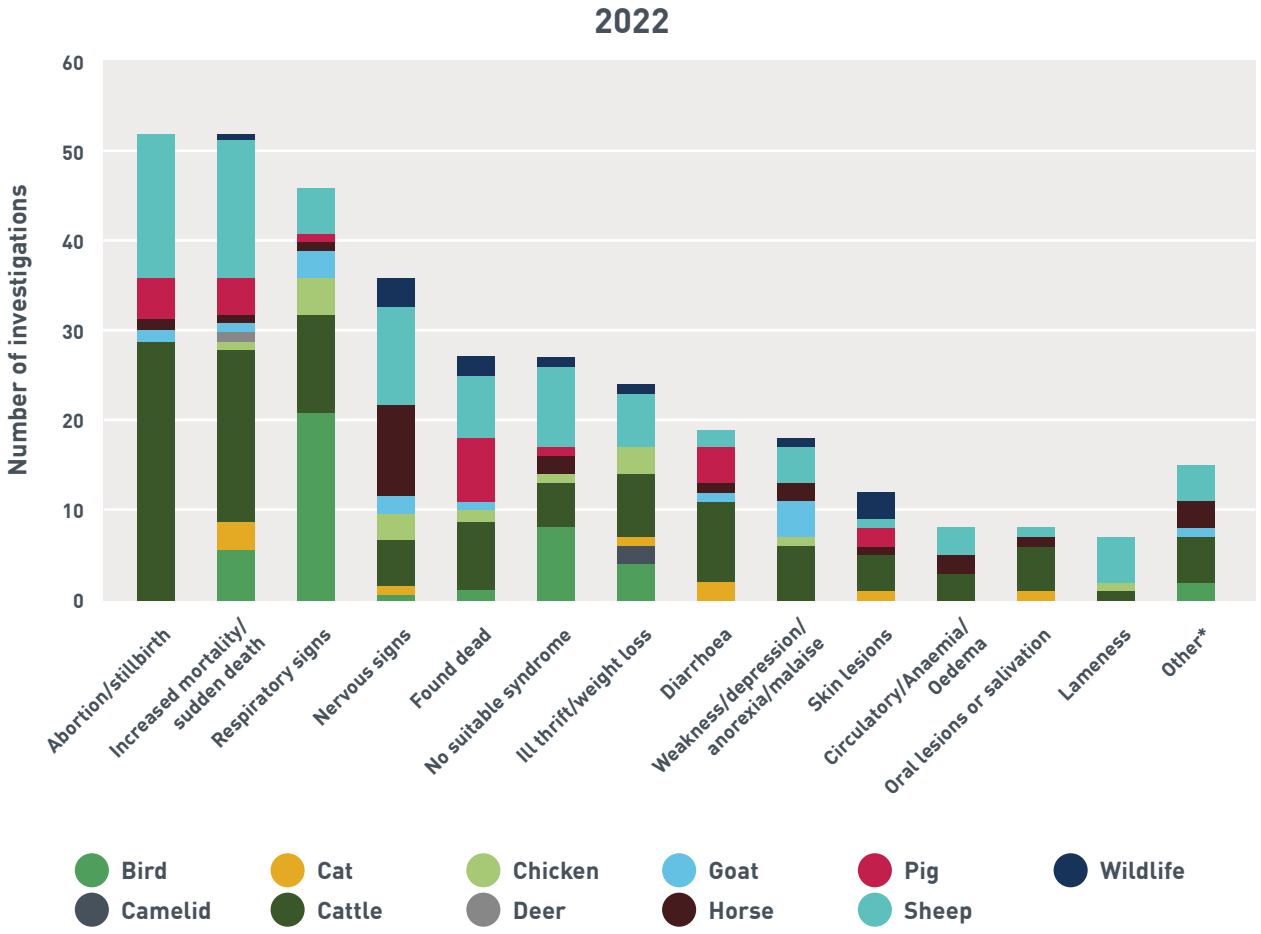
Australia has a long record of freedom from many of the significant diseases that affect animals in other parts of the world. Ongoing surveillance is vital in ensuring the early detection of diseases in livestock and wildlife. Private veterinary practitioners play a key role in general surveillance in Australia. The National Significant Disease Investigation Program provides funding to support private veterinary practitioners to undertake field work (e.g. clinical evaluation and/or necropsy, collection of diagnostic samples), laboratory diagnostic work and follow-up investigations. The program also provides support for training of veterinarians and biosecurity officers to increase confidence in Australia's capability to investigate and report on significant disease events.

During 2021–22, 351 disease investigations were financially supported by the National Significant Disease Investigation Program (Figure 2.11). The top three syndromes investigated were increased mortality and sudden death, abortion and stillbirth, and respiratory signs. The program also supported the development of new training materials, including webinars and a video on necropsy techniques.

7 animalhealthaustralia.com.au/industry-publications

8 namp.animalhealthaustralia.com.au/public.php

9 animalhealthaustralia.com.au/maintaining-access-to-arbovirus-sensitive-markets



*Other syndromes included alimentary signs other than diarrhoea, acute febrile disease, nasal discharge, generalised oedema, genital lesions, jaundice and production drop.

Figure 2.11 Number of investigations supported by the National Significant Disease Investigation Program, by syndrome and animal group, July 2021–June 2022

National Sheep Health Monitoring Project

The National Sheep Health Monitoring Project is funded by the sheep and wool industries and managed by AHA and monitors lines of sheep in abattoirs for several important animal health conditions.[10] The project generates a comprehensive, contemporary dataset that provides a snapshot of the animal health status of the Australian flock. Sheep carcasses and offal are monitored for a range of diseases and conditions which impact productivity, meat processing wastage and farm profitability. These data are important for highlighting regional variation and trends in the monitored conditions over time.

During 2021–22, a total of 8 418 939 sheep from 37 998 lines and 9255 property identification codes across 10 domestic and export abattoirs were inspected.

National Transmissible Spongiform Encephalopathies Surveillance Project

The National Transmissible Spongiform Encephalopathies (TSE) Surveillance Project is part of the TSE Freedom Assurance Program, which is managed by AHA with funding from industry stakeholders and all federal, state and territory governments. The TSE Freedom Assurance Program aims to increase market confidence that Australian animals and animal products are free from TSE.[11]

10 animalhealthaustralia.com.au/national-sheep-health-monitoring-project

11 animalhealthaustralia.com.au/maintaining-australias-freedom-from-tses

Credit: Wool Producers Australia

The national TSE Surveillance Project provides early detection of bovine spongiform encephalopathy (BSE) and classical scrapie (should they occur) and demonstrates Australia's ability to meet the requirements for negligible risk status for BSE and free status for classical scrapie. The program involves testing samples from cattle, sheep and goats with clinical signs consistent with BSE or classical scrapie. Opportunistic sampling of fallen and casualty slaughter cattle, sheep and goats is also undertaken. In 2022, Australia maintained freedom from classical scrapie and continued to be recognised by the WOAH as a country of negligible risk for BSE. Australia's targeted surveillance program is consistent with WOAH requirements, and data are submitted to WOAH each year to reconfirm Australia's disease-free status. During 2021–22, 410 cattle, 328 sheep and 20 goats were examined as part of the program. All samples tested negative for BSE and classical scrapie.

Screw-Worm Fly Surveillance and Preparedness Program

Screw-worm fly (SWF) is an insect pest of warm-blooded animals. SWF is capable of infesting livestock, wildlife and humans. While SWF is not present in Australia, AHA maintains a national surveillance and preparedness program in partnership with industry and government stakeholders due to its regional proximity.[12] The program focuses on early detection and preparedness through fly trapping, targeted surveys for myiasis, entomology training, reference resources and monitoring the risk profile. It also supports general surveillance in animals for myiasis of both Old World screw-worm fly (*Chrysomya bezziana*) and New World screw-worm fly (*Cochliomyia hominivorax*).

12 animalhealthaustralia.com.au/monitoring-for-swf

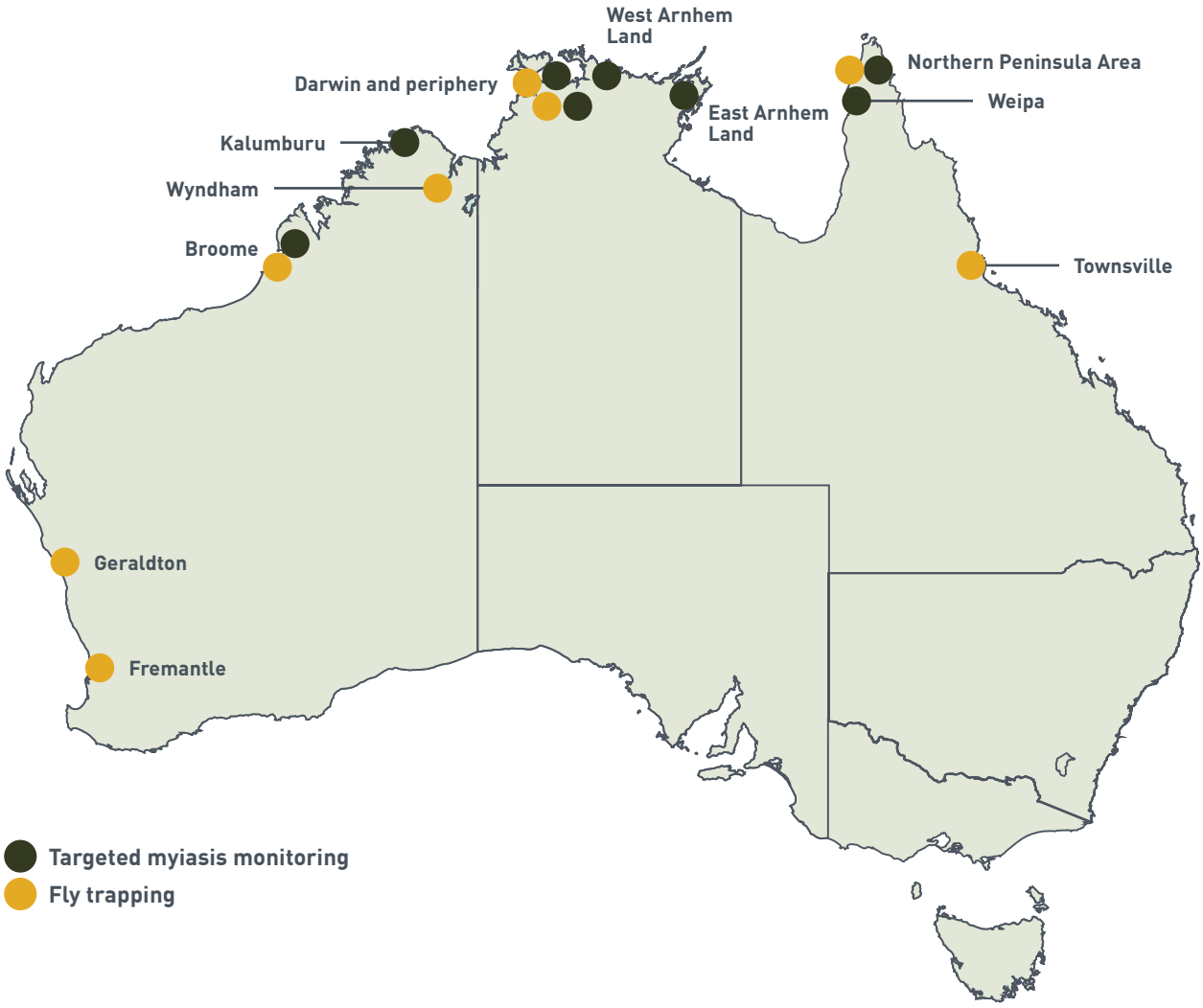


Figure 2.12 Locations of targeted myiasis monitoring and fly trapping in the Screw-Worm Fly Surveillance and Preparedness Program, 2022

During 2022, 221 fly trapping events were undertaken across 21 sites within 8 locations. There were 117 targeted myiasis monitoring events at 11 sites within 8 locations (Figure 2.12). In October, a workshop was held in Darwin to increase expertise in SWF identification among Australian entomologists and parasitologists. Targeted communications materials were developed and distributed to veterinarians and other key animal health stakeholders in northern Australia.

Evidence of Absence Surveillance Project

The Evidence of Absence Surveillance Project strengthens Australia's substantiation of freedom from important exotic pig diseases through increased surveillance of pigs showing clinical syndromes of interest. The project was initiated and funded by Australian Pork Limited in consultation with specialist pig veterinarians and is delivered by AHA.

The program targets significant diseases of pigs that are exotic to Australia: porcine reproductive and respiratory syndrome, porcine epidemic diarrhoea virus, transmissible gastroenteritis, Aujeszky's disease, porcine teschovirus encephalomyelitis (formerly porcine enterovirus encephalomyelitis), African swine fever and classical swine fever. Published guidelines describe the clinical syndromes associated with each of these diseases and the samples that participating

veterinarians should submit for laboratory testing.[13] The program has resulted in an increase in exclusion testing for relevant pig diseases, and summary records are collated as part of Australia's National Animal Health Information Program.

Northern Australia Quarantine Strategy

In 2022, the Northern Australia Quarantine Strategy (NAQS) continued to deliver its targeted and general surveillance to support proof of freedom and the early detection of exotic pests and diseases that may establish in northern Australia through natural or human-mediated pathways. Please see the *Animal Health in Australia System Report*[14] for further information on the role of NAQS.

With the outbreak of Japanese encephalitis in the south-eastern states in 2022, NAQS continued its targeted surveillance for JEV within its feral animal surveillance activities, to assist the northern jurisdictions with demarcating virus distribution.

The Northern Territory Government's Berrimah Veterinary Laboratory collaborated with NAQS, which enabled refinements in sample collection and virus detection. Outcomes from this work were then deployed across the other two northern jurisdictions where NAQS operates. NAQS also worked alongside relevant health departments to guide mosquito and vaccination strategies. During 2022, NAQS detected 52 feral animals that were PCR positive for JEV, 61 seropositive for JEV and 641 with serological evidence of exposure to flavivirus, Murray Valley encephalitis virus or Kunjin virus.

In 2022, 15 surveys of feral animals were conducted across 20 regions of northern Australia (Figure 2.13). Most animals sampled were feral pigs (n = 1227). Not only are feral pigs relatively abundant compared to other feral animal species found in northern Australia, they also have the potential to host a wide range of exotic animal pests and diseases.

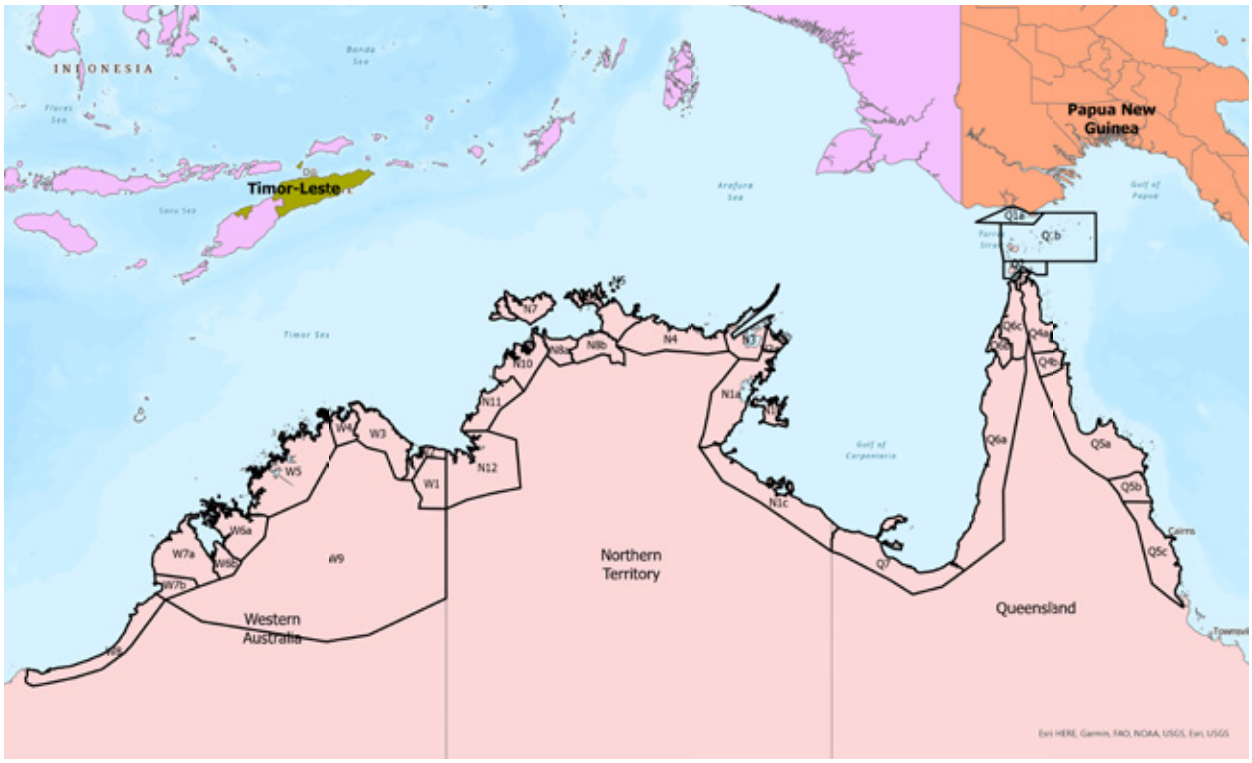


Figure 2.13 Northern Australia Biosecurity Surveillance region

13 animalhealthaustralia.com.au/enhanced-surveillance-for-significant-exotic-diseases-of-pigs

14 animalhealthaustralia.com.au/ahia

In addition to targeted feral animal health surveillance, NAQS also delivers targeted surveys of domestic animals in the Torres Strait and Northern Peninsula Area of Queensland. This includes routine sample collection and testing for a number of diseases exotic to Australia. As for feral animal surveys, any abnormal clinical signs or pathology detected during these surveys undergo further diagnostic work-up and exotic disease exclusion testing (Table 2.3).

Please see the 2021 *Animal Health in Australia Annual Report*[15] for further details of ongoing NAQS programs and collaborators.

Table 2.3 Count of northern Australian healthy feral animals tested for serological exposure to exotic diseases that may have a natural pathway of introduction

Pathogen tested	Count of animals
African swine fever	1051
Aujeszky's disease (pseudorabies virus)	1054
Classical swine fever	1054
Lumpy skin disease	40
Surra	1099

Additionally, NAQS conducted 28 disease investigations in feral animals exhibiting clinical signs suggestive of exotic diseases including foot and mouth disease (n=1 pig), African swine fever (n=2 pigs), classical swine fever (n=2 pigs), influenza A (n=1 pig) and lumpy skin disease (n=9 feral bovids).

Table 2.4 Wildlife disease investigation events in Australia in 2022

Animals	Number of investigations[a]
Bats	300
Birds	272
Marsupials	134
Feral mammals[b]	46
Marine turtles	31
Marine mammals	21
Snakes and lizards	16
Amphibians	10
Freshwater turtles	9
Monotremes	9
Fish	3
Other mammals	3
Crocodiles	1

a Two events involved multiple taxonomic groups, so the total number of events does not equal 852.

b Feral pigs (*Sus scrofa*), feral horse (*Equus caballus*), feral cattle (*Bos taurus* and *Bos iavanicus*), Asiatic water buffalo (*Bubalus arnee*), feral goat (*Capra hircus*), European rabbit (*Oryctolagus cuniculus*) and red deer (*Cervus elaphus*).

15 animalhealthaustralia.com.au/ahia

Wildlife health surveillance

Australia's general wildlife health surveillance system is administered by Wildlife Health Australia (WHA) in partnership with government agencies and non-government organisations. During 2022, 852 wildlife disease investigation events were added to the national database (Table 2.4). Approximately 32% of these events involved bats, bird events accounted for a 35% of investigations reported, and 16% related to marsupials.

In 2022, WHA received reports of 300 investigations of wild bird disease events from around Australia. No wild bird mortality events were attributed to avian influenza virus (AIV) or West Nile virus. Pigeon paramyxovirus (PPMV-1) was attributed as the cause of mortality events involving feral pigeons and doves. AIV and avian orthoavulavirus 1 (AOAV-1) were excluded by PCR testing in 129 and 116 of the 2022 events respectively. AIV and AOAV-1 exclusion testing was not warranted in the remaining events on the basis of clinical signs, history, prevailing environmental conditions or other diagnoses.

Findings in wild bird events in 2022 included: aspergillosis, avian pox, botulism, *Chlamydia psittaci* infection, *Clostridium perfringens* infection, coccidiosis, cryptosporidiosis, leucocytozoonosis, *Macrorhabdus ornithogaster* infection, malaria, psittacine beak and feather disease, *Salmonella* infection, spironucleosis, trichomoniasis toxicity (environmental, heavy metal, rodenticides and pesticides) and toxoplasmosis.

Most bat investigations involved individual bats submitted for testing for Australian bat lyssavirus (ABLV), usually following potentially infectious contact with a human or pet. A total of 258 bats were tested for ABLV in 2022. Of these, 11 flying foxes from New South Wales, Northern Territory, Queensland, South Australia and Victoria and one microbat from Queensland, were found to be infected with ABLV. There were no detections of ABLV infection in species other than bats. Regular reports on the status of ABLV in Australia are published by the WHA Bat Health Focus Group.[16]

Significant wildlife health incidents in Australia are reported in *Animal Health Surveillance Quarterly*[17] and the WHA website.[18]

16 wildlifehealthaustralia.com.au/ProgramsProjects/BatHealthFocusGroup.aspx

17 sciquest.org.nz/browse/publications/view/114

18 wildlifehealthaustralia.com.au/DiseaseIncidents/OngoingIncidents.aspx

National Avian Influenza Wild Bird Surveillance Program

Through the National Avian Influenza Wild Bird Surveillance Program,[19] targeted (pathogen-specific, risk-based) surveillance was conducted by sampling apparently healthy, live and hunter-shot wild birds at sites in seven states and territories across Australia (Figure 2.14). A total of 5788 faecal environmental and cloacal swabs collected from waterbirds were tested for AIVs in 2022.

As part of general surveillance, AIV and AOAV-1 were also excluded in wild bird morbidity and mortality events (see 'Wildlife health surveillance' section).

No HPAI viruses were identified. However, surveillance activities continue to show evidence of a wide range of subtypes of AI viruses of low pathogenicity including H1, H2, H4, H3, H5, H6, H7, H8, H9, H10 and H11.

Further information on the National Avian Influenza Wild Bird Surveillance Program is available on WHA's website,[20] and in the Avian Influenza in Wild Birds fact sheet and Wild Bird Newsletter.[21]

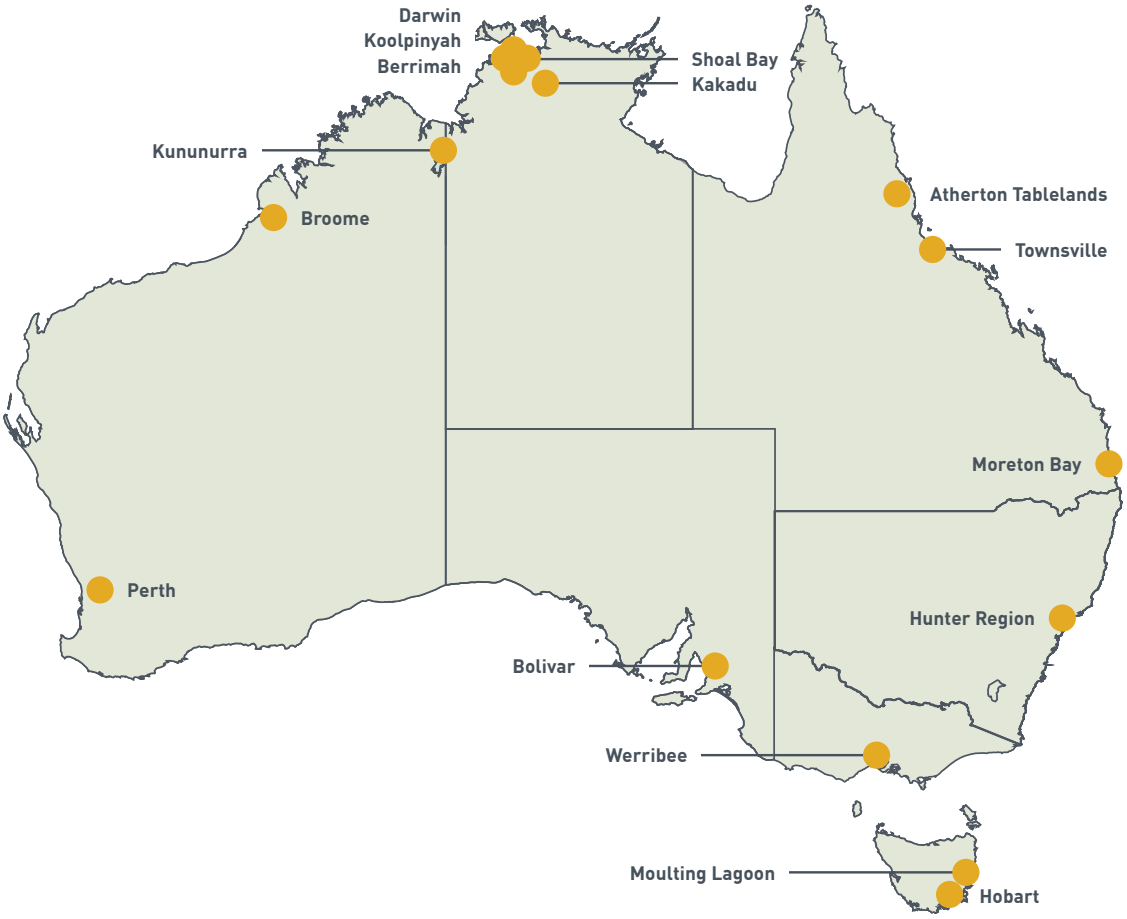


Figure 2.14 AIV targeted surveillance key sampling locations*

*This map shows locations where the majority of wild bird samples are collected from, on a regular basis. Locations sampled irregularly or where small numbers of samples are collected are not represented on the map.

19 wildlifehealthaustralia.com.au/ProgramsProjects/WildBirdSurveillance.aspx

20 wildlifehealthaustralia.com.au/ProgramsProjects/WildBirdSurveillance.aspx

21 wildlifehealthaustralia.com.au/Portals/0/Documents/FactSheets/Avian/Avian_Influenza_in_Wild_Birds_in_Australia.pdf

CASE STUDY

Global situation on high pathogenicity avian influenza and risk to Australian birds

Since 2021–2022, HPAI H5N1 clade 2.3.4.4b has caused ongoing outbreaks of disease in wild birds throughout much of North America, Europe, Asia and Africa. More recently, it has spread to South America. Mortalities have been observed in multiple wild bird species, including individual and mass mortalities. HPAI has also been detected in apparently healthy waterbirds, and H5N1 strains have been detected in wild mammals.

HPAI H5 has not been detected in Australia. All historical HPAI outbreaks in Australia have been in commercial poultry operations (all eradicated) following the spillover and subsequent evolution of LPAI H7 viruses found in Australian wild birds.

While previous research has determined the risk of HPAI strains entering Australia via migratory birds to be low, the current global situation means a likely increased level of risk to Australia. Migratory shorebirds that come to Australia can be exposed to HPAI before arriving in the country. However, there is no evidence that they carry infectious HPAI viruses when they arrive in Australia. With the return of migratory birds from the Northern Hemisphere to Australia from September to November, there was a higher likelihood during that period for introduction of HPAI viruses into Australia compared to previous years.

Investigation of mass mortalities in wild birds is important, and in addition to detecting or excluding avian influenza and other nationally notifiable diseases, it is crucial to conduct further investigation and diagnostic testing to identify the cause. Comprehensive investigation of wild bird mortalities provides better understanding of the drivers of such events. During 2022, AIVs were specifically excluded in over 129 wild bird mortality events (as reported above). These events involved over 83 different species from 15 different bird orders. The events included mortality in known reservoir species of waterfowl and shorebirds, mass mortality events in waterbirds, and many individual sick or dead raptors, which are highly susceptible to disease caused by HPAI. No wild bird mortality due to AIVs was reported in 2022.

For more information, see WHA's National Avian Influenza Wild Bird Steering Group update.[22]

22 wildlifehealthaustralia.com.au/Portals/0/Documents/ProgramProjects/2022_02_NAIWB_TechnicalssueUpdate_NthHemisphere_HPAI.pdf

Antimicrobial resistance surveillance

Antimicrobial resistance (AMR) is one of the biggest threats to both human and animal health today. Monitoring AMR in Australia through surveillance activities allows us to make informed decisions about stewardship practices which help mitigate the risk of AMR. It also aids the development of communication tools to ensure that everyone understands the risk and their role in preventing AMR.

In 2022, a survey to reassess the prevalence of AMR against key indicator and foodborne pathogens in the chicken meat industry was completed. This study used methods that align with chapter 6.8 of the WOAH Terrestrial Animal Code and other nationally funded AMR surveillance in livestock. The results showed a decrease in the prevalence of AMR compared to the previous (2016) study and AMR carriage was generally low, if present at all, in comparison to other countries. These results demonstrate the positive impact of the Australian chicken meat industry's antimicrobial stewardship program.

Veterinarians' knowledge, attitudes and practices towards antimicrobial prescribing

With funding from the Department of Agriculture, Fisheries and Forestry, the University of

Melbourne surveyed veterinarians and their clients to gather information on antimicrobial prescribing.

The two primary objectives were to understand:

- the attitudes and factors that influence Australian veterinarians' antimicrobial prescribing behaviour
- the levels of health literacy in veterinary clients and animal owners/managers and their expectations and attitudes towards antimicrobial prescribing.

In general, veterinarians were aware of the risk of AMR, and their prescribing behaviours were intended to mitigate the risk (e.g. by ensuring the full course of antimicrobials was completed and using more efficacious drugs off-label). However, it was clear more research is needed to ensure these methods are effective.

The study found that clients held their veterinarians in high regard, and although they often expected antimicrobials to be prescribed, they respected the veterinarian's decision if antimicrobials were not prescribed.

The results from this survey will inform the development of communication and educational material that can guide veterinarians in their decisions and, where necessary, encourage behavioural change.

3

Aquatic animal health status

3.1 Status of aquatic animal health in Australia

This chapter provides details on the status of aquatic animal health in Australia including disease events in 2022. In 2022, the World Organisation for Animal Health (WOAH) included 11 fish diseases, 7 mollusc diseases, 10 crustacean diseases and 3 amphibian diseases on its diseases of aquatic animals list. Australia is free from most of these diseases. Australia's status for each WOAH-listed aquatic animal disease in 2022 is shown in Table 3.1. For WOAH-listed diseases that are present, the maps in Figure 3.1 indicate the states and territories where diseases have been reported.

Table 3.1 Australia's status for WOAH-listed diseases of aquatic animals in 2022

Agent	Status
Fish	
***Aphanomyces invadans* (epizootic ulcerative syndrome)**	Reported 2022
Cyprinid herpesvirus-3 (Koi herpes virus)	Never reported
Epizootic haematopoietic necrosis virus	Reported 2022
Gyrodactylus salaris	Never reported
HPR-deleted or HPR0 infectious salmon anaemia virus	Never reported
Infectious haematopoietic necrosis virus	Never reported
Red sea bream iridovirus	Never reported
Salmonid alphavirus	Never reported
Spring viraemia of carp virus	Never reported
Tilapia Lake virus	Never reported
Viral haemorrhagic septicaemia virus	Never reported
Mollusc	
Bonamia ostreae	Never reported
Bonamia exitiosa	Last reported 2017
Haliotid herpesvirus-1 (Abalone herpesvirus)	Reported 2022
Marteilia refringens	Never reported
Perkinsus marinus	Never reported
Perkinsus olseni	Reported 2022
Xenohaliotis californiensis	Never reported
Crustacean	
***Aphanomyces astaci* (crayfish plague)**	Never reported
Decapod iridescent virus 1	Never reported

Continued

Agent	Status
Hepatobacter penaei **(necrotising hepatopancreatitis)**	Never reported
Infectious hypodermal and haematopoietic necrosis virus	Last reported 2020
Infectious myonecrosis virus	Never reported
Macrobrachium rosenbergii **nodavirus (white tail disease)**	Last reported 2008
Taura syndrome virus	Never reported
Vibrio parahaemolyticus **(acute hepatopancreatic necrosis disease)**	Never reported
White spot syndrome virus	Reported 2022
Yellow head virus genotype 1	Never reported
Amphibian	
Batrachochytrium dendrobatidis	Reported 2022
Batrachochytrium salamandrivorans	Never reported
Ranavirus species	Last reported 2008

Notes: Aquatic animal diseases that were reportable to the WOAH in 2022 are those listed in the WOAH *Aquatic Animal Health Code (2022)*.

3.2 National List of Reportable Diseases of Aquatic Animals

Australia's National List of Reportable Diseases of Aquatic Animals includes all the aquatic animal diseases currently listed by WOAH and other aquatic animal diseases of national significance. Consistent and accurate reporting is important to demonstrate Australia's claims of freedom from diseases of international significance — to support trade of seafood products and our biosecurity measures. Our disease reporting demonstrates transparency to trading partners and a commitment to disease management and biosecurity. Australia reviews its list annually, taking into account new scientific information on listed diseases and new and emerging diseases.

Table 3.2 shows Australia's status for other aquatic animal diseases of national significance that are not reportable to the WOAH for 2022.

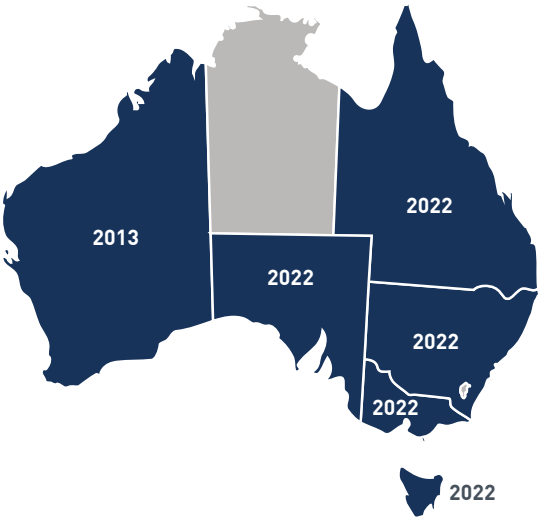
Table 3.2 Australia's status for other significant diseases of aquatic animals in 2022

Infection	Status
Fish	
Aeromonas salmonicida – atypical strains	Last reported 2021
Aeromonas salmonicida subsp. *salmonicida* (furunculosis)	Never reported
Betanodavirus (viral encephalopathy and retinopathy)	Reported 2022
Edwardsiella ictaluri (enteric septicaemia of catfish)	Last reported 2014
Infectious spleen and kidney necrosis virus	Last reported 2020
Infectious pancreatic necrosis virus	Never reported
Myxobolus cerebralis (whirling disease)	Never reported
Piscirickettsia salmonis (piscirickettsiosis)	Never reported
Renibacterium salmoninarum (bacterial kidney disease)	Never reported
Scale drop disease virus	Never reported
Singapore grouper iridovirus (ranavirus)	Never reported
Turbot reddish body iridovirus	Never reported
Yersinia ruckeri – Hagerman strain (enteric redmouth disease)	Never reported
Mollusc diseases	
Marteilia sydneyi	Reported 2022
Marteilioides chungmuensis	Never reported
Mikrocytos mackini	Never reported
Ostreid herpesvirus-1	Reported 2022
Crustacean diseases	
Enterocytozoon hepatopenaei	Never reported
Gill-associated virus	Last reported 2020
Monodon slow growth syndrome	Never reported

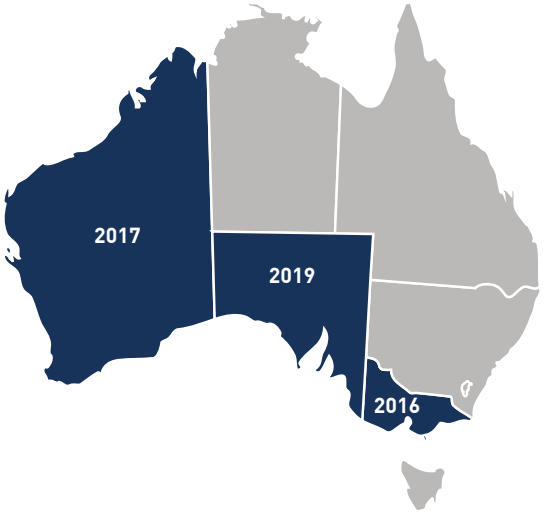
Haliotid herpesvirus-1 (Abalone herpesvirus)

***Aphanomyces invadans* (epizootic ulcerative syndrome)**

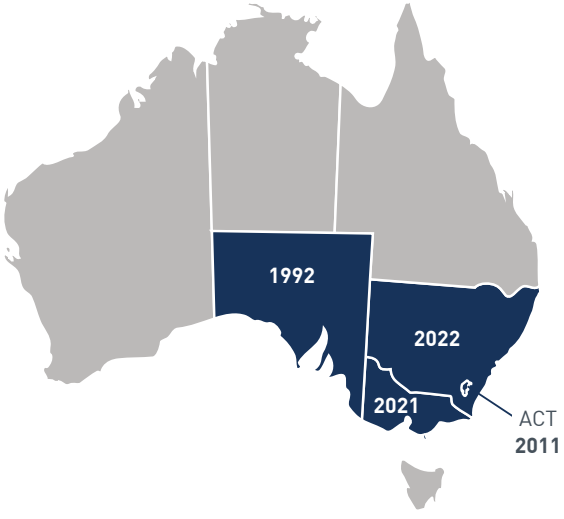
Batrachochytrium dendrobatidis



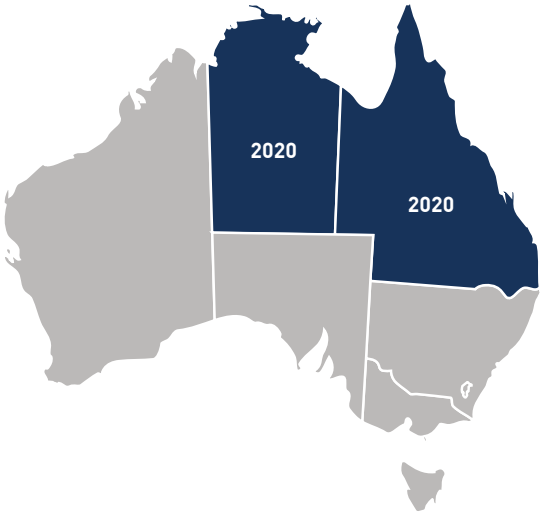
Bonamia exitiosa



Epizootic haematopoietic necrosis virus



Infectious hypodermal and haematopoietic necrosis virus



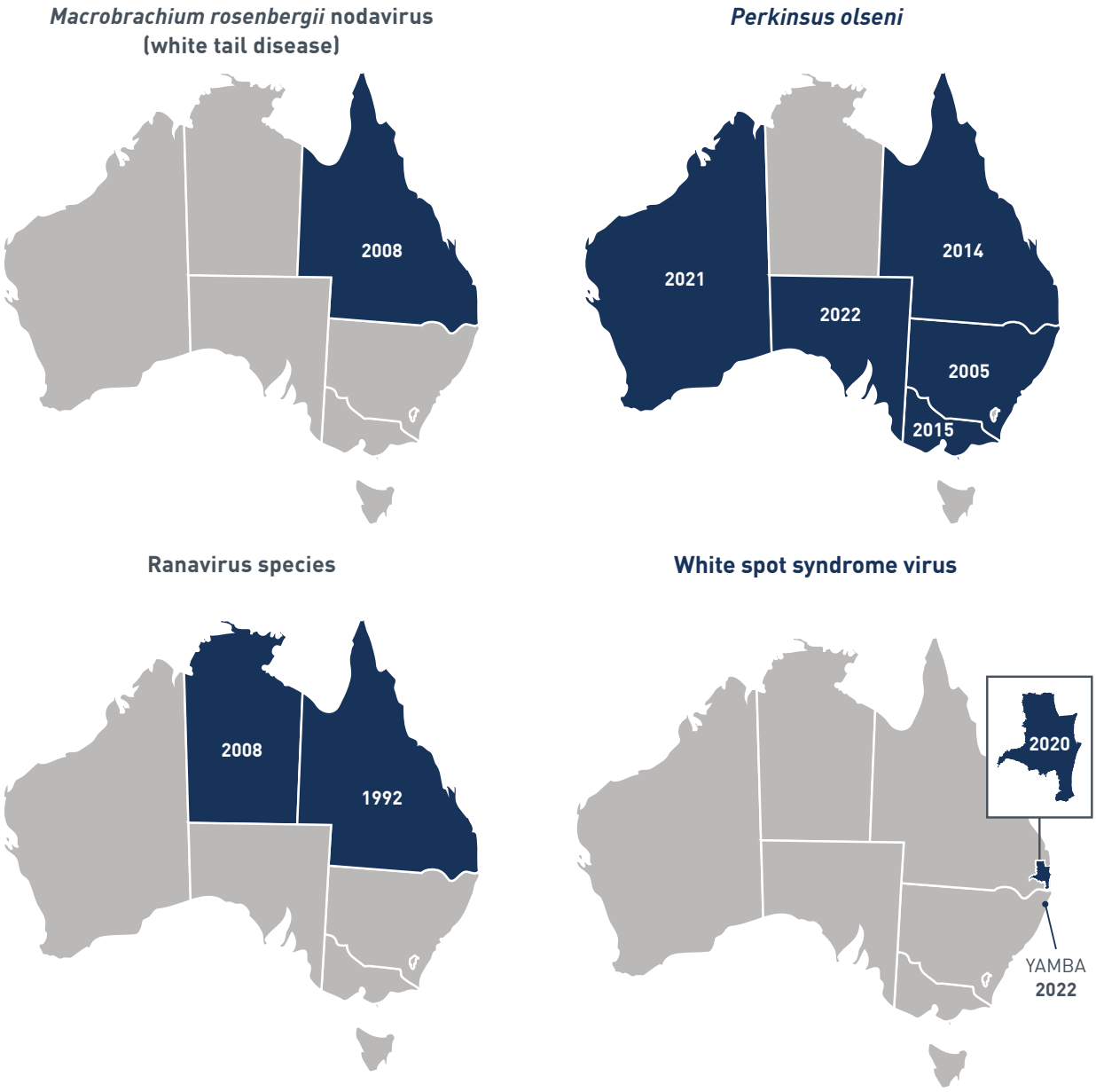


Figure 3.1 Distribution of WOAH-listed aquatic animal diseases in Australia

3.3 National exotic disease exclusion testing of aquatic animals in 2022

During 2022, national exotic disease exclusion testing of aquatic animals was conducted by the Australian Centre for Disease Preparedness (ACDP), which is the national reference laboratory for diseases of aquatic animals. The purpose of the testing was to detect or exclude nationally reportable diseases (Figures 3.2 to 3.5).

3.4 Aquatic animal disease events in 2022

White spot syndrome virus in *Penaeus monodon* broodstock, New South Wales

In August 2022, white spot syndrome virus (WSSV) was detected in black tiger prawn broodstock (*Penaeus monodon*). The detection occurred during routine testing at a biosecure facility on a prawn farm in northern New South Wales. The small number of prawns in the affected facility were wild caught broodstock that were newly introduced to the facility. Retesting and confirmation testing was undertaken by New South Wales Animal and Plant Health Laboratories at Elizabeth Macarthur Agricultural Institute and the ACDP respectively. The Department of Agriculture, Fisheries and Forestry notified WOAH of the incident in line with Australia's international obligations.

WSSV causes white spot disease (WSD) and is a major biosecurity threat for prawns and other crustaceans. Prior to this detection, WSSV had never been detected in New South Wales but had previously been detected in South East Queensland between 2016 and 2020. The affected area in Queensland remains under movement and fishing activity restrictions to prevent further spread of WSSV. An ongoing national surveillance program that commenced in 2017 demonstrated that all other areas outside of the movement-regulated area have remained free from WSSV.

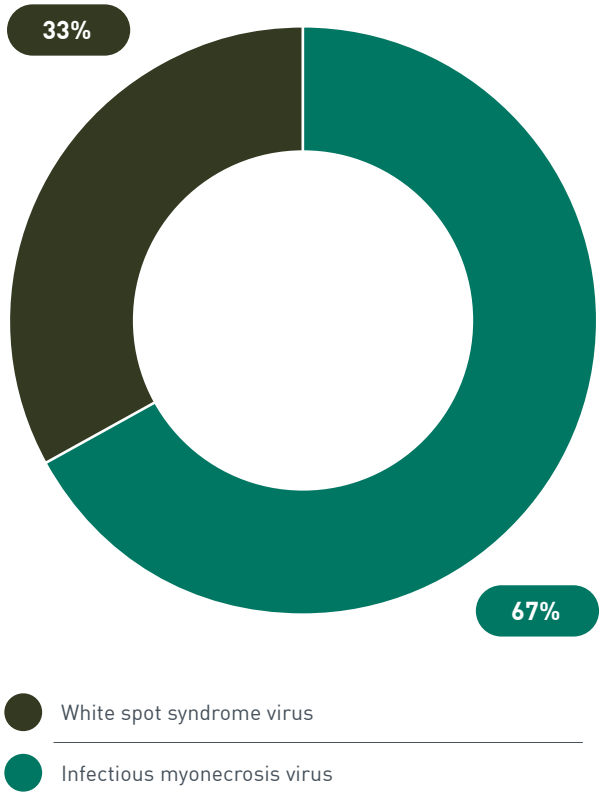


Figure 3.2 National reportable disease investigations of crustaceans in 2022

The New South Wales WSSV incident was managed through an emergency response, with the New South Wales Department of Primary Industries standing up a formal Incident Management Team. At the affected facility, broodstock breeding activities had not commenced and all the prawns at the facility were destroyed with oversight by authorised officers. AQUAVETPLAN manuals provided technical guidance on destruction, disposal and decontamination activities. Decontamination of the facility was completed by 2 September 2022 under the supervision of biosecurity officers culminating in the successful eradication of WSSV at the infected premises. The farm was released from biosecurity restrictions on 6 September 2022.

Surveillance and tracing activities to determine the potential source of the virus included testing penaeid prawns sampled from waterways in the vicinity of the farm, and off the New South Wales coast, where some of the broodstock had been sourced. All of these test results were negative for WSSV. Other jurisdictions tested bait prawns sourced from northern New South Wales, and these also returned negative results.

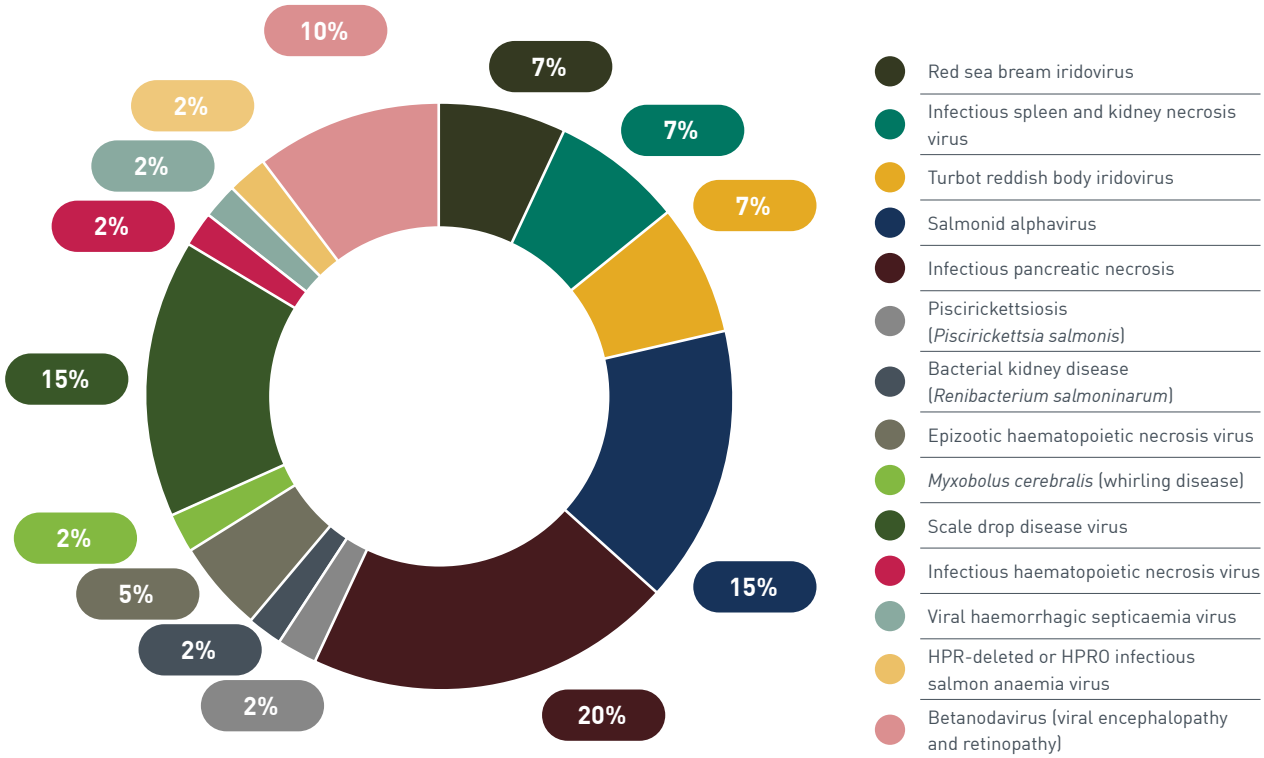


Figure 3.3 National reportable disease investigations of fish in 2022

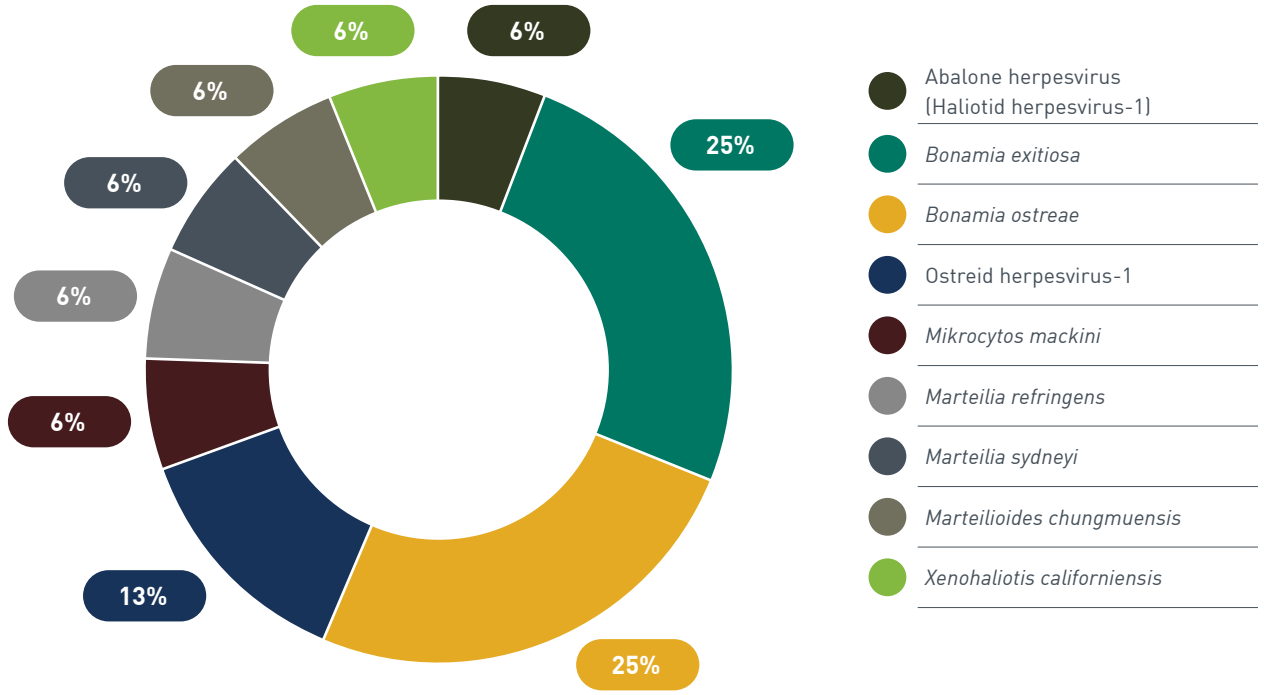


Figure 3.4 National reportable disease investigations of molluscs in 2022

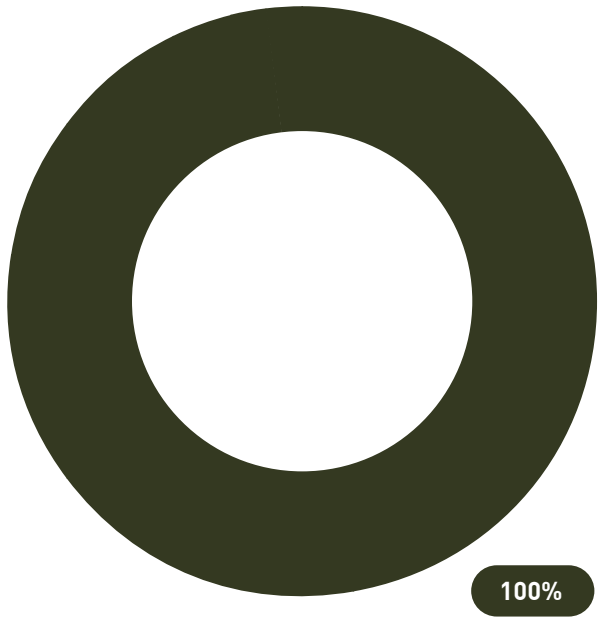


Figure 3.5 National reportable disease investigations of amphibians in 2022

More than 6000 other prawn broodstock were tested as part of the prawn aquaculture industry's interstate translocation protocols during 2022, and all tested negative for WSSV. Frozen polychaete worms used for broodstock feed at the affected facility also tested negative.

Investigations of all potential entry pathways to the facility concluded that wild caught broodstock was the most likely entry pathway. However, it was not definitively determined how the broodstock became infected. ACDP's genetic analysis using whole-genome sequencing indicated that the virus detected in northern New South Wales was different to that detected in South East Queensland, and likely to be of a separate origin. Further surveillance of wild prawn stocks off the northern New South Wales coast will be carried out by the Department of Primary Industries in early 2023 when environmental conditions will be conducive to detecting the virus.

The Aquatic Consultative Committee on Emergency Animal Disease (AqCCEAD) provided technical advice for the New South Wales-led response and surveillance activities. The infected premises was successfully decontaminated, and surveillance activities found no evidence of further spread of the virus beyond the facility. In September 2022, the Incident Management Team transitioned to a management phase and AqCCEAD stood down their response.

This response highlighted the efficacy of existing interstate surveillance testing protocols for WSSV to enable early detection, rapid response and eradication.

Betanodavirus in *Hippocampus abdominalis* (pot-bellied seahorse), Tasmania

On 25 March 2022, the Tasmanian Chief Veterinary Officer received notification from the state's Animal Health Laboratory of a suspected case of viral encephalopathy and retinopathy in a pot-bellied seahorse *Hippocampus abdominalis*. The case was from an aquarium facility that breeds and sells *H. abdominalis* to the domestic ornamental aquarium market and export markets. Affected tanks showed elevated mortality and moribund seahorses floating on the surface.

The initial diagnostic investigation by the Animal Health Laboratory showed vacuolation of the brain on histological examination. On 29 March 2022, a positive result on a reverse transcription polymerase chain reaction (PCR) test for viral encephalopathy and retinopathy was reported. On 1 April 2022, further diagnostic confirmation was received from ACDP.

Betanodaviruses are regionally reportable to WOAH and the Network of Aquaculture Centres in Asia-Pacific. Betanodaviruses are a national reportable disease of aquatic animals in Australia and are classified as a List A disease in Tasmania under the *Animal Health Act 1995*. The Department of Natural Resources and Environment notified the Australian Chief Veterinary Officer and the Department of Agriculture, Water and the Environment soon after confirmation of the viral encephalopathy

and retinopathy diagnosis. The AqCCEAD was not convened but informed of the case out of session. This is consistent with the preferred management approach for betanodavirus detections because these viruses are believed to be endemic. The recommended management requirements for betanodaviruses vary across jurisdictions as several betanodavirus isolates occur in Australia and some hydrogeographical areas (Australian Capital Territory, Victoria and southern Western Australia) remain free of this disease.

Tasmania's Department of Natural Resources and Environment undertook an investigation and stopped all movements of *H. abdominalis* from the affected facility. The affected tanks were culled by the owner on 3 April 2022. The Tasmanian government undertook tracing and identified a number of shipments that occurred during the disease outbreak period. Receiving premises and aquatic animal health authorities in Tasmania, New South Wales and Western Australia were notified. Some of the seahorses were sent to a biosecure research facility in New South Wales. All seahorses in the shipment sent to Western Australia died during transit. The remaining seahorses that were sent to a Tasmanian pet shop were collected for testing. The Department of Agriculture, Water and the Environment managed the export health certification requirements and declarations in relation to overseas shipments from the affected facility. There were no trade ramifications from this incident.

This was the first detection of betanodavirus in seahorses in Australia. There has been one other report of viral encephalopathy and retinopathy in *H. abdominalis* in China.[23] A phylogenetic analysis by ACDP of the current isolate indicated there was 95.3% shared identity with the Chinese isolate.

This incident highlights the efficacy of Australia's passive surveillance system for aquatic animal diseases.

3.5 Standard diagnostic procedure for white spot syndrome virus

Australian and New Zealand standard diagnostic procedures (ANZSDPs) are designed to standardise test procedures to ensure consistency between laboratories. They specify diagnostic methods that are selected for optimal accuracy, sensitivity, specificity and robustness. ANZSDPs aid in developing a quality assurance program that includes proficiency testing programs.

The ANZSDP for WSSV has been revised to replace the 2008 version. The latest edition harmonises with the WSSV chapter of the latest WOAH *Manual of Diagnostic Tests for Aquatic Animals* and includes additional information for the Australian and New Zealand context. The ANZSDP for WSSV[24] contains information on diagnostic methods for WSSV, including validation data on real-time PCR methods and corroborative diagnostic criteria for detection of WSSV.

23 Chen, X., Qi, J., He, L. et al. Isolation and identification of a new strain of nervous necrosis virus from the big-belly seahorse Hippocampus abdominalis. Virol J 19, 109 (2022). https://doi.org/10.1186/s12985-022-01837-8

24 agriculture.gov.au/agriculture-land/animal/health/laboratories/procedures/anzsdp/white-spot-disease

4

Appendix

Appendix – Livestock and aquatic industries in Australia

The data presented in this appendix has been sourced from the Australian Bureau of Agricultural and Resource Economics (ABARES) Agricultural Commodities Report (March 2023) and the Australian Bureau of Statistics (ABS) Agricultural Commodities Report for 2021-22 (as at 17 January 2023).

Table A1 Sheep and cattle numbers by state, 2021–22

	Unit	Qld	NSW	Vic.	SA	WA	Tas.	NT	ACT	National
Sheep	'000 head	2814	27 149	14 623	10 594	12 417	2567	0	71	70 235
Beef cattle	'000 head	10 794	4363	2185	958	1912	446	1587	5	22 250
Dairy cattle	'000 head	85	292	1290	94	88	299	-	-	2148

Source: Australian Bureau of Statistics.

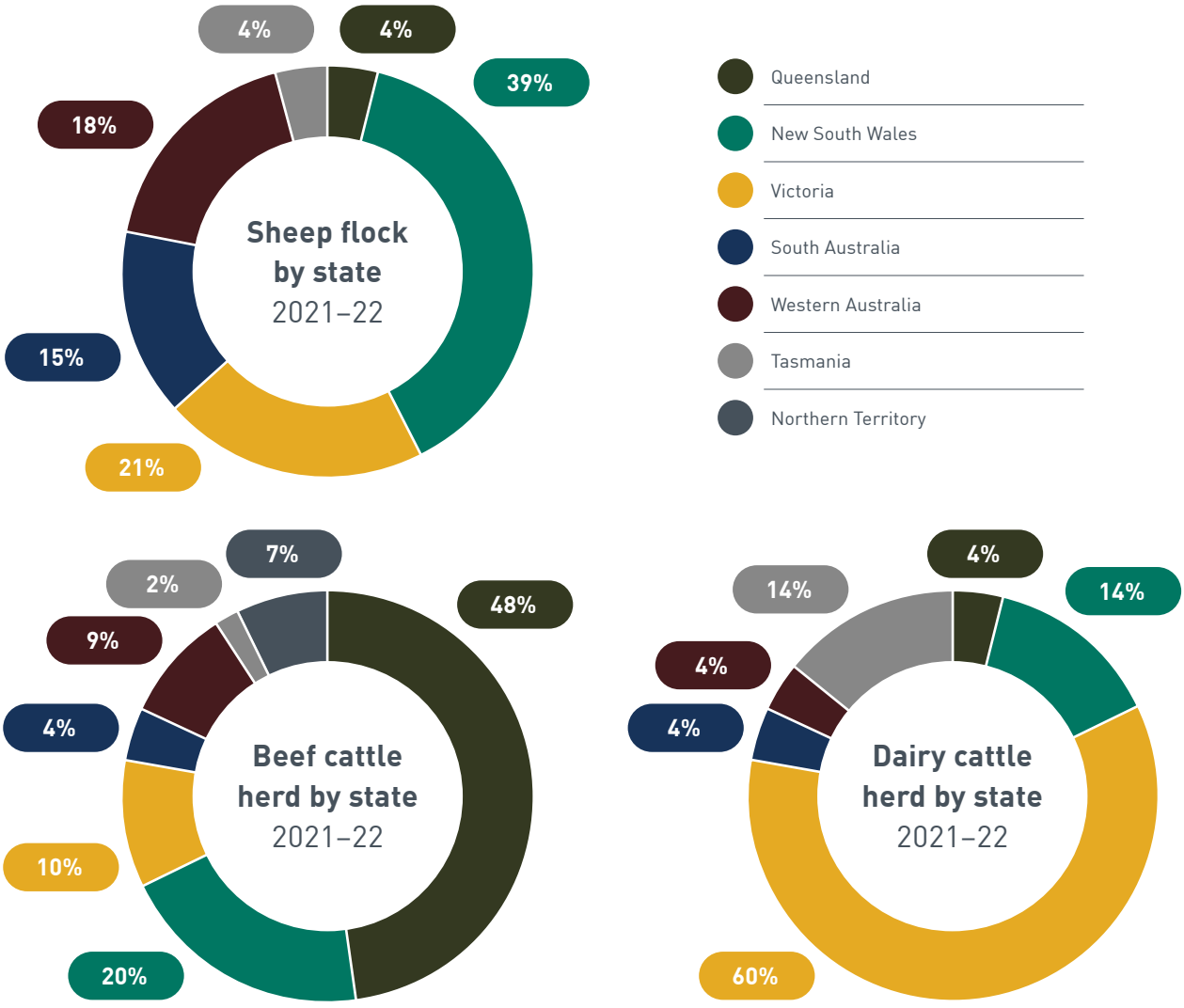


Figure A1 Sheep and cattle numbers by state, 2021–22

Table A2 Australian livestock statistics

	Unit	2019–20	2020–21	2021–22[a]
Livestock numbers				
Sheep	'000 head	63 529	68 047	70 235
Beef cattle	'000 head	21 142	22 048	22 250
Dairy cattle	'000 head	2361	2383	2148
Total Cattle	**'000 head**	**23 503**	**24 431**	**24 398**
Pigs	'000 head	2258	2578	2361
Livestock slaughterings				
Sheep	'000 head	8268	5403	6232
Lamb	'000 head	20 272	20 747	20 866
Cattle and calves	'000 head	8699	6621	6148
Pigs	'000 head	5167	5490	5502
Chickens	million	658	678	698
Goats	'000 head	1248	960	1460
Meat produced[b]				
Mutton	kt (cw)	208	142	164
Lamb	kt (cw)	482	515	513
Beef and veal	kt (cw)	2372	1933	1878
Pork	kt (cw)	403	432	439
Poultry	kt (cw)	1247	1292	1362
Goat meat	kt (cw)	19	16	24
Livestock products				
Wool[c]	kt (gr. eq.)	355	357	382
Milk[d]	ML	8797	8858	8554
Eggs	million dozen	359	401	336
Meat exports				
Mutton	kt (sw)	182	146	158
Lamb	kt (sw)	280	279	288
Beef and veal	kt (sw)	1290	981	940
Pig meat	kt (sw)	28	32	29

Continued

	Unit	2019–20	2020–21	2021–22[a]
Chicken meat	kt (sw)	43	32	54
Goat meat	kt (sw)	17	15	21
Kangaroo meat	kt (sw)	2	1	2
Camel meat	kt (sw)	2	0	1
Live animal exports				
Live sheep[e]	'000 head	1089	602	489
Live feeder/slaughter cattle[f]	'000 head	1239	780	520
Live breeder cattle[g]	'000 head	139	125	97
Live goats	'000 head	16	14	3
Live camels	head	352	696	661
Live buffalo	head	4285	0	2207
Gross value of livestock production				
Sheep[h]	$m	1044	707	863
Lamb[h]	$m	3636	3625	4067
Cattle and calves[h,i]	$m	12 693	13 465	15 321
Pigs[h]	$m	1519	1557	1565
Poultry	$m	2827	2927	3178
Goats	$m	162	134	214
Cattle exported live[j]	$m	1878	1507	1188
Sheep exported live[e]	$m	157	93	85
Goats exported live	$m	6	7	2
Wool[c]	$m	3065	2645	3230
Milk[k]	$m	4829	4688	4872
Eggs	$m	881	1124	967

a ABARES estimate.
b Includes carcase equivalent of canned meats.
c Includes shorn wool (includes crutching) dead and fellmongered wool and wool exported on skins.
d Includes the whole milk equivalent of farm cream intake.
e Includes breeding stock.
f Includes buffalo.
g Includes dairy cattle and buffalo.
h Excludes skin and hide values.
i Includes dairy cattle slaughtered.
j Includes all bovine for feeder/slaughter breeding and dairy purposes.
k Milk intake by factories and valued at the farm gate.
Source: Australian Bureau of Statistics.

Table A3 Australian fisheries production

	Unit	2018–19	2019–20	2020–21
Volume of fisheries production				
Tuna	kt	12	12	12
Salmonids[a]	kt	58	67	84
Other fish	kt	116	126	130
Prawns	kt	25	25	25
Rock lobster	kt	10	8	10
Crab	kt	4	4	4
Other crustaceans	kt	1	1	1
Abalone	kt	3	3	3
Scallop	kt	7	7	5
Oyster	kt	9	9	11
Squid	kt	2	1	2
Other molluscs	kt	7	6	6
Other not included elsewhere	kt	16	5	5
Total	**kt**	**269**	**274**	**300**
Value of fisheries production				
Tuna	$m	161	178	129
Salmonids[a]	$m	839	904	1031
Other fish	$m	568	630	579
Prawns	$m	374	370	396
Production not included elsewhere[b]	$m	701	523	404
Crab	$m	57	52	54
Other crustaceans	$m	27	25	24
Abalone	$m	170	140	120
Scallop	$m	16	18	16
Oyster	$m	111	114	138
Squid	$m	14	13	16
Other molluscs	$m	134	124	130
Other not included elsewhere	$m	37	42	51
Total	**$m**	**3210**	**3134**	**3088**

Continued

	Unit	2018–19	2019–20	2020–21
Exports of fisheries production				
Seafood products - volume	kt	46	56	63
Seafood products - value	$m	1444	1331	1162
Other marine products - value	$m	88	84	92

a Includes salmon and trout production.

b Includes aquaculture production not elsewhere specified because of confidentiality restrictions. In Victoria, this includes warmwater finfish, ornamental fish, other shellfish, shrimps and aquatic worms.

Sources: ABARES; Australian Fisheries Management Authority; Australian Bureau of Statistics; Australian Government Department of Agriculture, Fisheries and Forestry; Department of Fisheries, Western Australia; Department of Primary Industries, New South Wales; Department of Primary Industries, Parks, Water and Environment, Tasmania; Fisheries Queensland; Fisheries Victoria, Department of Environment and Primary Industries; Northern Territory Department of Primary Industry and Fisheries; Primary Industries and Regions, South Australia; South Australian Research and Development Institute.

Table A4 Australian aquaculture production[a]

	Unit	2018–19	2019–20	2020–21
Volume				
Fish				
Salmonids[b]	kt	58	67	84
Tuna	kt	8	8	8
Silver perch	kt	0	0	0
Barramundi	kt	3	4	8
Other[c]	kt	4	4	4
Total	**kt**	**74**	**83**	**104**
Crustaceans				
Prawns	t	4794	6740	8727
Yabby	t	28	14	8
Marron	t	63	57	59
Redclaw	t	45	62	33
Total	**t**	**4930**	**6872**	**8826**
Molluscs				
Edible oyster	kt	9	9	11
Pearl oyster	kt	-	-	-
Abalone	kt	1	1	1
Blue mussel	kt	3	2	2
Total	**kt**	**14**	**13**	16
Production not included elsewhere[d]	kt	3	3	3
Value				
Fish				
Salmonids[b]	$m	839	904	1031
Tuna	$m	129	137	91
Silver perch	$m	3	2	2
Barramundi	$m	66	79	86
Other[c]	$m	55	55	53
Total	**$m**	**1092**	**1177**	**1264**

Continued

	Unit	2018–19	2019–20	2020–21
Crustaceans				
Prawns	$m	84	134	160
Yabby	$m	1	1	0
Marron	$m	2	2	2
Redclaw	$m	1	2	1
Total	**$m**	**88**	**139**	**163**
Molluscs				
Edible oyster	$m	111	114	138
Pearl oyster	$m	72	71	71
Abalone	$m	21	22	28
Blue mussel	$m	7	6	6
Total	**$m**	**212**	**214**	**243**
Production not included elsewhere[d]	$m	31	35	34

a Excludes hatchery production, crocodiles, microalgae and aquarium worms.

b Includes salmon and trout production.

c Includes eel, other native fish and aquarium fish.

d Includes aquaculture production not elsewhere specified because of confidentiality restrictions. In Victoria, this includes warmwater finfish, ornamental fish, other shellfish, shrimps and aquatic worms.

Sources: ABARES; Australian Fisheries Management Authority; Australian Government Department of Agriculture, Fisheries and Forestry; Department of Fisheries, Western Australia; Department of Primary Industries, New South Wales; Department of Primary Industries, Parks, Water and Environment, Tasmania; Fisheries Queensland; Fisheries Victoria, Department of Environment and Primary Industries; Northern Territory Department of Primary Industry and Fisheries; Primary Industries and Regions, South Australia; South Australian Research and Development Institute.

Acronyms and Abbreviations

ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
ABLV	Australian bat lyssavirus
ACDP	Australian Centre for Disease Preparedness
AHA	Animal Health Australia
AHPB	Animal Health Policy Branch
AIV	avian influenza virus
AMR	antimicrobial resistance
ANZSDPs	Australian and New Zealand standard diagnostic procedures
AOAV	avian orthoavulavirus
AqCCEAD	Aquatic Consultative Committee for Emergency Animal Disease
AVG	abalone viral ganglioneuritis
BHV	bovine herpesvirus
BSE	bovine spongiform encephalopathy
BTV	bluetongue virus
BVDV	bovine viral diarrhoea virus
CCEAD	*Consultative Committee for Emergency Animal Disease*

EHV	equid herpesvirus
eIDs	electronic identification devices
EPPRD	Emergency Plant Pest Response Deed
FTA	free trade agreement
HPAI	high pathogenicity avian influenza
JEV	Japanese encephalitis virus
LPAI	low pathogenicity avian influenza
NAMP	National Arbovirus Monitoring Program
NAQS	Northern Australia Quarantine Strategy
NRM	Natural Resource Management
OCVO	Office of the Chief Veterinary Officer
PCR	polymerase chain reaction
PPMV	pigeon paramyxovirus
qPCR	quantitative polymerase chain reaction
RIS	Regulatory Impact Statement
RSPCA	Royal Society for the Prevention of Cruelty to Animals
SWF	screw-worm fly
TSE	transmissible spongiform encephalopathy
VFF	Victorian Farmers Federation
WHA	Wildlife Health Australia
WOAH	World Organisation for Animal Health
WSD	white spot disease
WSSV	white spot syndrome virus

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