Animal Health Surveillance QUARTERLY

Newsletter of Australia's National Animal Health Information Program

APRIL TO JUNE 2019

24
ISSUE 2

animalhealth AUSTRALIA

www.animalhealthaustralia.com.au

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Volume 24 • Issue 2
April to June 2019

Chief Veterinary Officer's foreword

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Editing: Viscarra Rossel & Associates.
Front cover photo: Shutterstock
ISSN 1445-9701

Animal Health Surveillance Quarterly is a veterinary science publication that provides a topical summary of animal health matters and reports of animal health surveillance activities undertaken in Australia during the previous 3-month period. As part of the National Animal Health Information Program (NAHIP), this report contributes to Australia's annual animal health report to the World Organisation for Animal Health (OIE).

Welcome to the second issue of *Animal Health Surveillance Quarterly* for 2019.

Australia's animal health and product integrity status are critical to enhance and sustain the livestock and aquatic industries' international and domestic markets. The Animal Biosecurity and Welfare (ABW) Program in Western Australia focuses on ensuring the quality and safety of the state's livestock products through general and targeted animal health surveillance. The program supports market access, traceability, emergency disease preparedness, disease control programs and regulation of chemical use.

The recent merger of several government agencies led to a realignment of functions and my responsibilities as Western Australia's Chief Veterinary Officer now include animal welfare and aquatic health and biosecurity. Both of these areas are critical to the sustainability of their respective industries, and the merging brings many opportunities.

There is a strong focus on partnering with stakeholders (industry and government) to ensure the biosecurity and animal welfare status of our animals. In 2019, workshops with our pig and poultry sectors focused on emergency disease preparedness. The Western Australian pig industry workshopped African swine fever (ASF) and the response arrangements should it be detected in Australia. ASF has also been a national priority, with the Animal Health Committee forming a taskforce to enhance Australia's biosecurity and preparedness arrangements. The willingness for industry and government to work together on biosecurity is a real strength that underpins Australia's biosecurity framework.

This issue of *Animal Health Surveillance Quarterly* focuses on surveillance activities, including those for enzootic bovine leucosis (EBL) in the Australian dairy herd. The ABW Program recently partnered with the Western Australian dairy industry to undertake targeted surveillance for EBL to underpin the state's export market certification. The state industry funds extra EBL surveillance and testing to support disease freedom claims.

Western Australia has developed a Biosecurity Intelligence Platform, which collates biosecurity data from multiple sources. This exciting information management initiative supports early identification of biosecurity risks, enhances response and enables the collation of data to support disease freedom claims and property-of-origin certification.

In closing, the maintenance of Western Australia's cattle Johne's disease status remains a focus of the Western Australian cattle industry. The Cattle Industry Management Committee has funded a risk-based, active surveillance program to support Western Australia's Johne's disease status claims in cattle. The surveillance and testing have been concluded, and the final analysis will be presented to the committee at its next meeting.

Dr Michelle Rodan,
Chief Veterinary Officer, Western Australia

Enzootic bovine leucosis

Louise Sundermann
Dairy Australia

Enzootic bovine leucosis (EBL) is a disease of cattle, sheep and buffaloes caused by an oncovirus in the bovine leukaemia virus family. It is a notifiable disease in all states and territories of Australia. Clinical disease is very rare in Australia, spreads slowly and is easily controlled through culling.

Control of EBL in our national dairy herd was initiated in the 1990s and eradication was achieved by 2012.

Dairy Australia, as the national post-freedom coordinating body, is responsible for ongoing targeted surveillance to maintain EBL freedom status. This has involved bulk milk ELISA testing of the whole Australian dairy herd on a 3-year sampling schedule cycle. The annual surveys provide a 99% confidence of detecting a 0.2% prevalence of infection.

All herds have tested EBL negative over the most recent periods:

- 1685 herds in 2015–16
- 2220 herds in 2016–17
- 1747 herds in 2017–18
- 1467 herds in 2018–19.

As there is no routine surveillance program for EBL in the Australian beef industry, biosecurity provisions are incorporated in dairy on-farm quality assurance programs and in extension advice to dairy farmers to test any non-dairy cattle introductions for EBL. Herds with serological or other evidence of EBL must be promptly notified to the relevant state or territory chief veterinary officer. Eradication requirements would have to be met before the herd could again be considered free from EBL.

In 2019, the long-standing status of the Australian dairy herd remains unchanged; no infected herds have been detected.

Bonamiosis in farmed native oysters (*Ostrea angasi*)

Dr Tracey Bradley
Agriculture Victoria

Native oysters (*Ostrea angasi*) have been an important food source for the Indigenous peoples in Australia for millennia. Since colonisation, extensive harvesting of the wild populations has depleted supplies in bays and inlets around Victoria, South Australia and other parts of the country. There have been several attempts to farm native oysters in Port Phillip Bay, Victoria, and other locations. Farming attempts in Victoria were devastated in 1991 by a parasite belonging to the genus *Bonamia*, which resulted in the closure of native oyster farms. *Bonamia exitiosa* was later identified in Georges Bay, Tasmania (1992), and in Albany, Western Australia (1993).

Despite the early setback to farming, interest in native oyster culture remained strong in south-east Australia in response to the prospect of good domestic and international markets.

Native oysters are also valued as a supplemental crop to farmers of the Pacific oyster (*Crassostrea gigas*). Cultivating both species provides a safeguard against the effects of ostreid herpesvirus type 1 (OsHV-1) microvariant, which has caused production losses in Australian Pacific oyster culture since 2010.

Small-scale farming of native oysters recommenced in 2011, along with an annual monitoring program for the presence of *Bonamia* sp. Detection of the pathogen relied on quantitative polymerase chain reaction (qPCR) testing and histopathological examination. Infection in

Figure 1 Author inspecting native oysters in Victoria

apparently healthy oysters was detected a few years later and increased in prevalence over time, culminating in a clinical outbreak of bonamiosis on one site with associated high mortalities. DNA sequencing determined that this outbreak was due to *B. exitiosa*.

Apparent subclinical infection was detected by qPCR surveillance in wild native oysters in Port Phillip Bay and on some farm sites. However, this infection did not progress to clinical expression. Given the similar origin of source stock and the history of bonamiosis in Victorian waters, the question of why some farm sites progress to clinical disease where others remain healthy became of interest.

Figure 2 Basket culture of native oysters in Victoria

The Fisheries Research and Development Corporation funded a 3-year collaborative project, headed by Agriculture Victoria, to develop a deeper understanding of the infection dynamics, diagnostics, epidemiology, and management of *B. exitiosa* in native oyster populations in south-eastern Australia. From this collaboration, a series of trials were designed to investigate proposed risk factors for the development of clinical bonamiosis under normal farming or controlled laboratory conditions.

In Victoria, four individual tank and field trials were undertaken between 2016 and 2018. The tank trials subjected both presumed subclinically infected oysters and healthy oysters to stressors, such as heat, starvation and turbulence. Further tank trials examined oyster origin and size as risk factors. For these trials, the end point for assessment was 'oyster death'.

In the first tank trial, the risk factors, starvation alone, and combinations of starvation, hot water and tumbling, yielded significantly higher mortality rates than the control group. In the second tank trial, the risk factors of oyster size and origin were studied under normal and 'stressed' conditions (heated water and starvation). Oysters were selected from a clinically infected farm and a farm with a known prevalence of infection but no clinical disease. The case fatality rate and the likelihood of death were found to be higher in the farm-sourced oysters that had not experienced previous clinical disease. Survival analysis similarly confirmed that *B. exitiosa* infected oysters from the non-clinical farm died at a much higher rate than those from

the clinically infected farm. This suggested either genetic differences conferring a benefit or some form of resistance developing across the two farms.

The field trials used existing farm sites and practices to investigate some proposed risk factors of interest to the farmers. The field trials were conducted on a known clinically infected farm and examined presumed risk factors of basket density, basket depth in the water column, oyster size and level of fouling. Concurrently, the project validated the diagnostic performance of the *B. exitiosa* test. qPCR testing established the optimal epidemiological qPCR cycle threshold (CT) value to differentiate between a positive and negative result.

The first field trial found the only significant risk factor was the size of the oyster; smaller oysters had a 10% higher mortality rate than larger oysters. In the second field trial, the risk factors investigated were cage density and level of fouling, but this trial did not yield any significant findings. In both trials, the mortality rates were over 30%.

It appears that native oysters are endemically infected with the parasite *B. exitiosa* on farms and in the wild in Port Phillip Bay, Victoria. In response to this finding, a biosecurity manual has been created to help native oyster farmers reduce the risk of transferring this parasite and other diseases between sites. Modifying husbandry methods to reduce stressors may well result in reduced mortalities arising from the clinical presentation of this disease.

FRDC will soon publish a full report on the findings of all collaborators in this project (no. 2015-001).

Figure 3 Native oysters (*Ostrea angasi*)

Wildlife Health Australia

Keren Cox-Witton, Silvia Ban and Tiggy Grillo
Wildlife Health Australia

Wildlife Health Australia (WHA)[1] is the peak body for wildlife health in Australia. WHA was established as the Australian Wildlife Health Network in 2002 as an Australian Government initiative to coordinate wildlife health surveillance information across Australia, to support Australia's animal health industries, human health, biodiversity, trade and tourism. WHA collates information from multiple sources into a national database — the Wildlife Health Information System (eWHIS)[2] — including submissions by WHA subscribers, state and territory WHA coordinators, researchers, and university, zoo and sentinel clinic veterinarians.

During the quarter, 173 wildlife disease investigation events were reported in eWHIS (Table 1 and Figure 4), and samples were collected from 1212 wild birds for avian influenza (AI) surveillance.

This report details some of the disease and mortality events in free-living wildlife recorded in

Table 1 Number of disease investigations reported into eWHIS, April to June 2019[a]

Mammals				Birds[d,e]	Reptiles[f]
Bats[b]	Marsupials	Marine mammals	Feral mammals[c]		
106	26	1	4	34	2

a Disease investigations may involve a single animal or multiple animals (e.g. mass mortality event).
b The majority of bat disease investigations are single bats submitted for Australian bat lyssavirus testing.
c European rabbits (Oryctolagus cuniculus) and sambar deer (Cervus unicolor).
d Additional sampling for targeted AI surveillance is presented elsewhere in this report.
e Includes free-ranging birds (native or feral species) and a small number of events involving birds from zoological collections and captive breeding programs
f One event involved captive snakes and the other a non-native reptile found in the wild.

1 www.wildlifehealthaustralia.com.au/Home.aspx
2 www.wildlifehealthaustralia.com.au/ProgramsProjects/eWHISWildlifeHealthInformationSystem.aspx

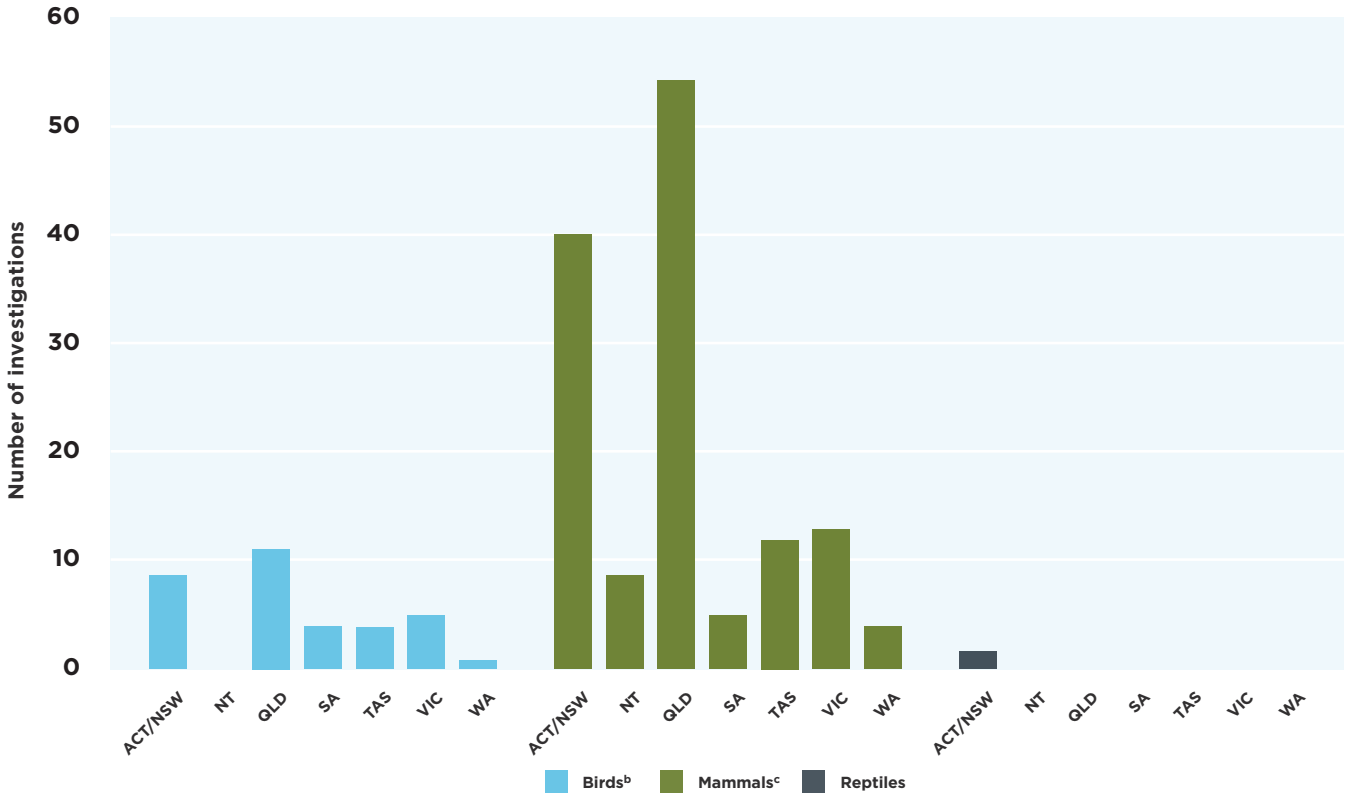


Figure 4 Number of disease investigations reported, by jurisdiction, in eWHIS, April to June 2019[a]

a The chart shows the number of disease investigation events reported in eWHIS. Each investigation may involve one or multiple animals.
b 'Birds' includes free-ranging birds (native or feral species) and a small number of events involving birds from zoological collections and captive breeding programs.
c Investigations involving mammals include individual bats submitted for Australian bat lyssavirus testing.
d One event involved captive snakes and the other a non-native reptile found in the wild.

eWHIS this quarter. WHA thanks all those who submitted information for this report.

Wild bird mortality event summary — Newcastle disease and avian influenza exclusion

WHA received 34 reports of wild bird mortality or morbidity investigations from around Australia during the quarter; investigations may involve a single animal or multiple animals (e.g. mass mortality event). A breakdown of wild bird events by taxonomic order is given in Table 2. Reports and samples from sick and dead birds are received from members of the public, private practitioners, universities, zoo wildlife clinics and wildlife sanctuaries. AI was excluded by polymerase chain reaction (PCR) testing for influenza A in 13 events as part of Australia's general (sick and dead bird) AI surveillance program. Disease caused by AI was excluded in the remaining 21 events, based on clinical signs, history, histopathology, prevailing environmental conditions or other diagnoses. Avian paramyxovirus (APMV) was excluded in 10 events by PCR testing for Newcastle disease (ND) virus or pigeon paramyxovirus type 1 (PPMV-1), or both.

PPMV-1 was diagnosed in free-living rock pigeons (*Columba livia*) that were reported sick and dying in an inner northern suburb of Melbourne in April 2019. Four sick birds with neurological signs, including torticollis, were submitted to AgriBio Veterinary Diagnostic Services, Bundoora, for examination. All four birds had racing bands on a lower leg, indicating they had been domestic pigeons previously. Pooled choanal and cloacal swabs from three birds tested positive for PPMV-1 by real-time PCR assay. Histopathological findings of mild-to-moderate nephritis in all three pigeons were consistent with PPMV-1 infection.

Findings in wild bird disease investigations this quarter also included aspergillosis, avian pox, botulism, *Escherichia coli* infection, *Macrorhabdus ornithogaster* infection, parasitism, poisoning, protozoal infection, trichomoniasis and trauma.

Avian influenza surveillance

Australia's National Avian Influenza Wild Bird Surveillance Program[3] comprises two sampling components: pathogen-specific, risk-based surveillance by sampling of apparently healthy, live and hunter-shot wild birds; and general surveillance by investigating significant unexplained morbidity and mortality events in wild birds, including captive and wild birds

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

Table 2 Wild bird disease investigations, by taxonomic order, reported into eWHIS, April to June 2019

Bird order	Common name for bird order[a]	Events reported[b]
Accipitriiformes	Osprey, hawks and eagles	1
Anseriformes	Magpie geese, ducks, geese and swans	1
Charadriiformes	Shorebirds	2
Columbiformes	Doves and pigeons	1
Coraciformes	Bee-eaters and kingfishers	1
Falconiformes	Falcons	1
Passeriformes	Passerines or perching birds	9
Pelecaniformes	Ibis, herons and pelicans	1
Phaethontiformes	Tropicbirds	1
Procellariiformes	Fulmars, petrels, prions and shearwaters	3
Psittaciformes	Parrots and cockatoos	10
Sphenisciformes	Penguins	3
Strigiformes	Typical owls and barn owls	1

a Common names adapted from: del Hoyo and Collar, 2014, *HBW and BirdLife International Illustrated Checklist of the Birds of the World*. Volume 1 — Non-passerines, Lynx Editions, Barcelona. (Courtesy of the Australian Government Department of the Environment and Energy.)

b Disease investigations may involve a single or multiple bird orders (e.g. mass mortality event). The number of events reported against each bird order does not equal the total number of investigations due to multi-species events. This quarter, one wild bird event involved the orders Coraciformes and Passeriformes.

within zoo grounds (with a focus on exclusion testing for AI virus subtypes H5 and H7).

Samples from sick or dead birds were discussed earlier. Sources for targeted wild bird surveillance data include state and territory government laboratories, universities and samples collected through the Northern Australia Quarantine Strategy.

During the quarter, pathogen-specific, risk-based surveillance occurred at sites in New South Wales, the Northern Territory, Queensland, Tasmania, Victoria and Western Australia. Of the 1212 cloacal, oropharyngeal and faecal environmental swabs collected from waterbirds, 1213 were tested for AI viruses (AIVs). Based on results to date, no highly pathogenic AIVs were identified. However, targeted surveillance activities this quarter continued to find evidence of low pathogenicity avian influenza (LPAI) viruses, including LPAI H5 and H7.

Molecular analysis of AIVs detected through the targeted surveillance activities:[4,5]

- contribute to the understanding of AIV dynamics in Australia
- help maintain the currency of diagnostic tests
- serve as a point of comparison when novel AIV strains of importance emerge overseas.

The findings reiterate the need for poultry producers to remain alert and ensure that appropriate biosecurity arrangements and effective risk reduction measures for AI are in place at their premises.

Australian bat lyssavirus

Reports to WHA for the 6 months from January to June 2019 included 340 bats tested for Australian bat lyssavirus (ABLV) from all states and territories.

Bat submissions were made for a variety of reasons:

- 83 cases involved contact with the potential for ABLV transmission to humans; of these
  - 39 were also associated with trauma (e.g. barbed wire fence and fruit tree netting entanglement, bone fractures, wing tears)
  - 10 also involved contact with a pet dog or cat
  - 7 displayed neurological signs (e.g. hindlimb paralysis, head tremors, unusual vocalisations, seizures)
  - 8 displayed other (non-neurological) signs
  - the remainder had no further history reported
- 137 cases involved contact with a pet dog (115) or cat (18), or both (4)
- 47 cases were associated with trauma (e.g. injuries due to entanglement in barbed wire fence or fruit tree netting, electrocution on power lines, fractures)

4 Haynes et al. 2009, Australian surveillance for avian influenza viruses in wild birds (July 2005 to June 2007). *Australian Veterinary Journal* 87(7): 266–272.

5 Grillo et al. 2015, Avian influenza in Australia: a summary of 5 years of wild bird surveillance. *Australian Veterinary Journal* 93(11): 387–393.

- 14 bats displayed neurological signs (e.g. aggression, disorientation, self-mutilation, unusual vocalisation, inability to swallow, head tremors, head tilt, nystagmus, twitching, seizures, paralysis)
- 28 bats displayed other (non-neurological) signs
- 5 bats were found dead
- 26 bats had no history reported, including 22 from a Queensland surveillance project.

Bat carers submitted 76 insectivorous bats as part of an ongoing surveillance project conducted by the Queensland Department of Agriculture and Fisheries, and all tested negative for ABLV.

In the first half of the year, six flying-foxes were confirmed positive for ABLV by fluorescent antibody test, PCR testing for pteropid ABLV ribonucleic acid (RNA) and/or immunohistochemistry. These were two grey-headed flying-foxes (*Pteropus poliocephalus*), two little red flying-foxes (*P. scapulatus*) and two unidentified flying-foxes (*Pteropus* sp.), all from New South Wales. Details of the cases are as follows:

- In two cases, the flying-foxes presented with neurological signs. One was rescued after falling from a tree; it displayed lethargy, head tremor, salivation, inappetence and respiratory distress. The other was found in a backyard; it was depressed and showed unilateral hindlimb paralysis and involuntary movements.
- Two flying-foxes were submitted for testing due to potentially infectious contact with a human. One had unusual vocalisation but no other overt neurological signs.
- A grey-headed flying-fox was euthanased after being injured by a dog and subsequently developing an ascending paralysis.
- A little red flying-fox was part of a colony affected by a heatwave and was found hanging in a tree close to the ground, distressed and unable to fly.

Potentially infectious human contact was reported for four of the six cases. In each event, clinical advice was provided by an experienced public health official.

More information on ABLV testing of bats in Australia is available in ABLV Bat Stats.[6] ABLV is a nationally notifiable disease in Australia. Cases of suspect ABLV infection or exposure should be reported to the Emergency Animal Disease Watch Hotline on 1800 675 888.

6 www.wildlifehealthaustralia.com.au/ProgramsProjects/BatHealthFocusGroup.aspx

State and territory reports

Summary

During the quarter, 2055 livestock disease investigations[7] were conducted to rule out emergency diseases or investigate suspect notifiable diseases.[8] The number of investigations in each state and territory by animal category is shown in Figure 5. Field investigations were conducted by government veterinary or biosecurity officers and private veterinary practitioners. The number of investigations in each state and territory by veterinary investigator category is shown in Figure 6.

Across Australia, 1997 livestock sample submissions[9] were processed during the quarter to investigate suspect notifiable diseases or rule out emergency animal diseases (EADs). The number of livestock sample submissions by state and territory is shown in Figure 7. Sample submissions were also processed to substantiate proof of disease freedom certifications and for accreditation programs and targeted surveillance. Data currently available on the National Animal Health Information System (NAHIS) include:

- serological testing for equine infectious anaemia (EIA) and equine viral arteritis (EVA), including for export certification.
- bovine brucellosis testing of cattle for export and other (non-abortion investigation) reasons.
- transmissible spongiform encephalopathies (TSE) testing.

Three reports from livestock disease investigations are included to highlight ongoing surveillance, diagnostic capacity and response activities. These reports do not represent the full range of livestock disease incidents during the quarter.

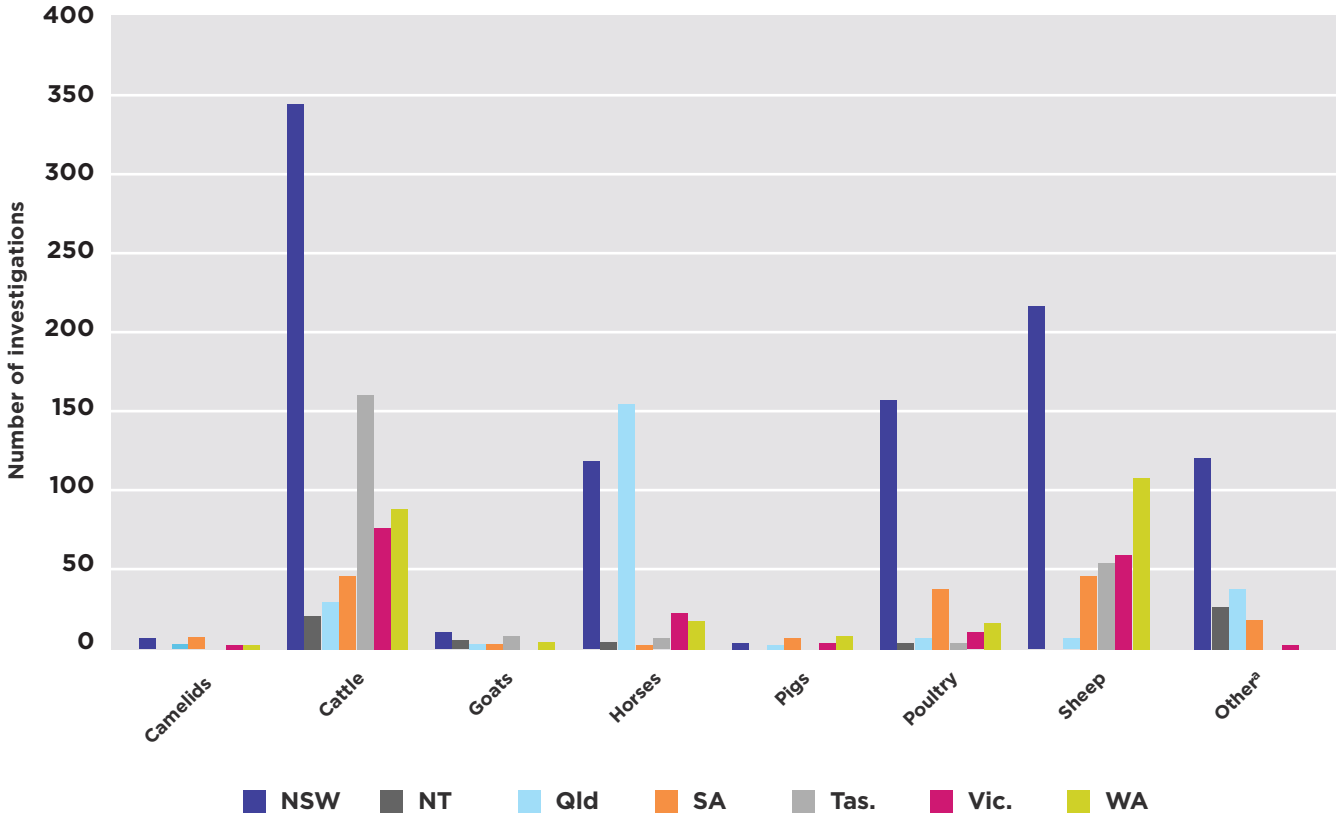


Figure 5 Number of field disease investigations to investigate suspect notifiable diseases[b] or rule out emergency animal diseases in each jurisdiction by animal category, 1 April to 30 June 2019.

a includes aquatic animals, aviary birds, bees and dogs

b Field investigation for a state or territory notifiable disease with laboratory diagnostic testing

7 Field investigation with laboratory diagnostic testing.

8 Emergency diseases are a subset of notifiable disease defined as diseases listed in the Emergency Animal Disease Response Agreement www.animalhealthaustralia.com.au/what-we-do/emergency-animal-disease/ead-response-agreement

9 Some investigations involved multiple submissions.

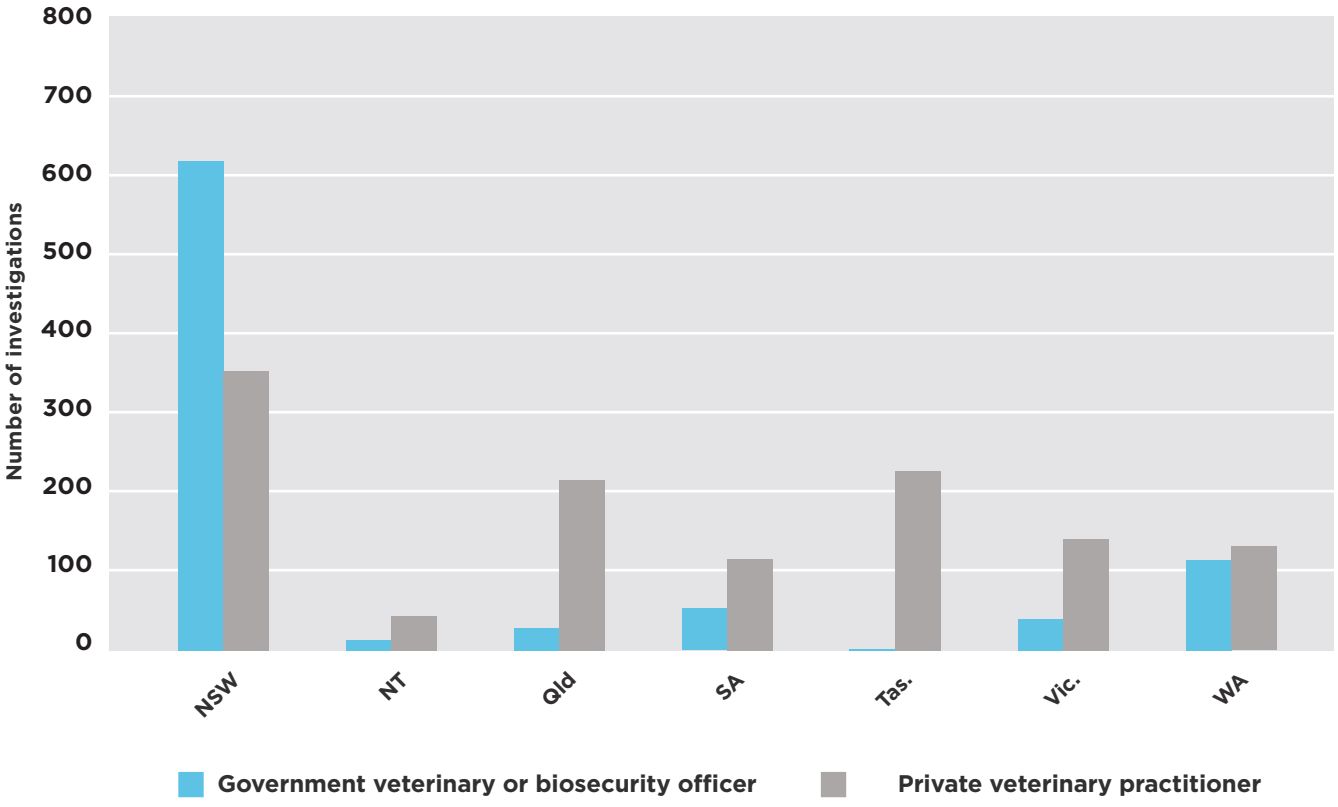


Figure 6 Number of field investigations in each jurisdiction conducted by private veterinarians and government officers, 1 April to 30 June 2019.

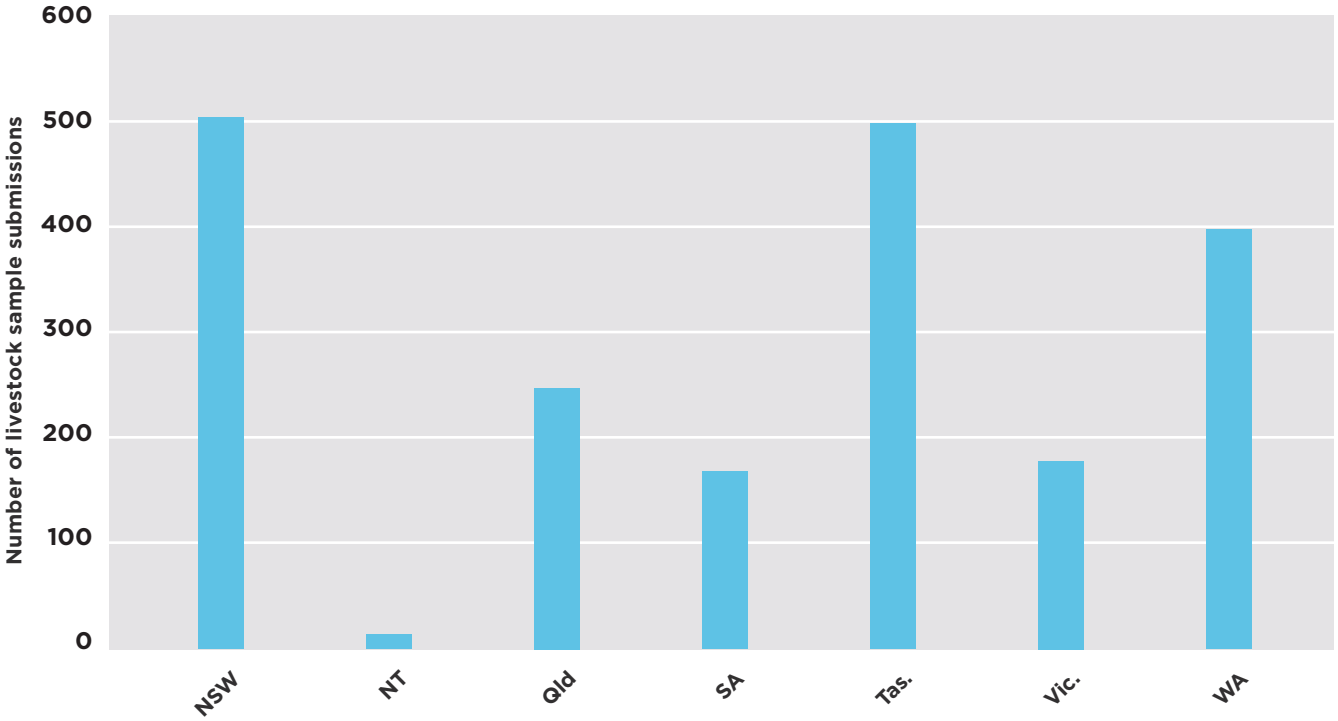


Figure 7 Number of livestock sample submissions processed in each jurisdiction to investigate suspect notifiable diseases or rule out emergency animal diseases, 1 April to 30 June 2019.

Salmonella Enteritidis update

Jenna Fraser
NSW Department of Primary Industries

The New South Wales egg and poultry industries are engaged to stop the spread of Salmonella enterica serovar Enteritidis (SE) and manage its impacts after the bacteria was detected in New South Wales for the first time in September 2018.

The SE detection followed confirmation of 23 human cases of SE gastroenteritis in the Sydney area. Investigations by the NSW Food Authority found that several people who had been reported ill had consumed eggs from one commercial layer farm in South West Sydney.

Since the initial detection, NSW Department of Primary Industries (DPI), NSW Food Authority, NSW Health and Local Land Services (LLS) have increased monitoring and surveillance to limit the impact of SE on producers and consumers. As a result, 13 infected properties have been identified since SE was first discovered in the state. All these properties are interconnected in some way, such as the movement of people, eggs or equipment.

The approach taken by NSW DPI to manage the 13 infected properties has remained consistent with the principles outlined in the industry SE response plan published by Australian Eggs Pty Limited. Infected properties have been issued with biosecurity

Figure 8 Map of premises infected with SE. Tableau

Figure 9 Layer hens housed in a barn system with automatic feeders and drinkers. Since September 2018, SE has been detected on commercial farms that house chickens in a cage, barn and free-range facilities. Image by J Fraser.

directions to prevent movement of birds, eggs, manure, soil and materials. Depopulation of birds and disposal and decontamination programs have been implemented. Surveillance at the 13 properties is ongoing.

The investigations have reinforced the ongoing need to continually review biosecurity measures to ensure best-practice arrangements are in place for the safety of consumers and industry. That is why NSW DPI continues to work with industry and affected producers to lift biosecurity standards and ensure a sustainable egg industry.

SE is the most common serotype of Salmonella isolated from human cases of foodborne gastroenteritis around the world. In chickens younger than 2 weeks of age, infection with SE can result in symptoms of gastroenteritis, including poor growth, weakness, diarrhoea and dehydration. In contrast, adult hens that become colonised with SE typically remain asymptomatic with intermittent faecal shedding. This form of Salmonella can colonise the avian reproductive tract and contaminate the internal contents of eggs.

Figure 10 Since September 2018, some egg recalls have been associated with detections of SE in New South Wales. Image by J Fraser.

Resources developed since September 2018 are available to help producers protect their poultry farms from SE. Current information about SE in New South Wales is available at www.dpi.nsw.gov.au/SE.

For details, call Jenna Fraser, Veterinary Policy & Project Officer, NSW DPI Animal Biosecurity, Paterson NSW on 02 4939 8940.

Figure 11 Staff from the Greater Sydney LLS region and the NSW DPI Animal Biosecurity unit collected whole blood and cloacal swab samples from layer chickens on the first infected property in September 2018. Image by J Fraser.

Polioencephalomalacia in weaner cattle near Katherine

Megan Pickering
Department of Primary Industry and Resources, Northern Territory

Government officers investigated an incident of polioencephalomalacia (PEM) at a station near Katherine, Northern Territory.

On 12 May 2019, 800 home-bred cattle aged 6 to 18 months were mustered for weaning. The paddock of origin contained minimal feed, but the cows and weaners were in good body condition and mustered to the yards without any extraordinary issues.

At the yards on the first day, the animals had neither chemical treatments, husbandry procedures nor access to any feed supplements. The weaners were separated from the cows into yards and had access to freshly cut Rhodes grass (*Chloris gayana*) hay and water.

The next day, one weaner was found dead in the yard; the remaining animals appeared healthy. On 14 May, another weaner was found dead; three were observed as staggering and drooling. On 15 May, the station manager contacted the regional stock inspector. Another six animals showed similar signs, including two that were moribund with seizure activity and two that died overnight. Affected animals were among the heavier weaners in the group.

Regional Livestock Biosecurity staff attended the property later the same day. By then, another 11 animals had developed significant neurological clinical signs, including head pressing, drooling, jaw champing, staggering, odd vocalisation and altered mentation (Figure 12 and Figure 13). Two moribund animals were euthanased for necropsies.

Visible signs of organ malfunction at necropsy were negligible. Animal 1 had no grossly visible abnormality. Animal 2 was found to have some firm, red, encapsulated nodules in one lung lobe, considered incidental to the neurological signs.

Samples were submitted to Berrimah Veterinary Laboratory, Darwin, on 16 May. Differential diagnoses for the neurological

Figure 12 Affected weaners were observed in the yards head pressing in a corner and hypersalivation.

disease included PEM, bovine herpesvirus type 5 (BHV-5), urea toxicity, lead poisoning, vitamin A deficiency, rabies, Australian bat lyssavirus (ABLV) and Aujeszky's disease.

Samples from Animal 2's lung lesion were submitted to rule out exotic disease, including bovine tuberculosis, contagious bovine pleuropneumonia and haemorrhagic septicaemia.

The lung lesions in Animal 2 were consistent with acute aspiration. A normal oral cavity commensal bacterium, *Granulicatella adiacens*, was cultured, suggesting inhalation of oral bacteria in the days before its death.

Toxicology testing on the aqueous humor ruled out urea poisoning. Blood lead testing was not done, but there was no history of access to a lead source and blood film examination did not show any markers for altered cell morphology or anaemia. Contagious, non-exotic causes of neurological disease, such as infection with *Histophilus somni* or BHV-5, was ruled out on histological findings. Histopathology results showed no changes to white matter in either brain (animals 1 or 2), and mild-to-moderate degeneration and oedema of cerebral grey matter in both. These were consistent with either urea toxicity (ruled out) or PEM. There were no histological changes to the lumbar spinal cord in either animal.

Figure 13 Affected weaners were observed in the yards staggering and struggling to rise.

Testing undertaken at CSIRO Australian Animal Health Laboratory to rule out exotic diseases for the neurological and respiratory lesions, as shown in Table 3. The clinical findings, disease course and laboratory results point to a conclusion of PEM as the cause of this morbidity and mortality event.

PEM is an acute nutritional disease of young growing animals in good body condition. In Australia, most cases are associated with a functional deficiency of vitamin B_1 (thiamine). In this case, the change in feed from relatively scarce, low-quality dry pasture to unlimited, good quality hay caused a sudden change in the microflora of the rumen. The consequential drop in thiamine production led to PEM.

A presumptive diagnosis was made within 24 hours of investigation. The remaining weaners were removed from the hay temporarily and then provided access to reduced quantities over the next few days. By 17 May, no further cases had occurred, and mildly affected animals were returning to normal. In total, 15 animals died or were humanely destroyed; morbidity was approximately 3% and mortality < 2%. Cases have been reported of losses up to 10%.

Table 3 Exotic and emergency animal disease exclusion testing performed 2019[a]

Agent	Test	Result
Lyssavirus antigen	Fluorescent antibody test of brain tissue	Antigen not detected (animals 1, 2)
Australian bat lyssavirus	Pteropid RT–TaqMan assay of brain tissue	Negative (animals 1, 2)
	Insectivorous RT–TaqMan assay of brain tissue	Negative (animals 1, 2)
Aujeszky's disease virus	TaqMan assay of brain tissue	Negative (animals 1, 2)
***Pasteurella multocida* haemhorrhagic septicaemia**	PCR assay	Negative (Animal 2)
Lyssavirus	RT-PCR assay	Negative (animals 1, 2)
Pasteurella multocida	PCR assay	Negative (Animal 2)
***Mycoplasma mycoides* cluster**	PCR assay	Negative (Animal 2)
General bacterial isolation	Culture of lung tissue	Mycoplasma not detected (Animal 2)

a Only animal 2 had lung lesions; no testing was undertaken for respiratory pathogens in animal 1.

Foot-and-mouth disease exclusion in beef cattle

Jane Owens
Department of Primary Industries and Regions, South Australia (PIRSA)

Two 12-month-old Angus beef heifers from a property near Nairne in the Adelaide Hills presented with lameness and profuse salivation (Figure 14). Erosions were observed on the oral mucosa (Figure 15). One heifer was moribund and euthanased for a necropsy. Samples were sent to Gribbles Veterinary Pathology and the CSIRO Australian Animal Health Laboratory.

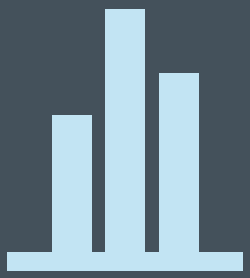
On histopathology, perivascular lymphocytic infiltrates and vasculitis were observed in multiple organs. This was consistent with malignant catarrhal fever (MCF). The diagnosis of MCF caused by ovine herpesvirus type 2 (OHV-2) was confirmed by PCR assay of splenic tissue at the Department of Primary Industries and Regional Development Diagnostic Laboratory Services, Perth. The clinical signs were also consistent with vesicular diseases. Antibody and antigen ELISAs, PCR assay and virus isolation performed on tissue samples and swabs from the oral mucosa were negative for foot-and-mouth disease. PCR assay, antibody serum neutralisation and virus isolation for vesicular stomatitis were also negative. All tests for exotic disease exclusion were performed at CSIRO Australian Animal Health Laboratory. PCR assay for bovine viral diarrhoea virus types 1 and 2 (BVDV-1 and BVDV-2)[10] on serum tested negative at Gribbles VetLab, the state veterinary diagnostic laboratory.

Figure 14 Affected heifer showing profuse salivation.

Figure 15 Erosions on the oral mucosa of an affected heifer.

Sheep-associated bovine MCF is a systemic viral disease caused by ovine gammaherpesvirus type 2 (OHV-2), primarily affecting cattle, deer and buffaloes. It causes an acute disease characterised by lymphoid proliferation, vasculitis and erosive ulcerative mucosal and skin lesions. It mainly affects the respiratory and gastrointestinal systems and is often fatal. Transmission is only from sheep to susceptible hosts, not horizontally between infected hosts. The only effective control strategy is to separate the carriers from other susceptible species.

10 The severe BVDV-2 form found in Europe and North America has not been identified in Australia.



Quarterly Statistics

Endemic disease monitoring
Laboratory testing
Surveillance activities

Endemic disease monitoring

Johne's disease

In Australia, Johne's disease occurs primarily in dairy cattle and sheep and to a lesser extent in beef cattle, camelids, deer and goats. Infection in sheep occurs to varying extents across the sheep-producing regions of southern Australia. Investigations for Johne's disease in alpacas, cattle, deer, goats and sheep are reported in Table 17.

Approaches based on risk assessment and management have been developed to control Johne's disease in all affected species. Market assurance programs (MAPs) are in operation for alpacas, goats and sheep; the numbers of herds or flocks that have reached a status of Monitored Negative 1 or higher are shown in Table 4. For status definition, see the current MAP manual.[11] Lists of alpaca and goat herds and sheep flocks assessed in the MAPs are available on the Endemic Disease Information System website.[12] Herd or flock testing is undertaken by a MAP-approved veterinarian. The MAP for cattle ceased on 1 November 2016, with herds moving to industry-specific (beef or dairy) assurance scores. These risk profiling tools have different levels of biosecurity and testing, with higher levels requiring veterinary supervision. Information about components of the National Johne's Disease Project can be obtained from state coordinators and Animal Health Australia's Johne's disease coordinator.

Table 4 Herds or flocks[a] with a Market Assurance Program status of at least Monitored Negative 1, 1 October 2018 to 30 June 2019

Quarter	Alpacas	Goats	Sheep	Total
Oct–Dec 2018	7	23	364	394
Jan–Mar 2019	7	22	356	385
Apr–Jun 2019				
NSW	1	5	144	150
Qld	0	8	1	9
SA	7	10	146	163
Tas.	0	1	11	12
Vic.	0	0	53	53
WA	0	0	4	4
Aus.	**8**	**24**	**359**	**391**

a There are no herds or flocks in Northern Territory in the MAPs.

Ovine brucellosis

Brucella ovis is present in commercial sheep flocks at a low level that varies around the country. Voluntary accreditation programs (usually in stud flocks) for ovine brucellosis freedom operate in all states. Table 5 shows the number of accredited flocks at the end of the quarter.

Table 5 Ovine brucellosis accredited-free flocks, 1 April 2018 to 30 June 2019

State	Apr–Jun 2018	Jul–Sep 2018	Oct–Dec 2018	Jan–Mar 2019	Apr–Jun 2019
NSW	836	844	837	837	834
Qld	73	75	77	80	82
SA	497	490	491	491	488
Tas.	56	60	62	61	65
Vic.	419	419	413	423	438
WA	193	193	197	203	208
Aus.	**2,074**	**2,081**	**2,077**	**2,095**	**2,115**

11 www.animalhealthaustralia.com.au/what-we-do/endemic-disease/maps/

12 edis.animalhealthaustralia.com.au/public.php?page=mapsearch&aha_program=3

Laboratory testing

Serological testing

Table 6 summarises the results of serological testing for two equine viruses on samples submitted to state and territory animal health laboratories during the quarter, including many submissions for export certification.

Table 6 Results of serological testing for two equine viruses, 1 April 2018 to 30 June 2019

Quarter	No. of tests (equine infectious anaemia)	Positive (equine infectious anaemia)	No. of tests (equine viral arteritis)	Positive (equine viral arteritis)
Apr–Jun 2018	694	0	707	5
Jul–Sep 2018	455	1	373	1
Oct–Dec 2018	1,431	0	741	15
Jan–Mar 2019	370	0	300	2
Apr–Jun 2019				
NSW	392	0	359	5
NT	0	0	0	0
Qld	252	0	149	2
SA	0	0	0	0
Tas.	0	0	0	0
Vic.	255	0	247	22
WA	9	0	4	0
Aus.	**908**	**0**	**759**	**29**

Table 7 summarises the results of laboratory testing for equine herpesvirus type 1 on samples submitted to state and territory animal health laboratories during the quarter.

Table 7 Results of testing for equine herpesvirus type 1 (EHV-1), 1 April to 30 June 2019

Syndrome	EHV-1 suspected but not confirmed	Negative	Positive	Total
Abortion	0	80	4	84
Neurological	0	26	0	26
Other	0	6	0	6
Total	**0**	**112**	**4**	**116**

Table 8 summarises the results of serological testing for three arboviruses on samples submitted to state and territory animal health laboratories for the National Arbovirus Monitoring Program (NAMP).[13] Positive serological test results are not an indication of the presence of clinical disease.

Table 8 Results of serological testing for three arboviruses, 1 April 2018 to 30 June 2019

Quarter	No. of tests (Akabane)	Positive (Akabane)	No. of tests (BEF)	Positive (BEF)	No. of tests (BTV)	Positive (BTV)
Apr–Jun 2018	710	59	1,068	77	1,819	92
Jul–Sep 2018	430	38	737	49	1,016	28
Oct–Dec 2018	327	38	632	51	927	34
Jan–Mar 2019	343	56	709	37	1,059	86
Apr–Jun 2019	**465**	**37**	**909**	**53**	**1,415**	**100**

BEF = bovine ephemeral fever virus; BTV = bluetongue virus

13 namp.animalhealthaustralia.com.au

Surveillance activities

Bovine brucellosis

Australia declared freedom from bovine brucellosis (caused by *Brucella abortus*) in 1989.[14] Surveillance is maintained through abortion investigations and additional testing of cattle for export or other reasons. Table 9 shows 91 bovine abortion investigations and 564 investigations for other reasons were performed during the quarter; all were negative for bovine brucellosis.

Table 9 Bovine brucellosis testing, 1 April 2018 to 30 June 2019

Quarter	No. of tests (abortion)	Positive (abortion)	No. of tests (other reasons)[a]	Positive (other reasons)
Apr–Jun 2018	194	0	1,106	0
Jul–Sep 2018	130	0	103	0
Oct–Dec 2018	113	0	769	0
Jan–Mar 2019	48	0	1,203	0
Apr–Jun 2019				
NSW	9	0	392	0
NT	0	0	0	0
Qld	0	0	110	0
SA	0	0	10	0
Tas.	4	0	0	0
Vic.	34	0	36	0
WA	44	0	16	0
Aus.	**91**	**0**	**564**	**0**

a Some of this test data comes from pre-export testing of cattle destined for live export markets where the importing country requires testing. The total number of tests each quarter might vary depending on total cattle exports to particular markets.

14 www.agriculture.gov.au/SiteCollectionDocuments/animal-plant/animal-health/pet-food-safety/brucella-abortus-colour.doc

National Transmissible Spongiform Encephalopathies Surveillance Program

The National Transmissible Spongiform Encephalopathies Surveillance Program (NTSESP) is an integrated national program jointly funded by industry and government to demonstrate Australia's ongoing freedom from bovine spongiform encephalopathy (BSE) and classical scrapie, and to provide early detection of these diseases should they occur. The program, based on the World Organisation for Animal Health (OIE) *Terrestrial Animal Health Code,*[15] involves testing of samples from cattle and sheep with clinical signs consistent with BSE or classical scrapie, respectively. Opportunistic sampling of fallen and casualty slaughter cattle and sheep is also undertaken. Cattle samples are 'scored' according to the animal's age and subpopulation category (i.e. the likelihood of detecting BSE). Australia's target is to achieve a minimum of 150,000 points over a rolling 7-year period. Table 10 shows the number of animals sampled for BSE and classical scrapie and the points tally for cattle in the NTSESP[16] during the past 12 months. All samples tested were negative.

Table 10 Samples tested for transmissible spongiform encephalopathies (TSEs), 1 July 2018 to 30 June 2019

State	No. examined (cattle)	Points (cattle)	Positive (cattle)	No. examined (sheep)	Positive (sheep)
NSW	177	56,932.8	0	128	0
NT	18	7060.8	0	0	0
Qld	141	50,894.5	0	29	0
SA	38	10,804.8	0	41	0
Tas.	17	1937.1	0	9	0
Vic.	140	44.129.1	0	137	0
WA	27	13,910.4	0	172	0
Aus.	**558**	**185,669.5**	**0**	**516**	**0**

Avian influenza

Australia is currently free from highly pathogenic avian influenza (AI). A number of low pathogenic subtypes of AI have been found in wild birds. Please consult the Wildlife Health Australia (WHA) report in this publication for information on AI in wild birds. During the quarter, 515 birds from 95 laboratory submissions were tested for AI (excluding surveillance reported in the WHA and Northern Australia Quarantine Strategy reports); no positive H5 or H7 strains were detected (Table 11). Tests included competitive ELISA (enzyme-linked immunosorbent assay), haemagglutination inhibition, agar gel immunodiffusion (AGID), reverse-transcriptase polymerase chain reaction (PCR) assay and virus isolation.

Table 11 Results of testing for avian influenza virus in domestic birds (poultry, aviary and caged birds), 1 April to 30 June 2019[a]

H5 positive	H7 positive	Positive for a non-H5, non-H7 strain
0	0	0

a Excludes surveillance reported in the Wildlife Health Australia and Northern Australia Quarantine Strategy reports and testing conducted for import purposes.

15 OIE (2018). Bovine spongiform encephalopathy, In: *Terrestrial Animal Health Code*, World Organisation for Animal Health, Paris, www.oie.int/index.php?id=169&L=0&htmfile=chapitre_bse.htm

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

Newcastle disease

Australia is currently free from virulent Newcastle disease or exotic Newcastle disease (caused by avian paramyxovirus serotype 1) even though precursor and endemic avirulent viruses are present in Australia. Vaccination against virulent Newcastle disease using a combination of live lentogenic virus (V4) and a killed vaccine is required in commercial chicken flocks[17] in all Australian jurisdictions. Vaccination exceptions for broilers apply in Queensland, South Australia, Tasmania and Western Australia. During the quarter, 275 birds from 96 laboratory submissions were tested for ND (Table 12). Please consult the WHA report in this publication for information on avian paramyxovirus in wild birds.

Table 12 Results of testing for Newcastle disease (ND) testing in domestic birds (poultry, aviary and caged birds), 1 April to 30 June 2019[a]

Virulent strain of ND virus positive	Peats Ridge strain of ND virus positive	Lentogenic V4 or V4-like strain of ND virus positive	Other paramyxovirus positive
0	0	1	1

a Excludes testing for import purposes.

Salmonella surveillance

The National Enteric Pathogen Surveillance Scheme (NEPSS) is operated and maintained on behalf of the Australian Government and state and territory governments by the Microbiological Diagnostic Unit at the University of Melbourne. Data on isolates of *Salmonella* spp. and other pathogens are submitted to NEPSS from participating laboratories around Australia. Annual reports of both human and nonhuman isolates are available on request and detailed data searches are provided on request to NEPSS. Table 13 summarises *Salmonella* spp. isolations from animals reported to NEPSS.

Table 13 *Salmonella* notifications reported to the National Enteric Pathogen Surveillance Scheme (NEPSS), 1 April to 30 June 2019

Salmonella serovar	Birds[a]	Cats	Cattle	Dogs	Horses	Pigs	Sheep	Other	Total
Bovismorbificans	0	0	16	0	0	0	0	0	16
Dublin	0	0	10	0	0	0	0	0	10
Infantis	0	0	1	0	0	0	0	0	1
Typhimurium	3	1	17	1	1	1	3	0	27
Other	0	1	31	2	3	12	0	7	56
Total	**3**	**2**	**75**	**3**	**4**	**13**	**3**	**7**	**110**

a Includes both poultry and wild birds.

17 'Commercial chicken flocks' are defined in state and territory legislation.

Northern Australia Quarantine Strategy

In recognition of the unique biosecurity risks associated with Australia's extensive and sparsely populated northern coastline, the Australian Government Department of Agriculture conducts an animal disease surveillance program as an integral component of its Northern Australia Quarantine Strategy (NAQS). This surveillance program aims to provide early detection of exotic and emerging pests and diseases of significance to agriculture, public health and the environment. Information is derived from the use of sentinel animals, structured surveys, vector trapping and community reporting projects. In addition, NAQS contributes surveillance data to the National Arbovirus Monitoring Program (NAMP) and the electronic Wildlife Health Information System (eWHIS). Table 14 summarises NAQS animal testing for specific target diseases in Australia during the past five quarters.

Table 14 Disease testing and pest surveillance under the Northern Australia Quarantine Strategy (NAQS), 1 April 2018 to 30 June 2019

Target disease[a]	Apr–Jun 2018		Jul–Sep 2018[b]		Oct–Dec 2018		Jan–Mar 2019		Apr–Jun 2019	
	Tested	Positive	Tested	Positive	Tested	Positive	Tested	Positive	Tested	Positive
African swine fever	0	0	0	0	0	0	8	0	3	0
Aujeszky's disease	375	0	0	0	66	0	72	0	292	0
Avian influenza[c]	2	0	0	0	0	0	0	0	0	0
Classical swine fever	375	0	0	0	66	0	72	0	292	0
Japanese encephalitis	44	0	0	0	0	0	0	0	12	7[d]
Surra (*Trypanosoma evansi*)	410	0	12	0	79	0	89	0	336	0
Transmissible canine pancytopaenia (*Ehrlichia canis*)	0	0	0	0	0	0	0	0	92	0
Transmissible gastroenteritis	0	0	0	0	0	0	1	0	0	0

a Since the early 2019 update of the NAQS target list of diseases, extra diseases are now being reported to NAHIP and summarised here. This may evolve further.
b Logistical issues resulted in a reduction in NAQS activities during the quarter
c Excludes testing in wild birds.
d Japanese encephalitis virus (JEV) circulates seasonally in the islands of Torres Strait, but there is no conclusive evidence of JEV circulation on mainland Australia. No locally acquired human cases of clinical encephalitis associated with JEV infection have been confirmed in Australia since 1998. Surveillance of the susceptible animal population will continue.

Screw-Worm Fly Surveillance and Preparedness Program

The Old World screw-worm fly (OWS) and New World screw-worm fly (NWS), *Chrysomya bezziana* and *Cochliomyia hominivorax*, respectively, are exotic to Australia and suspicion of infestation in animals is notifiable under state and territory animal health legislation.[18] The OWS is a significant production disease of livestock throughout its range and is considered a greater threat to Australian livestock industries than NWS due to the proximity of its distribution to Australia (potential entry through the Torres Strait) and traffic of livestock export vessels returning from Asia to Australian ports. Surveillance is conducted by targeted fly trapping and livestock myiasis monitoring in addition to unplanned investigations of myiasis (reported in 'National notifiable animal disease investigations' and Table 17). Fly trapping is conducted at locations suitable for local OWS establishment following a potential incursion; in areas neighbouring livestock export ports and the Northern Peninsula Area (NPA) of Queensland. Table 15 summarises fly trapping events over the past year. No screw-worm flies were detected. Further information on the screw-worm fly program is available on the Animal Health Australia website.[19]

Table 15 Summary of fly trapping events conducted, 1 July 2018 to 30 June 2019[a]

Risk entry pathway	Conducted by	Jul–Sep 2018	Oct–Dec 2018	Jan–Mar 2019	Apr–Jun 2019
Torres Strait	NAQS	15	15	13	13
Livestock export ports	NT, Qld and WA governments	54	45	50	19

NAQS = Northern Australia Quarantine Strategy
a Excludes traps with identification results pending.

Public health

The National Notifiable Diseases Surveillance System (NNDSS) coordinates the national surveillance of more than 50 communicable diseases or disease groups. Unit records of disease notifications made to the state or territory health authority, under the provisions of the public health legislation in their jurisdiction, are supplied daily to the Office of Health Protection, Australian Government Department of Health. The data are published weekly on the NNDSS website[20] and quarterly in the journal *Communicable Diseases Intelligence* and are replicated in *Animal Health Surveillance Quarterly* (Table 16) for five important zoonoses.

Table 16 National notifications of five zoonotic infections in humans, 1 April 2018 to 30 June 2019

Quarter	Brucellosis[a]	Ornithosis[b]	Leptospirosis	Listeriosis	Q fever
Apr–Jun 2018	4	1	45	8	117
Jul–Sep 2018	5	3	23	12	125
Oct–Dec 2018	4	1	18	12	118
Jan–Mar 2019	2	4	26	17	165
Apr–Jun 2019					
ACT	0	0	0	2	0
NSW	0	1	3	4	37
NT	0	0	1	0	0
Qld	1	1	18	3	52
SA	0	1	1	0	4
Tas.	0	0	0	0	0
Vic.	0	1	6	1	13
WA	0	0	0	0	2
Aus.	**1**	**4**	**29**	**10**	**108**

a Bovine brucellosis (*Brucella abortus*) was eradicated from the Australian cattle herd in 1989 and is presently considered an exotic animal disease in Australia. Caprine and ovine brucellosis (caused by *B. melitensis*) has never been reported in Australian sheep or goats. Swine brucellosis (caused by *B. suis*) is prevalent in small areas of northern Australia and northern New South Wales where it occurs in feral pigs, with human cases predominantly seen in recreational feral pig hunters.
b Also known as 'psittacosis'.

18 Australian Government Department of Agriculture National List of Notifiable Animal Diseases www.agriculture.gov.au/pests-diseases-weeds/animal/notifiable (updated November 2015; cited 20 August 2019).

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

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

National notifiable animal disease investigations

During the quarter, 1221 national notifiable animal disease investigations[21] were conducted into suspect disease events. National notifiable animal diseases include a subset of emergency diseases.[22] Table 17 lists the confirmed results of these disease investigations. Note that more than one disease may be investigated for a single disease event (an outbreak of morbidity or mortality). In addition, a single investigation may involve more than one animal.

Details about selected investigations are provided in the 'State and territory reports' section of this publication and are available by contacting the relevant state or territory NAHIP coordinator (see contact details on last page).

Information regarding Australia's emergency preparedness and outbreak response management is available from the Australian Government Department of Agriculture.[23]

Table 17 Investigations for national notifiable animal diseases, 1 April to 30 June 2019

Disease	Species	Jurisdiction	No. of investigations	No. positive	No. negative
African swine fever	**Pig**	**National total**	**8**	**0**	**8**
		Qld	1	0	1
		SA	3	0	3
		Tas.	1	0	1
		WA	3	0	3
Anaplasmosis in tick-free areas	**Cattle**	**National total**	**3**	**0**	**3**
		NSW	2	0	2
		WA	1	0	1
Anthrax	**Cattle**	**National total**	**67**	**0**	**67**
		NSW	50	0	50
		NT	1	0	1
		Tas.	2	0	2
		Vic.	13	0	13
		WA	1	0	1
	Horse	**National total**	**1**	**0**	**1**
		NSW	1	0	1
	Sheep	**National total**	**14**	**0**	**14**
		NSW	4	0	4
		Vic.	9	0	9
		WA	1	0	1
Australian bat lyssavirus[a]	**Cattle**	**National total**	**1**	**0**	**1**
		NT	1	0	1
	Dog	**National total**	**2**	**0**	**2**
		NSW	1	0	1
		Qld	1	0	1
	Horse	**National total**	**9**	**0**	**9**
		Qld	8	0	8
		WA	1	0	1

Cont

a Australian bat lyssavirus (ABLV) testing in bats is reported on a 6-monthly basis in the Wildlife Health Australia report of AHSQ.

21 National List of Notifiable Animal Diseases at www.agriculture.gov.au/pests-diseases-weeds/animal/notifiable

22 Emergency Animal Disease Response Agreement, Schedule 3 at www.animalhealthaustralia.com.au/what-we-do/emergency-animal-disease/ead-responseagreement

23 www.agriculture.gov.au/animal/health/livestock-movement-australia

Disease	Species	Jurisdiction	No. of investigations	No. positive	No. negative
Avian influenza[b]	**Bird**	**National total**	**95**	**0**	**95**
		NSW	37	0	37
		NT	7	0	7
		Qld	12	0	12
		SA	11	0	11
		Tas.	4	0	4
		Vic.	10	0	10
		WA	14	0	14
Babesiosis in tick-free areas	**Cattle**	**National total**	**18**	**3**	**15**
		NSW	17	3	14
		WA	1	0	1
	Dog	**National total**	**1**	**0**	**1**
		Vic.	1	0	1
Bluetongue — clinical disease	**Cattle**	**National total**	**6**	**0**	**6**
		NSW	1	0	1
		Tas.	1	0	1
		WA	4	0	4
	Sheep	**National total**	**6**	**0**	**6**
		Qld	1	0	1
		SA	2	0	2
		WA	3	0	3
Bovine viral diarrhoea virus type 2 (BVDV-2)	**Cattle**	**National total**	**7**	**0**	**7**
		WA	7	0	7
Brucella abortus	**Cattle**	**National total**	**91**	**0**	**91**
		NSW	9	0	9
		Tas.	4	0	4
		Vic.	34	0	34
		WA	44	0	44
Brucella canis	**Dog**	**National total**	**2**	**0**	**2**
		NT	2	0	2
Brucella melitensis	**Sheep**	**National total**	**3**	**0**	**3**
		WA	3	0	3
Brucella suis	**Dog**	**National total**	**105**	**24**	**81**
		NSW	55	7	48
		Qld	50	17	33
	Pig	**National total**	**1**	**0**	**1**
		NSW	1	0	1
Contagious agalactia	**Sheep**	**National total**	**1**	**0**	**1**
		WA	1	0	1

Cont

b Excludes surveillance reported in the Wildlife Health Australia and Northern Australia Quarantine Strategy reports and testing conducted for import purposes.

Disease	Species	Jurisdiction	No. of investigations	No. positive	No. negative
Contagious equine metritis	**Horse**	**National total**	**1**	**0**	**1**
		WA	1	0	1
Encephalitides — tick-borne	**Sheep**	**National total**	**1**	**0**	**1**
		WA	1	0	1
Equine encephalomyelitis (Eastern, Western and Venezuelan)	**Horse**	**National total**	**9**	**0**	**9**
		Qld	3	0	3
		WA	6	0	6
Equine infectious anaemia	**Horse**	**National total**	**12**	**0**	**12**
		NSW	3	0	3
		Qld	8	0	8
		WA	1	0	1
Equine influenza	**Horse**	**National total**	**1**	**0**	**1**
		WA	1	0	1
Equine viral arteritis	**Horse**	**National total**	**1**	**0**	**1**
		WA	1	0	1
Foot-and-mouth disease	**Cattle**	**National total**	**13**	**0**	**13**
		NSW	3	0	3
		Qld	1	0	1
		SA	1	0	1
		Vic.	3	0	3
		WA	5	0	5
	Goat	**National total**	**1**	**0**	**1**
		NT	1	0	1
	Pig	**National total**	**1**	**0**	**1**
		Qld	1	0	1
	Sheep	**National total**	**4**	**0**	**4**
		SA	1	0	1
		WA	3	0	3
Haemorrhagic septicaemia	**Cattle**	**National total**	**2**	**0**	**2**
		NSW	1	0	1
		NT	1	0	1
Infection of bees with *Melissococcus plutonius* (European foulbrood)	**Bee**	**National total**	**80**	**15**	**65**
		NSW	34	9	25
		Qld	37	2	35
		SA	8	3	5
		Vic.	1	1	0
Infection of bees with *Paenibacillus larvae* (American foulbrood)	**Bee**	**National total**	**396**	**101**	**295**
		NSW	48	23	25
		Qld	37	24	13
		SA	143	15	128
		Vic.	168	39	129

Cont

Disease	Species	Jurisdiction	No. of investigations	No. positive	No. negative
Infection with African horse sickness virus	**Horse**	**National total**	**1**	**0**	**1**
		WA	1	0	1
Infection with Aujeszky's disease virus	**Cattle**	**National total**	**1**	**0**	**1**
		NT	1	0	1
	Pig	**National total**	**3**	**0**	**3**
		Vic.	3	0	3
	Sheep	**National total**	**1**	**0**	**1**
		WA	1	0	1
Infection with Borna disease virus	**Sheep**	**National total**	**1**	**0**	**1**
		WA	1	0	1
Infection with *Chlamydophila abortus* (enzootic abortion of ewes, ovine chlamydiosis)	**Sheep**	**National total**	**7**	**0**	**7**
		WA	7	0	7
Infection with classical swine fever virus	**Pig**	**National total**	**7**	**0**	**7**
		Qld	1	0	1
		SA	2	0	2
		Tas.	1	0	1
		WA	3	0	3
Infection with equid herpesvirus 1 (EHV-1) — abortigenic and neurological strains	**Horse**	**National total**	**109**	**4**	**105**
		NSW	56	3	53
		Qld	21	0	21
		SA	1	0	1
		Vic.	23	1	22
		WA	8	0	8
Infection with equine encephalosis virus	**Horse**	**National total**	**2**	**0**	**2**
		WA	2	0	2
Infection with Hendra virus	**Donkey**	**National total**	**2**	**0**	**2**
		Qld	2	0	2
	Horse	**National total**	**235**	**1**	**234**
		NSW	66	1	65
		NT	1	0	1
		Qld	142	0	142
		SA	3	0	3
		Vic.	15	0	15
		WA	8	0	8
	Pig	**National total**	**2**	**0**	**2**
		Qld	2	0	2
Infection with *Histoplasma farciminosum* (epizootic lymphangitis)	**Dog**	**National total**	**1**	**0**	**1**
		Vic.	1	0	1

Cont

Disease	Species	Jurisdiction	No. of investigations	No. positive	No. negative
Infection with influenza A viruses in swine	**Pig**	**National total**	**5**	**1**	**4**
		Vic.	2	1	1
		WA	3	0	3
Infection with *Mycoplasma mycoides* subsp. *mycoides* SC (contagious bovine pleuropneumonia)	**Cattle**	**National total**	**12**	**0**	**12**
		NSW	5	0	5
		NT	1	0	1
		WA	6	0	6
Infection with porcine epidemic diarrhoea virus	**Pig**	**National total**	**4**	**0**	**4**
		NSW	2	0	2
		Vic.	2	0	2
Infection with rabies virus	**Horse**	**National total**	**2**	**0**	**2**
		Vic.	1	0	1
		WA	1	0	1
Infection with *Salmonella abortus-equi*	**Horse**	**National total**	**2**	**0**	**2**
		WA	2	0	2
Infection with *Salmonella* Enteritidis in poultry	**Chicken**	**National total**	**126**	**12**	**114**
		NSW	123	12	111
		WA	3	0	3
Infection with swine vesicular disease virus	**Pig**	**National total**	**1**	**0**	**1**
		Qld	1	0	1
Infection with teschovirus A (porcine enteroviral encephalomyelitis)	**Pig**	**National total**	**1**	**0**	**1**
		Vic.	1	0	1
Infection with *Trypanosoma cruzi* — Chagas disease	**Dog**	**National total**	**1**	**0**	**1**
		WA	1	0	1
Infection with vesicular stomatitis virus	**Cattle**	**National total**	**12**	**0**	**12**
		NSW	3	0	3
		SA	1	0	1
		Vic.	3	0	3
		WA	5	0	5
	Goat	**National total**	**1**	**0**	**1**
		NT	1	0	1
	Pig	**National total**	**1**	**0**	**1**
		Qld	1	0	1
	Sheep	**National total**	**3**	**0**	**3**
		SA	1	0	1
		WA	2	0	2
Japanese encephalitis	**Horse**	**National total**	**3**	**0**	**3**
		WA	3	0	3

Cont

Disease	Species	Jurisdiction	No. of investigations	No. positive	No. negative
Leishmaniasis of any species	**Dog**	**National total**	**2**	**1**	**1**
		NSW	1	1	0
		Vic.	1	0	1
Louping ill	**Sheep**	**National total**	**1**	**0**	**1**
		WA	1	0	1
Lumpy skin disease	**Cattle**	**National total**	**2**	**0**	**2**
		NSW	1	0	1
		NT	1	0	1
	Goat	**National total**	**1**	**0**	**1**
		NT	1	0	1
Maedi-visna	**Sheep**	**National total**	**2**	**0**	**2**
		NSW	1	0	1
		WA	1	0	1
Malignant catarrhal fever — wildebeest-associated	**Cattle**	**National total**	**1**	**0**	**1**
		WA	1	0	1
Newcastle disease[c]	**Bird**	**National total**	**96**	**0**	**96**
		NSW	47	0	47
		Qld	12	0	12
		SA	10	0	10
		Tas.	3	0	3
		Vic	10	0	10
		WA	14	0	14
Paratuberculosis — Johne's disease	**Alpaca**	**National total**	**1**	**0**	**1**
		Vic.	1	0	1
	Camel	**National total**	**1**	**0**	**1**
		Qld	1	0	1
	Cattle	**National total**	**39**	**13**	**26**
		NSW	1	0	1
		Qld	5	0	5
		Vic.	15	13	2
		WA	18	0	18
	Goat	**National total**	**4**	**0**	**4**
		Qld	3	0	3
		WA	1	0	1
	Sheep	**National total**	**13**	**6**	**7**
		Vic.	8	6	2
		WA	5	0	5

Cont

c Excludes surveillance reported in the Wildlife Health Australia and Northern Australia Quarantine Strategy reports and testing conducted for import purposes.

Disease	Species	Jurisdiction	No. of investigations	No. positive	No. negative
Porcine reproductive and respiratory syndrome	**Pig**	**National total**	**2**	**0**	**2**
		Vic.	2	0	2
Post-weaning multi-systemic wasting syndrome	**Pig**	**National total**	**1**	**0**	**1**
		SA	1	0	1
Salmonellosis (*S. abortus-ovis*)	**Sheep**	**National total**	**5**	**0**	**5**
		WA	5	0	5
Screw-worm fly — New World (*Cochliomyia hominivorax*)	**Dog**	**National total**	**1**	**0**	**1**
		Qld	1	0	1
Screw-worm fly — Old World (*Chrysomya bezziana*)	**Dog**	**National total**	**1**	**0**	**1**
		Qld	1	0	1
Transmissible gastroenteritis	**Pig**	**National total**	**4**	**0**	**4**
		NSW	2	0	2
		Vic.	2	0	2
Transmissible spongiform encephalopathies (bovine spongiform encephalopathy, chronic wasting disease of deer, feline spongiform encephalopathy, scrapie)	**Cattle**	**National total**	**135**	**0**	**135**
		NSW	48	0	48
		NT	3	0	3
		Qld	24	0	24
		SA	13	0	13
		Tas.	5	0	5
		Vic.	35	0	35
		WA	7	0	7
	Sheep	**National total**	**132**	**0**	**132**
		NSW	28	0	28
		Qld	5	0	5
		SA	13	0	13
		Tas.	5	0	5
		Vic.	66	0	66
		WA	15	0	15
West Nile virus infection — clinical	**Horse**	**National total**	**23**	**0**	**23**
		NSW	11	0	11
		Qld	2	0	2
		WA	10	0	10
	Sheep	**National total**	**2**	**0**	**2**
		NSW	1	0	1
		WA	1	0	1

National Animal Health Information Program contacts

The National Animal Health Information Program database (**nahis.animalhealthaustralia.com.au**) collects summaries of animal health information from many sources; detailed data are maintained by the source organisations. Please contact the relevant person if further details are required.

EMERGENCY ANIMAL DISEASE WATCH HOTLINE

1800 675 888

There were 1200 calls to the Emergency Animal Disease Watch Hotline during the quarter.

The Emergency Animal Disease Watch Hotline is a toll-free telephone number that connects callers to the relevant state or territory officer to report concerns about any potential disease situation.

Anyone suspecting an exotic disease outbreak should use this number to get immediate advice and assistance.

1200 CALLS

THIS QUARTER

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