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# 3

## TERRESTRIAL ANIMAL DISEASE SURVEILLANCE AND MONITORING

The Australian Government and the state and territory governments regard disease surveillance and monitoring as a major function of the animal health system.

Australia's surveillance and monitoring capability is underpinned by a network of government field veterinary officers, government and private veterinary diagnostic laboratories, private veterinarians, researchers and livestock owners. This network implements surveillance plans to identify and treat risks from notifiable, emerging and exotic diseases. It is supported by the National Livestock Identification System (Chapter 1), which enables livestock to be identified and traced from property of birth to slaughter, and the National Animal Health Information System (NAHIS; Chapter 2) for collating data.

This chapter describes government and nongovernment programs that contribute to disease surveillance and monitoring capability at a national level. Surveillance and monitoring programs are listed in Box 3.1 and described in detail below.

### **Box 3.1 National surveillance and monitoring activities**

#### **Managed by Animal Health Australia**

- National Arbovirus Monitoring Program
- Transmissible Spongiform Encephalopathy Freedom Assurance Program
- Bovine Tuberculosis Surveillance Project
- National Sentinel Hive Program
- National Significant Disease Investigation Program

#### **Managed by the Australian Wildlife Health Network**

- Wildlife Health Information System and intelligence on diseases emerging from wildlife
- Wild Bird Surveillance Program
- Surveillance of bats

#### **Managed by other organisations**

- Pig Health Monitoring Scheme
- Ports Surveillance Program
- Bovine brucellosis surveillance
- Australian Veterinary Practitioner Surveillance Network

#### **Managed by state and territory governments**

- Field and laboratory diagnosis of significant livestock diseases
- Targeted surveillance for priority diseases
- Identification, research and reporting of emerging diseases
- Collection, collation and analysis of data and reporting of notifiable diseases
- Investigation of the epidemiology, distribution and prevalence of a wide range of animal diseases
- Investigations of suspected emergency animal diseases

#### **Private veterinarians' role in disease surveillance and management**

- Initial field investigations of suspect notifiable diseases
- Field surveillance of all animal diseases
- Endemic disease management programs (if contracted)

#### **Surveillance in northern Australia**

- Northern Australia Quarantine Strategy
- Animal biosecurity in the north Queensland tropics
- Japanese encephalitis surveillance

#### **Public health surveillance for zoonotic diseases**

- National Notifiable Diseases Surveillance System
- National Enteric Pathogen Surveillance Scheme

## **3.1 Surveillance programs managed by Animal Health Australia**

Animal Health Australia<sup>30</sup> (AHA) responds to members' needs for general and targeted national surveillance programs, and supports the Animal Health Committee in developing and implementing national surveillance policy. Surveillance programs managed by AHA are listed in Box 3.1. In addition, AHA enhances Australia's surveillance outputs by maintaining national data standards and supporting the wildlife coordinators managed by the Australian Wildlife Health Network (AWHN).

The National Animal Health Surveillance Strategy (2007) provides the framework for animal disease surveillance in Australia. The strategy covers the surveillance requirements to demonstrate Australia's animal health status, giving priority to areas that may affect human health, animal welfare, wildlife health, livestock productivity and market access.

In 2009, a surveillance strategy reference group reported its recommendations on Australia's future surveillance needs to the AHA board. The reference group's view was that Australia has a solid reputation internationally for its surveillance activities, and this reputation is critical to maintaining consumer confidence and market access for livestock products. The Australian animal disease surveillance system is effective in detecting new and emerging disease; however, it needs to improve if it is to meet future challenges. In making its recommendations, the reference group considered the national and international context, including the One World, One Health principle,<sup>31</sup> and the 'drivers' of future needs from government, industry and animal health perspectives.

In 2010, the Animal Health Committee started developing a national general surveillance plan, including the formation of a supporting working group on general surveillance epidemiology. The completed plan will guide AHA in negotiating with its members on potential improvements to the current AHA portfolio of surveillance programs.

### **3.1.1 National Arbovirus Monitoring Program**

The National Arbovirus Monitoring Program (NAMP) monitors the distribution of economically important

30 [www.animalhealthaustralia.com.au](http://www.animalhealthaustralia.com.au)

31 World Organisation for Animal Health (OIE) (2008). Press release: Avian Influenza International Ministerial Conference consolidated OIE approach. Sharm El Sheikh, 25–26 October 2008. ([www.oie.int/en/for-the-media/press-releases/detail/article/avian-influenza-international-ministerial-conference-consolidated-oie-approach-sharm-el-sheikh-25-2](http://www.oie.int/en/for-the-media/press-releases/detail/article/avian-influenza-international-ministerial-conference-consolidated-oie-approach-sharm-el-sheikh-25-2))

arboviruses (insect-borne viruses) of livestock and the vectors of these viruses in Australia. Important arboviruses include bluetongue, Akabane and bovine ephemeral fever (BEF) viruses.

Australia's economy benefits from the export of ruminants (for both slaughter and breeding) and their semen and embryos. This trade depends on a shared confidence between Australia and its trading partners that any risks to the animal health status of the importing country can be accurately assessed and properly managed. NAMP was established to provide credible data on the nature and distribution of important arboviral infections in Australia, for use by regulatory agencies in Australia and overseas, and by livestock exporters. The program enables the Australian Government to certify to trading partners that ruminants are sourced from areas free from important arboviruses. In addition, NAMP data assist overseas countries to develop animal health requirements for the importation of Australian livestock and livestock semen and embryos.

NAMP is jointly funded by its primary beneficiaries: the cattle, sheep and goat industries; the livestock export industry; and the state, territory and Australian governments.

### Objectives of NAMP

NAMP has three specific objectives:

- trade support — to facilitate the export of live sheep, goats, cattle and ruminant genetic material to countries with concerns about bluetongue, Akabane and BEF viruses by providing scientific information for developing animal health requirements and to meet export certification requirements
- bluetongue early warning — to detect incursions of exotic strains of bluetongue virus (BTV) and *Culicoides* midge species into Australia by surveillance of the northern BTV endemic area
- risk management — to detect changes in the seasonal distribution of endemic bluetongue, Akabane and BEF viruses and their vectors in Australia, in support of livestock exporters and producers.

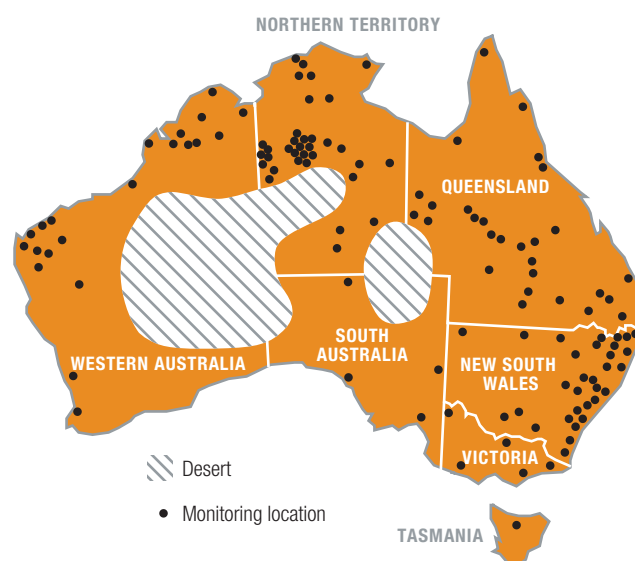
### Operation of NAMP

NAMP data are gathered throughout Australia by serological monitoring of cattle located in sentinel herds, strategic serological surveys of cattle herds and trapping of insect vectors. Blood samples from groups of young cattle that have not previously been exposed to arboviral infection are tested at regular intervals for evidence of recent or new infection with bluetongue, Akabane and

BEF viruses. The frequency of blood sampling relates to the probability of arbovirus transmission; that is, the greater the likelihood of virus transmission, the more frequent the sampling. Insect traps to detect *Culicoides* species — the vectors of BTV in Australia — are positioned near the monitored herds during the period of testing.

The number and locations of herds are selected to enable the distribution of important arboviruses to be determined. Hence, most sentinel sites are located either along the border between the zone where infection is expected and the zone where infection is not expected, or in areas where infection occurs sporadically. In addition, areas expected to be arbovirus free are monitored to verify their freedom, and known infected areas are sampled to assess the seasonal intensity of infection with each arbovirus. The location of monitoring sites in 2009–10 is shown in Figure 3.1.

To detect incursions of viruses from overseas, virus isolation tests (using culture) are routinely done on samples from one herd in the Northern Territory and two herds on Cape York in Queensland. Virus isolation tests are also applied strategically in other herds in the Northern Territory, Queensland and New South Wales after seroconversions are detected. NAMP surveillance data relating to bluetongue early warning are supplemented by the activities of the Northern Australia Quarantine Strategy (NAQS) in remote coastal regions of northern Australia, including the Torres Strait. NAQS undertakes a program of ongoing insect vector monitoring and animal health survey activities.



**Figure 3.1** The location of NAMP monitoring sites in Australia, 2009–10

## Monitoring data for 2009–10

This report describes the limits of vector and virus distribution, and the free areas for bluetongue, Akabane and BEF viruses in the 2009–10 arbovirus transmission season.

### Vector distribution and climate

The distribution of bluetongue, Akabane and BEF viruses across the Australian continent is determined by the distribution of insect vectors.

Vectors have complex interactions with geography, climate, the host animals and the viruses. These interactions result in the southern and inland areas of Australia being continuously free from livestock arboviruses. In the north, and in some of the eastern and western coastal areas, the distribution of arboviruses fluctuates from year to year, depending on the distribution of their insect vectors. The principal climatic factors influencing vector distribution are rainfall and temperature.

The biting midge, *Culicoides brevitarsis*, is the main vector of bluetongue and Akabane viruses in Australia. There is a close relationship between the southern Australian limits of this vector and the distribution of the viruses, although the viruses are less widely distributed than their vectors. Other vectors of BTV in Australia that are less widely distributed include *C. wadai*, *C. fulvus* and *C. actoni*. The main vector of BEF virus is believed to be the mosquito, *Culex annulirostris*. This mosquito is less susceptible to climatic extremes than *Culicoides brevitarsis* and often has a wider distribution.

In Western Australia, during the 2009–10 arbovirus season, rainfall was above average in the Kimberley region and below average throughout the rest of the state. *Culicoides* trapping occurred throughout the state, but vector species were found only in the Kimberley region, except for a single specimen of *C. wadai* that was collected at Karratha Station (Pilbara region). This is an extension of the known distribution of *C. wadai*; it is significantly to the west and south of the previous distribution from NAMP records at Kalumburu, Wyndham and Drysdale River in the Kimberley region. The only other vectors collected were *C. brevitarsis*, *C. actoni* and *C. fulvus* at Kalumburu in the far north.

In the Northern Territory, the wet season began later than usual (January), and rainfall was well above average in all regions. This resulted in a very wet season for the whole of the Northern Territory, particularly in the south, where the BTV zone was extended. The number of *C. brevitarsis* specimens collected and the duration of the seasonal

activity of *C. brevitarsis* were both similar to last year; this species was found at all the northern sites, including Garrithiya in east Arnhem Land (eastern Northern Territory) in most months. *C. actoni* was also widespread at the northern sites, but in lower numbers and not in all months. *C. wadai* and *C. fulvus* were more restricted in distribution, being found only in the far north at Beatrice Hill and at Garrithiya. No exotic species of *Culicoides* were found.

In Queensland, heavy rainfall over most of the state in January and February 2010 led to extensive flooding in the central and central–southern regions, extending to the south-west of the state. Some frosts occurred in May and June in the south, but winter was mild in the north. The distributions of *C. brevitarsis*, *C. wadai* and *C. actoni* were within previously recorded limits. *C. wadai* and *C. actoni*, which have a coastal distribution, were collected only at Maryborough. No exotic species of *Culicoides* were detected in Queensland.

In New South Wales, rainfall was average to above average across most inland areas and on the far south coast. The north, central coast and northern tablelands received average to below-average rainfall during the arbovirus season. Infrequent frosts occurred on the coastal plains to June. *C. brevitarsis* extended further south than in previous seasons, with its southerly limit at Nowra on the coast. As in the previous year, *C. wadai* was not detected in New South Wales.

Victoria experienced its wettest autumn since 2000. In particular, rainfall was above average in the northern Mallee and Northern Country regions. South Australia experienced significant inflows of water from the Queensland channel country. No vectors of BTV were detected in Victoria, South Australia or Tasmania.

### Bluetongue virus distribution

In Australia, clinical disease caused by BTV has never been reported in commercial sheep or cattle, or in any other susceptible species. The limits of BTV transmission in Australia are shown on the interactive BTV zone map,<sup>32</sup> which is based on World Organisation for Animal Health (OIE) guidelines and defines areas in which no viral transmission<sup>33</sup> has been detected for at least the past two years.

Monitoring data showed that BTV continued to be endemic in far northern Australia, including the Kimberley region of Western Australia, and occurred

32 [namp.animalhealthaustralia.com.au](http://namp.animalhealthaustralia.com.au)

33 Viral transmission is defined as detection or evidence of virus infection based on serological monitoring or sentinel cattle.

within the usual limits in the Northern Territory, Queensland and New South Wales (Figure 3.2, page 50).

In Western Australia, BTV was again detected in the Pilbara region — its previous southern zone limit — in mid-2010.

At Beatrice Hill in the far north of the Northern Territory, virus transmission occurred from December 2009 to June 2010. However, other northern sites (Katherine and Douglas Daly regions) had either no transmission or transmission only late in the season. BTV was detected in the southern Victoria River and Tennant Creek districts of the Northern Territory in 2009, requiring a small southward expansion of the BTV surveillance zone. Directly over the border in north-west Queensland, detections of BTV in the Boulia, Winton and Longreach shires also required small southward expansions of the transmission zone.

In New South Wales, BTV transmission was recorded from January to June and was limited to the existing zone of possible transmission. Transmission was detected from Lismore on the north coast to Paterson on the central coast and west to Scone in the Hunter Valley.

Routine typing of BTV isolates from healthy cattle in Queensland detected BTV-2 at Cooktown, Townsville and Jandowae, as well as BTV-1 and BTV-21 at several locations. BTV-2 has not previously been detected in Queensland; it was first detected in one sentinel herd in Darwin in the Northern Territory in 2008. Only BTV-1 was detected in samples from the Northern Territory. BTV-1 and BTV-21 were detected in New South Wales. All regions in southern Australia and most pastoral regions in eastern Australia remain BTV free.

### ***Akabane virus distribution***

Akabane virus was not detected in the southern states of South Australia, Victoria or Tasmania (Figure 3.3, page 50).

Monitoring data continued to show Akabane virus transmission in the Pilbara (two sites only) and Kimberley regions of Western Australia, throughout the north of the Northern Territory and in northern Queensland, where distribution of the virus was similar to that of BTV. In New South Wales, Akabane virus was detected more widely than in 2008–09, but only within the known endemic range. Transmission was detected along the coastal plain as far south as Camden by April, extending west onto the ranges and into the Hunter Valley.

In Queensland, the zone of Akabane virus transmission was similar to the BTV distribution, although transmission of Akabane virus began earlier in the season.

### ***Bovine ephemeral fever virus distribution***

The incidence of BEF virus infections was high in both New South Wales and Queensland (Figure 3.4, page 50). Cases were widely reported in central and southern regions of Queensland, and were widespread throughout New South Wales, following floods in January and February 2010. The range of BEF virus was greater than usual, extending across western and southern New South Wales and into Victoria and South Australia. Clinical cases of BEF were recorded in the first half of 2010 in the north and south of South Australia, and in March in northern Victoria, coinciding with above-average rainfall. The virus was detected along the New South Wales coast from the Queensland border and on the northern slopes of New South Wales in January. It was then detected in the central west, south coast, and northern and southern tablelands regions of New South Wales until April and May.

In Western Australia, BEF virus was detected at two sites in the Kimberley region, but not in the Pilbara. Virus transmission was extensive throughout the north of the Northern Territory. Clinically affected animals were reported in the Darwin and Katherine areas of the Northern Territory. BEF virus was not detected in the southern state of Tasmania.

## **3.1.2 Transmissible Spongiform Encephalopathy Freedom Assurance Program**

In 2010, Australia continued to be recognised as a country of negligible risk for bovine spongiform encephalopathy (BSE) and free from classical scrapie. These diseases are types of transmissible spongiform encephalopathies (TSEs). The purpose of the TSE Freedom Assurance Program (TSEFAP) is to enhance market confidence that Australian animals and animal products are free from TSEs. This is achieved through the structured and nationally integrated management of animal-related TSE activities.

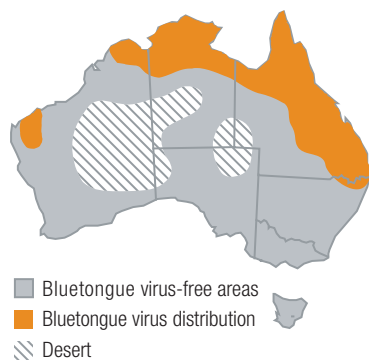
Projects that operate under the TSEFAP are:

- the National TSE Surveillance Program (NTSESP)
- ruminant feed ban inspections and testing
- imported animal surveillance, including traceback schemes for certain imported cattle
- communications.

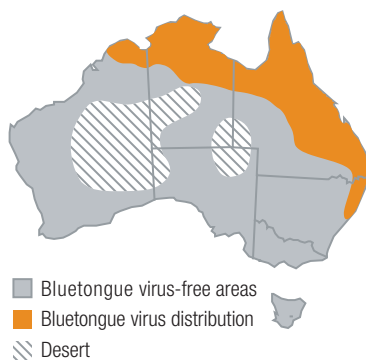
### ***National Transmissible Spongiform Encephalopathies Surveillance Program***

The NTSESP aims to demonstrate Australia's continuing ability to meet the requirements for a BSE negligible risk and classical scrapie-free country, and provide early

2007-08



2008-09



2009-10

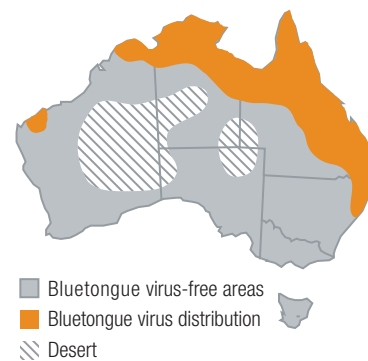
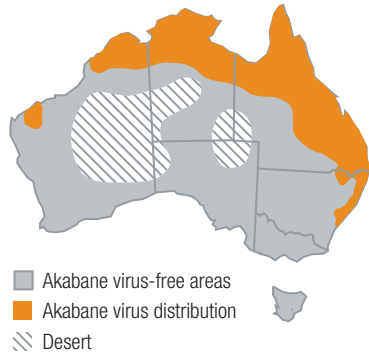
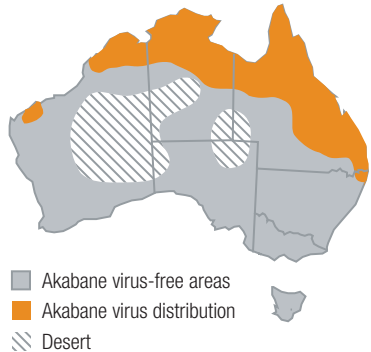


Figure 3.2 Distribution of bluetongue virus in Australia, 2007-08 to 2009-10

2007-08



2008-09



2009-10

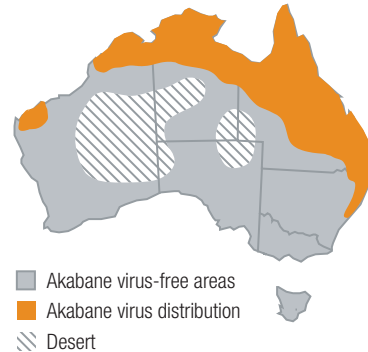
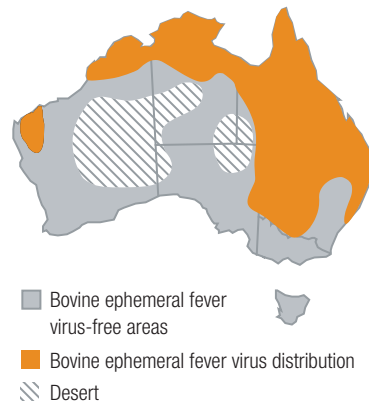
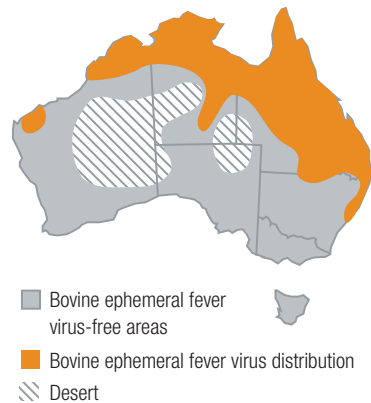


Figure 3.3 Distribution of Akabane virus in Australia, 2007-08 to 2009-10

2007-08



2008-09



2009-10

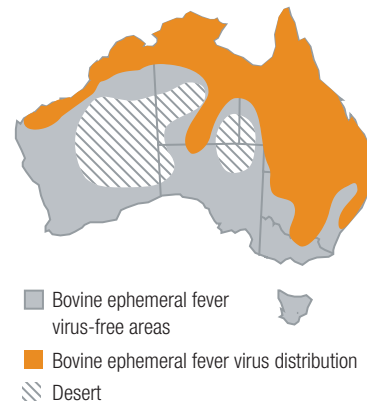


Figure 3.4 Distribution of bovine ephemeral fever virus in Australia, 2007-08 to 2009-10

**Table 3.1 Summary of results from the National Transmissible Spongiform Encephalopathies Surveillance Program, 2009–10**

State or territory	Cattle			Sheep	
	Number examined	Points <sup>a</sup>	Number positive	Number examined	Number positive
New South Wales	175	46 753.9	0	162	0
Northern Territory <sup>b</sup>	15	8 680.0	0	0	0
Queensland	276	75 395.0	0	19	0
South Australia	40	12 257.5	0	72	0
Tasmania	24	8 642.5	0	8	0
Victoria	214	77 035.9	0	140	0
Western Australia	77	23 063.0	0	159	0
<b>Total</b>	<b>821</b>	<b>251 827.8</b>	<b>0</b>	<b>560</b>	<b>0</b>

**a** Points are awarded according to the criteria in the OIE Terrestrial Animal Health Code.

**b** There are no commercial sheep farms in the Northern Territory.

detection of these diseases should they occur. It involves the collection of samples from ‘clinically consistent’ sheep and from ‘clinically consistent’,<sup>34</sup> ‘fallen’<sup>35</sup> and ‘casualty slaughter’<sup>36</sup> cattle. Details of the sampling program for sheep and cattle are provided in the NTSESP National Guidelines for Field Operations.<sup>37</sup>

For sheep, the NTSESP is a targeted surveillance program that has an annual sampling intensity designed to be 99% confident of detecting scrapie if it is present in at least one in a million adult sheep. This is achieved by the annual laboratory examination of a minimum of 450 sheep brains, collected from animals showing clinical signs of a neurological disorder (as stated in the OIE Terrestrial Animal Health Code<sup>38</sup>).

For cattle, Australia is assessed by the OIE as BSE ‘negligible risk’. This means that Australia should implement OIE Type B surveillance, which is designed to allow the detection of at least one BSE case per 50 000 in the adult cattle population at a confidence level of

95%. Surveillance points are assigned to cattle samples according to the animal’s age and subpopulation category (i.e. the likelihood of detecting BSE). Australia’s target is to achieve a minimum of 150 000 surveillance points during a seven-year moving window. Australia also aims to meet OIE recommendations to investigate all ‘clinically consistent’ cattle, and ensure that cattle from the fallen and casualty slaughter subpopulations are tested.

AHA manages the NTSESP with funding from 10 industry stakeholders (livestock and associated industries), the Australian Government, and the state and territory governments. Table 3.1 shows the results from the NTSESP for the 2009–10 financial year. Data for other periods are available from the NAHIS database.<sup>39</sup>

### *Australian ruminant feed ban scheme*

Since 1997, Australia has had a total ban on the feeding of ruminant protein to ruminants. In 1999, this ban was extended to cover feeding of specified mammalian materials to all ruminants. Since 2002, feeding of ruminants with any meals derived from vertebrates (including fish and birds) is not allowed. The ban is enforced under legislation in each state and territory and by a uniform approach to the inspection of all parts of the ruminant production chain.

In the 2009–10 financial year, 576 operations were inspected, from renderers to end users. This revealed 41 instances of noncompliance, none of which required prosecution. Approximately 10 505 audits were

34 A clinically consistent animal is defined by the AUSVETPLAN disease strategy for BSE as ‘an animal that is found with clinical signs considered consistent with BSE’. This is analogous with the term ‘clinical suspect’ used in the OIE Terrestrial Animal Health Code, Article 11.5.21, on surveillance for BSE.

35 Fallen cattle are defined by the OIE Terrestrial Animal Health Code, Article 11.5.21, as ‘cattle over 30 months of age which are found dead or killed on farm, during transport or at an abattoir’.

36 Casualty slaughter cattle are defined by the OIE as ‘cattle over 30 months of age that are non-ambulatory, recumbent, unable to rise or to walk without assistance; cattle over 30 months of age sent for emergency slaughter or condemned at ante-mortem inspection’.

37 [www.animalhealthaustralia.com.au/aahc/programs/adsp/tsefap/tse\\_ntsesp.cfm](http://www.animalhealthaustralia.com.au/aahc/programs/adsp/tsefap/tse_ntsesp.cfm)

38 [www.oie.int/en/international-standard-setting/terrestrial-code/access-online](http://www.oie.int/en/international-standard-setting/terrestrial-code/access-online)

39 [nahis.animalhealthaustralia.com.au](http://nahis.animalhealthaustralia.com.au)

completed through industry quality assurance programs during the same period. None required referral to the relevant central agency.

### Imported animal tracing

All cattle imported between 1996 and 2002 from countries that have experienced a native-born case of BSE are placed under lifetime quarantine, electronically tagged as part of the National Livestock Identification System for cattle, and inspected by government authorities every six months. These animals may not enter the human or animal feed chains. They are slaughtered and tested as part of the NTSESP, then incinerated or buried. The Cattle Council of Australia funds the removal of the cattle from the Australian herd.

### Program communications

During 2009–10, TSEFAP communications included:

- a pamphlet aimed at producers, informing them to supply the relevant government agencies (as part of the NTSESP) with sheep and cattle brains from any animals showing clinical signs similar to a TSE case
- a series of pamphlets for stockfeed manufacturers and users, promoting awareness of their responsibilities under the ruminant feed ban legislation
- a series of media releases on the ruminant feed ban and its importance in keeping the Australian ruminant industries free from TSEs.

### 3.1.3 Bovine Tuberculosis Surveillance Project

Australia's Brucellosis and Tuberculosis Eradication Campaign ran from 1970 to 1997, achieving freedom from bovine tuberculosis (TB) by OIE standards several years before the end of the campaign. The official declaration of freedom was made on 31 December 1997. The last cases of bovine TB were in December 2000 (in cattle) and January 2002 (in buffalo), during the Tuberculosis Freedom Assurance Program, Part 1.

The Australian Bovine Tuberculosis Surveillance Project 2007–2010,<sup>40</sup> which provided the framework for a nationally integrated approach to surveillance for TB, followed the Tuberculosis Freedom Assurance Program, Part 1 (1998–2002) and Part 2 (2003–06). The project concluded in December 2010, after a quantitative evaluation of surveillance data. No cases of TB were detected during the project.

The purpose of the Australian Bovine Tuberculosis Surveillance Project was to collect, analyse and report data from surveillance activities coordinated by the Australian Government and state and territory animal health agencies. Meat inspection for granulomas, which is conducted by the Australian Quarantine and Inspection Service (AQIS), has been the primary surveillance activity for bovine TB since 1992. This activity involves the submission of granulomas found in the head and thorax of slaughtered cattle for laboratory examination.

Other surveillance activities include the investigation of granulomatous lesions detected during the slaughter of deer, buffalo and camels for the domestic market, and testing of cattle before live export where this is a requirement of import conditions. The single intradermal caudal fold test, the main diagnostic tool for detection of TB in cattle during the Brucellosis and Tuberculosis Eradication Campaign, is performed by an AQIS-accredited veterinarian.

In 2010, bovine TB surveillance data were evaluated quantitatively using a scenario tree methodology,<sup>41</sup> which enabled the analysis of multiple sources of surveillance data collected over a number of years. The aim was to estimate the sensitivity of historical surveillance practices and quantify the level of certainty in Australia's freedom from bovine TB. The analysis provided a very high level of confidence (approaching 100%) that Australia is free from bovine TB and that, if the disease were present, it would have been detected.

In the unlikely event of a bovine TB case occurring, eradication activities will be guided by the current Bovine Tuberculosis Case Response Manual — Managing an Incident of Bovine Tuberculosis,<sup>42</sup> which is endorsed by cattle industry representatives. This provides for an 'approved property or herd' eradication program agreed by the owner and the relevant jurisdictional government. Funding agreements, including reimbursement for destroyed livestock, are included in the Government and Livestock Industry Cost Sharing Deed in Respect of Emergency Animal Disease Responses.<sup>43</sup>

Australia continues to exceed OIE requirements for bovine TB surveillance in a free country. As part of ongoing surveillance, any granuloma of uncertain cause (particularly if it is in a lymph node in the head or lungs of cattle with two or more permanent teeth) and

40 [www.animalhealthaustralia.com.au/programs/adsp/abtbsp/abtbsp\\_home.cfm](http://www.animalhealthaustralia.com.au/programs/adsp/abtbsp/abtbsp_home.cfm)

41 P Martin, A Cameron and M Greiner (2007). Demonstrating freedom from disease using multiple complex data sources 1: a new methodology based on scenario trees. *Preventive Veterinary Medicine* 79:71–97.

42 [www.animalhealthaustralia.com.au/programs/adsp/abtbsp/abtbsp\\_home.cfm](http://www.animalhealthaustralia.com.au/programs/adsp/abtbsp/abtbsp_home.cfm)

43 [www.animalhealthaustralia.com.au/programs/eadp/eadra.cfm](http://www.animalhealthaustralia.com.au/programs/eadp/eadra.cfm)

granulomas suspected of being due to bovine TB (at the discretion of the inspector) are submitted for laboratory examination. Summary surveillance data are reported online by NAHIS<sup>44</sup> and in *Animal Health Surveillance Quarterly*,<sup>45</sup> published by AHA. The Australian Reference Laboratory for Bovine Tuberculosis (at the Department of Agriculture and Food Western Australia) provides quality assurance for surveillance and supports epidemiological investigations.

### 3.1.4 National Sentinel Hive Program

The National Sentinel Hive Program (NSHP) was established in 2000 to improve post-border monitoring around Australia for exotic pests of honey bees, including varroa mite (*Varroa destructor* and *V. jacobsoni*), tropilaelaps mite (*Tropilaelaps clareae*), tracheal mite (*Acarapis woodi*); and to monitor for Asian honey bee (*Apis cerana*) incursions. Early detection of these exotic pests is critical to eradicating an incursion, and to limiting the size and cost of an eradication program.

The program is implemented nationally through the expertise of state apiary officers and cooperating beekeepers. AHA is contracted by the Australian Government Department of Agriculture, Fisheries and Forestry to deliver the program services, including quarterly inspections (sentinel bee hives and coconut log traps), subsequent laboratory work and reporting of results to NAHIS.

In 2010, the Rural Industries Research and Development Corporation completed a review of bee pest and disease surveillance activities in Australia. This included identifying any changes required to the operations of the NSHP.

During 2010, 34 sentinel hives for bee parasites were maintained at sea ports and airports across Australia that receive significant volumes of imported cargo or regular berthing of vessels from international locations where exotic pests of honey bees are known to occur. In addition, 15 coconut log traps for *A. cerana* were maintained at the ports of Darwin, Gove and Brisbane. Trap boxes (empty hives) are deployed at many southern ports as an additional surveillance measure for detecting swarms of exotic bees. Experience suggests that these trap boxes are highly attractive to swarming bees. Tables 3.2 and 3.3 show sample data for sentinel hives and coconut log traps located at Australian ports in 2010.

As well as providing early detection of exotic bee parasites and bees, the NSHP supplies data to support health certification for exports of live bees.

**Table 3.2 Samples examined for parasites of bees and pest bee species (by state or territory), 2010**

State or territory	Samples examined
New South Wales	32
Northern Territory	88
Queensland	98
South Australia	18
Tasmania	14
Victoria	21
Western Australia	60
<b>Total</b>	<b>331</b>

**Table 3.3 Samples examined for parasites of bees and pest bee species (by agent), 2010**

Agent	Samples examined
<i>Apis cerana</i>	124
Tracheal mite	103
Varroa/tropilaelaps mite	104
<b>Total</b>	<b>331</b>

Chapter 4 (Managing animal health emergencies) provides an update on the emergency response to an incursion of *A. cerana* by Queensland Primary Industries and Fisheries.

### 3.1.5 National Significant Disease Investigation Program

Ongoing general surveillance<sup>46</sup> is important in maintaining Australia's favourable animal health status and ensuring early detection of animal disease emergencies. Its value has been demonstrated by the early detection of outbreaks of emergency diseases in Australia: Menangle virus in a New South Wales piggery in 1997, sporadic Hendra virus infection in Queensland horses since 1994, and sporadic anthrax in New South Wales and Victoria.

Veterinary practitioners play a key role in general surveillance in Australia, providing expertise for evaluating, clinically investigating and reporting outbreaks of significant disease in animals. The National Significant Disease Investigation Program (NSDIP) was initiated to encourage full investigations, which can be

44 [nahis.animalhealthaustralia.com.au](http://nahis.animalhealthaustralia.com.au)

45 [www.animalhealthaustralia.com.au/status/ahsq.cfm](http://www.animalhealthaustralia.com.au/status/ahsq.cfm)

46 General surveillance, which is often opportunistic, is based on a network of people and organisations that detect, investigate and diagnose morbidity and mortality events.

limited by competing priorities and commercial realities, such as the low economic value of individual animals relative to the cost of veterinary services.

The NSDIP, managed by AHA,<sup>47</sup> began in June 2009. Funded from livestock industry and government subscriptions, the program aims to boost Australia's capacity for the early detection of emerging and emergency animal diseases (EADs) by increasing the participation of veterinary practitioners in disease investigations. Registered, nongovernment veterinarians engaged in clinical veterinary medicine — including veterinary practitioners in wildlife parks — are eligible to participate in the program. Significant diseases are broadly defined as those that may impact trade or market access, farm productivity, public health or wildlife biodiversity conservation.

Subsidies are available for the initial clinical evaluation and a follow-up investigation, if required. In return, the practitioner must provide a case report of the investigation to their government animal health authority.

During the financial year 2009–10, a subsidy was paid and data were collected for 220 cases. A budget has been provided to support the investigation of approximately 360 cases in livestock and wildlife across Australia in 2010–11.

Section 3.5 provides further information on the role of private veterinary practitioners in disease surveillance and management.

### 3.2 Programs and activities managed by the Australian Wildlife Health Network

Wildlife disease surveillance is coordinated nationally through the AWHN, with a wildlife coordinator in each state and territory. The network promotes and facilitates collaboration around Australia in the investigation and management of wildlife health, focusing on potential risks to human and animal health, trade and biodiversity. In addition to surveillance, the AWHN assists with disease investigations and research in wildlife and feral animals, and facilitates education and training to ensure that Australia is well prepared for serious disease outbreaks in livestock, and wild and feral animal populations. Surveillance is focused on six disease categories: diseases listed by the OIE, bat viral diseases, mass or unusual mortality events, *Salmonella* cases, arbovirus infections, and diseases that wildlife coordinators consider unusual or interesting. The AWHN administers a 'first alert system', which allows email

alerts to be sent to over 1000 individuals and agencies around Australia with an interest in wildlife health issues. The network also produces weekly electronic digests of wildlife health information relevant to Australia. These digests are circulated nationally and to OIE member countries within the region.

In 2010, the focus of activities for AWHN was:

- assisting Australia's states, territories and national agencies in general wildlife health surveillance and coordination for wildlife disease incidents
- supporting the work of NAHIS
- assisting AHA in its efforts to incorporate wildlife into the NSDIP
- providing wildlife health information for national and international reports prepared by the Australian Government
- managing and coordinating the avian influenza surveillance program in wild birds
- assisting the review of Australia's emergency veterinary plan for rabies
- coordinating a network of wildlife health expertise, including organising working groups with a particular focus (e.g. a group focusing on university researchers' contributions to national wildlife health issues; a group focusing on Australian bat lyssavirus (ABLV); and a group focusing on the zoo industry and their wildlife hospitals, the Zoo Animal Health Reference Group) and encouraging collaboration, communication and engagement among federal, state and local government and nongovernment agencies
- assisting the Animal Health Committee on a working group examining the development of a national general animal disease surveillance plan that includes wildlife.

The Zoo Animal Health Reference Group (ZAHRG), which is coordinated by the AWHN, includes representatives from Australia's major zoos and provides advice to the Australian Chief Veterinary Officer. In 2010, ZAHRG considered the zoo-based wildlife disease surveillance pilot project. This is a collaborative project between the peak body representing Australian zoos (the Zoo and Aquarium Association), ZAHRG, the AWHN, Australia's states and territories, the Australian Government and the Australian Centre of Excellence for Risk Analysis. The project uses the wildlife health expertise in Australian zoos and zoo-based wildlife health hospitals, and their examination of about 10 000 free-living wild and feral animals each year. Six major Australian zoos are taking part in the 12-month pilot project, in which disease

47 [www.animalhealthaustralia.com.au/programs/adsp/sdi.cfm](http://www.animalhealthaustralia.com.au/programs/adsp/sdi.cfm)

events in free-ranging wildlife and wildlife in rehabilitation centres will be reported by zoo veterinarians directly into the National Wildlife Health Information System to support NAHIS. At the end of the trial, an independent review will assess the value of the program and the potential for its expansion into other zoos and wildlife parks around Australia.

More than 500 wildlife disease investigation events were added to the national database in 2010. About half of these events were bats submitted for exclusion testing for ABLV. Wild bird mortalities, which accounted for around one-fifth of the events, were not typical of deaths due to highly pathogenic avian influenza (HPAI); where appropriate, avian influenza was excluded in these events. Findings in bird mortality events included trauma, poisonings, cryptosporidiosis, aspergillosis, mycobacteriosis, avian chlamyphilosis, botulism and salmonellosis.

### 3.2.1 Avian influenza surveillance in wild birds

National surveillance activities for avian influenza in wild birds target a combination of healthy, live and hunter-killed wild birds, and sick or dead wild birds. Sources for targeted wild bird surveillance data include state and territory government agencies, universities, the Victorian Waders Study Group, and samples collected through the NAQS program. Samples from sick birds include submissions from members of the public, private practitioners, universities, zoos and wildlife sanctuaries. In 2010, targeted wild bird surveillance occurred in New South Wales, Queensland, Victoria, Tasmania, South Australia, the Northern Territory and Western Australia, with a total of 9806 birds sampled. The majority of samples were collected from waterbirds (ducks and waders). No HPAI viruses were identified.

### 3.2.2 Surveillance of bats

Surveillance of bats, which has a particular focus on pathogens threatening livestock and public health, targeted five agents in 2009–10: ABLV, coronaviruses, Hendra virus, leptospires and Nipah virus. Nipah virus and the coronaviruses responsible for severe acute respiratory syndrome (SARS) have not been found in Australian bats. Surveillance outcomes also increased understanding of the ecology of diseases of Australian bats. In other countries, diseases of bats can alter bat-facilitated pollination and insect control in ecosystems. Information about bat diseases in Australia will assist in informing activities to safeguard Australia's biodiversity.

State animal and public health laboratories and the Commonwealth Scientific and Industrial Research

Organisation (CSIRO) Australian Animal Health Laboratory (CSIRO-AAHL) continue to screen Australian bats for ABLV. A total of 208 bats were tested for ABLV in 2010. Of these, seven tested positive: one grey-headed flying fox (*Pteropus poliocephalus*), five little red flying fox (*Pteropus scapulatus*) and one animal identified as *Pteropus* sp. The AWHN coordinates a working group that focuses on improving national coordination of issues associated with ABLV.

The AWHN also collates and publishes national ABLV test results, in collaboration with NAHIS. In 2010, the newly formed Queensland Centre for Emerging Infectious Diseases analysed the national dataset, with the aim of advancing understanding of ABLV disease ecology, and improving risk management of human exposure to ABLV. The report of the analysis<sup>48</sup> concluded that all Australian bat species are susceptible to ABLV. Although infection is rare in surveyed wild-caught populations, ABLV is markedly over-represented in the subset of sick and injured bats rescued by people, and thus poses a significant public health risk. Bats that do not demonstrate any of the classical signs of ABLV infection may still be infected with the virus. The public health message is that people coming into contact with a bat should be aware of the potential risks, even if the bat appears clinically normal.

In response to the recent cases of Hendra virus in Queensland, Biosecurity Queensland (in collaboration with the CSIRO-AAHL) will continue to survey Australian bats for evidence of infection with Hendra or Nipah viruses. The Queensland Centre for Emerging Infectious Diseases will target Hendra virus. Key research objectives are to understand the disease ecology and epidemiology of Hendra virus, including bat–virus interactions and strain diversity, bat–horse interactions and the transmission pathway, and spatial and temporal patterns of infection.

## 3.3 Programs and activities managed by other organisations

### 3.3.1 Pig Health Monitoring Scheme

The Pig Health Monitoring Scheme involves visual examination of pig carcasses and organs at slaughter for the presence of 11 disease conditions that may limit production. These include enzootic pneumonia, pleuropneumonia, pleurisy, mange and ileitis. Participants in five states conduct abattoir inspections; herd coverage is estimated at 50% of Australia's pig

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48 [www.wildlifehealth.org.au](http://www.wildlifehealth.org.au)

production. Disease reports, which can validate disease management practices, are then generated by Pigmon 3 software and sent to producers and their veterinarians. From 2007, collection and quality assurance of data have been the responsibility of participating states.

### 3.3.2 Ports Surveillance Program

The Ports Surveillance Program is conducted for screw-worm fly and *Culicoides* midges (the insect vector for BTV and Akabane virus in Australia), as seaports that service returning livestock vessels are considered to be high-risk locations for incursions of these pests. Both activities were managed by Biosecurity Australia, until AHA assumed responsibility for the screw-worm fly program in the second half of 2010. Biosecurity Australia retained management of the *Culicoides* activities.

#### Screw-worm fly surveillance

Screw-worm fly surveillance conducted as part of the Ports Surveillance Program increases the capacity for early detection of screw-worm fly incursions, which increases the probability of a successful eradication program. The surveillance data are provided to the Screw-Worm Fly Freedom Assurance Program, which also brings together relevant surveillance data from NAQS operations in the Torres Strait, myiasis reporting (including data from AQIS meat inspection and activities of Australia's livestock industries) and negative surveillance data.

#### Culicoides

*Culicoides* surveillance supports the livestock export trade by confirming the continuous or seasonal absence of *Culicoides* vectors at ports from which livestock are loaded.

### 3.3.3 Bovine brucellosis surveillance

After an eradication campaign that began in 1970, Australia achieved freedom from bovine brucellosis (caused by *Brucella abortus*) in July 1989, and remains bovine brucellosis free. Targeted serological surveillance, performed by serological testing of blood samples collected from adult female cattle at slaughter, continued until the end of 1993. Since then, extensive general surveillance by investigation of abortions has demonstrated ongoing freedom from bovine brucellosis.

Table 3.4 shows the number of serological tests for *B. abortus* carried out at state veterinary laboratories as part of abortion investigations. Table 3.5 shows the number of tests performed for other reasons, such as export requirements. Sampling is conducted on other species, as shown in the tables, on an ad hoc basis.

## 3.4 Surveillance programs managed by state and territory governments

Most of the infrastructure for general animal disease surveillance is provided and coordinated by state and territory governments. State and territory laws require animal owners and veterinarians to report to animal health authorities any suspicion of 'notifiable' diseases — that is, diseases that may require government intervention and management. The identification of emerging diseases such as ABLV, Hendra virus disease of horses and Bungowannah virus infections of pigs is part of the surveillance role of the states and territories.

The state and territory governments employ networks of official field veterinarians and diagnostic veterinary laboratory pathologists to gather intelligence about notifiable diseases. In some cases, private veterinary practitioners are contracted to the government for this work. Governments also contract and liaise with the private sector to ensure that surveillance for these diseases is effective. Through these networks, as well as through their research and extension facilities, they obtain knowledge of the distribution and prevalence of a wide range of animal diseases, not just the notifiable ones.

State and territory government surveillance plans have a common objective — to ensure that relevant information from general animal disease surveillance is readily available for assessing and managing risks to trade in livestock and products, public health and animal production efficiency. Historically, this has led to:

- early detection of emergency and emerging diseases
- demonstration of freedom from diseases or disease agents
- determination of, and detection of changes in, the distribution, prevalence and incidence of diseases and disease agents
- detection of changes in factors or events that influence the risk of diseases.

Official veterinarians in regions of the state or territory attend disease outbreaks that a private practitioner cannot attend, or that may be a suspected endemic notifiable disease or exotic animal disease. Incursions or outbreaks of diseases such as avian influenza, anthrax, equine influenza and Newcastle disease have been detected in this way. When high levels of mortality are beyond the investigative and resource capacity of owners and private veterinarians, the disease investigation may require the services of a government veterinarian. Most investigations are not emergencies, but government veterinarians have ready

access to equipment that minimises the risk that they will spread any diseases from farm to farm. Government veterinarians are also skilled in postmortem examination and diagnosis.

Samples for laboratory confirmation or exclusion of disease are quickly taken and dispatched. Laboratory diagnosis is free of charge to the submitter for many categories of submission. Samples may be submitted to government laboratories with access to specialist diagnostic pathologists or to contracted private laboratories that meet prescribed standards. In all cases of suspected exotic or EADs, samples are also submitted to CSIRO-AAHL in Geelong.

Laboratory quality assurance is maintained by compulsory accreditation by the National Association of Testing Authorities, as well as compulsory participation in interlaboratory quality assurance programs.

The information collected by state and territory field and laboratory staff is recorded in information management systems. Property of origin health certificates and official reports of regional and national disease status to various authorities (including the OIE) can readily be extracted from these systems. The information is also fed back to the veterinary networks through surveillance reports that keep state and territory field and laboratory staff informed about disease patterns.

Many official veterinarians conduct targeted animal disease surveillance projects with the aim of publishing the information in refereed journals and presenting it at national and international conferences. This leads to the development and maintenance of specialist epidemiology units that can apply the most recent surveillance tools to the analysis of existing or emerging animal diseases.

**Table 3.4 Serological tests for *Brucella abortus* in Australia, abortion serology, 2004–10**

Livestock species	Number of tests <sup>a</sup>						
	2004	2005	2006	2007	2008	2009	2010
Cattle	959	1165	746	293	626	289	1313
Horse	0	0	1	0	0	0	0
Sheep	0	0	18	0	0	0	0
<b>Total</b>	<b>959</b>	<b>1165</b>	<b>765</b>	<b>293</b>	<b>626</b>	<b>289</b>	<b>1313</b>

<sup>a</sup> All test results were negative for *Brucella abortus*.

Note: In previous years, Animal Health in Australia presented aggregated totals for brucellosis surveillance.

**Table 3.5 Serological tests for *Brucella abortus* in Australia, other serology, 2004–10**

Animal species	Number of tests <sup>a</sup>						
	2004	2005	2006	2007	2008	2009	2010
Alpaca	0	0	8	0	0	8	0
Cattle	8 036	4 975	9 875	13 209	9 860	5 672	11 398
Deer	0	0	0	519	0	53	0
Dog	0	0	7	0	0	0	0
Goat	0	0	473	2 190	0	905	0
Horse	0	0	8	9	0	0	2
Pig	0	0	22	0	0	33	0
Sheep	0	37	361	273	45	5	0
<b>Total</b>	<b>8 036</b>	<b>5 012</b>	<b>10 754</b>	<b>16 200</b>	<b>9 905</b>	<b>6 676</b>	<b>11 400</b>

<sup>a</sup> All test results were negative for *Brucella abortus*.

Note: In previous years, Animal Health in Australia presented aggregated totals for brucellosis surveillance.

## 3.5 Private veterinarians' role in disease surveillance and management

Private veterinary practitioners contribute to national surveillance programs, particularly the National Transmissible Spongiform Encephalopathies Surveillance Program, and information about on-farm investigations conducted by nongovernment veterinarians is collected through the Australian Veterinary Practitioner Surveillance Network. Australia's states and territories have legislation that requires all farmers, private veterinary practitioners and laboratories to report suspicion or confirmation of a notifiable disease (see Section 3.1.5).

### 3.5.1 New South Wales

In New South Wales, investigation of suspect notifiable diseases usually occurs after private practitioners submit diagnostic specimens to a veterinary laboratory in the New South Wales Department of Industry and Investment. District government veterinary officers collate data from these investigations, and often assist in the investigation or manage cases referred by private practitioners. Private practitioners receive subsidised laboratory testing for cases in which notifiable diseases are suspected. They also receive training in sample submission and disease investigation for some notifiable diseases.

### 3.5.2 Northern Territory

Private practitioners in the Northern Territory are asked to report significant animal disease events to veterinary officers in the Northern Territory Department of Resources, who manage the investigations. Practitioners are encouraged to submit livestock samples for laboratory investigation, which is performed free of charge.

### 3.5.3 Queensland

Private veterinary practitioners involved in large animal and equine practice are regularly visited or contacted by veterinary or biosecurity officers from the Queensland Department of Employment, Economic Development and Innovation to discuss disease incidents in their area. Private practitioners are reminded of the importance of reporting significant animal disease events, including notifiable diseases and suspect EADs. In response to outbreaks of Hendra virus, the department has increased the frequency and content of these contacts and has prepared a package of printed material to promote the management of zoonoses. The department conducts occasional training sessions with private practitioners, focusing on the use of personal protective equipment in Hendra virus investigations.

Departmental veterinary officers also work with private veterinary consultants in the intensive pig and poultry industries to manage serious disease issues. The department funds a senior veterinary pathologist to assist private practitioners and field veterinary officers to investigate complex disease cases, particularly where no clear cause for the problem has been identified.

### 3.5.4 South Australia

The Biosecurity Division of the Department of Primary Industries and Resources South Australia (Biosecurity SA) maintains close communication with rural private veterinary practitioners. Biosecurity SA has an Enhanced Disease Surveillance Program to promote investigations of disease incidents in South Australian livestock. The program funds laboratory submissions for suspect infectious diseases in livestock and reimburses contracted private veterinary practitioners for costs incurred investigating unusual disease events. Biosecurity SA also offers training and refresher courses in necropsy technique and disease investigations to practitioners, as well as providing ongoing technical support when required.

### 3.5.5 Tasmania

The Tasmanian Department of Primary Industries, Parks, Water and Environment contracts veterinary practices to supply syndromic information from visits to farms and from wildlife presented to their practices. The contracted practices also conduct disease investigations at the request of the department and provide field surveillance veterinarians during emergency disease responses; specific training is provided for these veterinarians. In addition to the contract, the department participates in the NSDIP, involving noncontracted veterinarians.

### 3.5.6 Victoria

Since 2005, private veterinary practitioners in Victoria have investigated significant disease events as part of the Victorian Significant Disease Investigation program. Participating practitioners receive a payment from the Victorian Department of Primary Industries for reporting the investigation and a subsidy towards laboratory investigation costs. In 2010, the department also introduced a subsidy for cattle, sheep and goat owners who initiate an investigation of a significant disease event, to partially cover the cost of engaging a veterinary practitioner. During 2010, 209 significant disease events were investigated and reported by private veterinary practitioners in Victoria.

Private veterinary practitioners are also contracted by the Department of Primary Industries to undertake on-farm activities associated with endemic disease management programs, including for bovine Johne's disease and enzootic bovine leucosis.

In 2010, the department offered two short courses in livestock disease investigation methods for private veterinary practitioners. Both courses were well attended.

### 3.5.7 Western Australia

In recent years, Western Australia has promoted surveillance and reporting of significant livestock disease events by private practitioners through personal networking by departmental veterinary officers, regional training workshops in disease investigation and the production of a quarterly surveillance newsletter. Laboratory diagnostic work on cases of suspect notifiable diseases, or cases that are considered to be of public benefit, is exempt from laboratory charges.

During 2010, the NSDIP and the Department of Agriculture and Food Western Australia sponsored more than 100 investigations of significant ill health in livestock, including payment of travel costs, waiving of laboratory fees and assistance with collecting and dispatching samples. Practitioners, district veterinary officers and pathologists liaise closely under the program.

### 3.5.8 Australian Veterinary Practitioner Surveillance Network

The Australian Veterinary Practitioner Surveillance Network (AVPSN) is a web-based system designed to collect information about on-farm investigations by nongovernment veterinarians, complementing surveillance undertaken by jurisdictional field services. Veterinarians are recruited strategically across Australia's animal production regions, ensuring geographic coverage as well as coverage of the range of livestock industries and animal production systems in Australia. In particular, the AVPSN collects data on the frequency of on-farm investigations by selected nongovernment veterinarians. The data are organised geographically, by livestock type and by reasons and outcomes for farm visits.

The network improves Australia's disease-free reputation by providing quantitative evidence of the amount of farm-level passive surveillance performed by a selected group of nongovernment veterinarians. The network also raises awareness of EADs among practitioners working in all production areas of Australia.

The AVPSN was initiated by the Australian Government and is managed by the Australian Government Department of Agriculture, Fisheries and Forestry; it reports annually to NAHIS.

## 3.6 Surveillance programs in Northern Australia

### 3.6.1 Northern Australia Quarantine Strategy

NAQS is an AQIS program that operates across coastal northern Australia, from Broome in Western Australia to Cairns in Queensland, including the Torres Strait.

NAQS contributes to national biosecurity through:

- identifying and evaluating the unique quarantine risks facing northern Australia
- developing and implementing measures for the early detection of targeted pests, diseases and weeds
- contributing to national and international initiatives relating to targeted pest and disease monitoring of relevance to the strategy's domestic surveillance
- managing the quarantine aspects of border movements through the Torres Strait.

NAQS surveillance objectives are delivered through a program of integrated activities, including:

- animal and plant health surveillance for targeted pests, weeds and diseases
- stakeholder and community engagement
- capacity building for onshore surveillance, particularly with Indigenous communities.

In addition to the activities undertaken in northern Australia, NAQS scientists contribute to collaborative capacity building and animal health surveillance in Papua New Guinea, Indonesia and Timor-Leste. These activities are coordinated by the Office of the Chief Veterinary Officer. (See Chapter 9 for further information on regional animal health initiatives.)

#### *Strategy priorities*

NAQS continued to focus on increasing Indigenous community engagement in surveillance and pest mitigation strategies in coastal northern Australia. Services provided by Indigenous communities in 2010, largely delivered through established Land & Sea Ranger programs, included brokering access for NAQS survey teams to Indigenous land, sampling feral animals, pest trapping and coastal patrol activities.

NAQS also continued to contribute to national surveillance in wild birds for avian influenza viruses,

with a focus on the detection of HPAI. In 2010, NAQS surveillance activities tested more than 1000 samples collected from wild waterfowl, including faecal samples taken from the environment where birds have been present (i.e. environmental sampling), and domestic poultry in the Torres Strait. In addition to specific targeted surveys, NAQS encourages Indigenous communities and other stakeholders to report significant mortality events in wild birds.

A core focus for NAQS in 2010 was improving collaboration with key stakeholder groups such as AHA and state and territory agricultural agencies, with the aims of:

- ensuring that surveillance priorities align with national biosecurity objectives, including monitoring programs for arboviruses and screw-worm fly
- providing strategic input into national information management and networking initiatives, including the Australian Biosecurity and Intelligence Network, and the Biosecurity, Surveillance, Incident Response and Tracing program (BioSIRT).

### Onshore surveillance

Animal health surveys for the early detection of NAQS target pests and diseases<sup>49</sup> in domestic and wild animals were conducted across coastal northern Australia on a risk-based schedule. Targeted pests and diseases of concern to the program include HPAI, surra, screw-worm fly, foot-and-mouth disease and classical swine fever.

The NAQS program of targeted animal health surveys was complemented by other surveillance activities to improve early detection, including:

- regular testing of sentinel cattle herds in Western Australia, the Northern Territory and Queensland for target diseases (including exotic strains of BTV, which are reported through NAMP); a new sentinel herd was established in the Northern Peninsula area of Cape York during 2010
- wet-season monitoring for Japanese encephalitis virus in a sentinel pig herd in the Northern Peninsula area of Cape York
- trapping and monitoring programs to detect target pests and diseases, including adult screw-worm fly, exotic bees and bee parasites, and insect vectors of animal disease (including *Culicoides* species)
- targeted public awareness and extension activities among stakeholder groups in northern Australia to encourage reporting by the community of suspect

pest, weed and disease threats — this is largely achieved through the Quarantine Top Watch! awareness campaign.

No targeted exotic pests or diseases were detected by NAQS activities in 2010.

### 3.6.2 Animal biosecurity in the north Queensland tropics

Biosecurity Queensland conducts surveillance and awareness activities for emergency pests and diseases across tropical north Queensland. These activities complement those of other programs, such as border security and quarantine barrier activities undertaken by AQIS and NAQS. They also contribute to national pest and disease surveillance programs, including:

- NAMP
- the NTSESP
- EAD preparedness
- apiary surveillance
- peri-urban biosecurity
- livestock identification and traceability
- screw-worm fly surveillance
- aquatic animal health surveillance.

Biosecurity Queensland personnel aim to raise awareness about biosecurity. They provide training to government and nongovernment personnel in:

- managing zoonotic disease
- promoting animal welfare and animal ethics
- managing emergency pest and disease incidents
- decontamination, movement controls and sample collection
- identifying and reporting suspect animal pests or diseases
- animal disease prevention strategies, including swill-feeding regulations.

A key activity for Biosecurity Queensland is to investigate reported outbreaks of disease and losses in livestock and domestic animals. During 2010, north Queensland cases involving suspected EADs included several avian influenza and Newcastle disease exclusions in domestic poultry, and brucellosis exclusion in backyard domestic pigs. All cases proved negative.

Biosecurity Queensland expanded its response activities in and surrounding the Cairns district against an incursion of the Asian honey bee, *Apis cerana* (originally detected in May 2007). The response has included using a sniffer dog trained in bee detection.

49 [www.daff.gov.au/aqis/quarantine/naqs/target-lists](http://www.daff.gov.au/aqis/quarantine/naqs/target-lists)

Through surveillance activities and public awareness campaigns, 334 nests and swarms have been detected and destroyed since the original incursion. Of these, 276 nests and swarms were destroyed in 2010. Chapter 4 provides further information on this incursion.

Investigations have continued into the deaths of wild javelin grouper (*Pomadasys kaakan*) in north Queensland coastal waters. The causal organism was identified as *Streptococcus agalactiae* in 2009, and a three-year project funded by Biosecurity Queensland, the University of Queensland and the Fisheries Research and Development Corporation has recently been approved. The project will investigate bacterial spread between fish, examine the impact of *S. agalactiae* on farmed fish species and develop diagnostic tests for disease caused by this bacterium.

Educational programs conducted in the northern tropics during 2010 included:

- providing awareness and promotional information to backyard poultry owners, as part of a survey of owner husbandry practices and biosecurity knowledge
- educating equine veterinary practitioners in the use of Hendra virus practice kits and personal protective equipment
- presentations at the Cape York Peninsula and Torres Strait training workshops for environmental health workers and animal management workers to stress the importance of biosecurity awareness, animal welfare legislation and zoonotic disease exposure for Indigenous communities.

### 3.6.3 Japanese encephalitis surveillance

NAQS undertakes surveillance for transmission of Japanese encephalitis in the Torres Strait and mainland Australia. Testing of a sentinel pig herd and annual serological surveys of domestic pigs and horses in the communities in the Northern Peninsula area, on the Cape York Peninsula in Queensland, have shown no serological evidence of transmission of the virus on the mainland since early 2004. Serological testing of samples collected from domestic pigs during a survey of the Torres Strait in 2010 indicated exposure to Japanese encephalitis. This result is not unusual — evidence of exposure to Japanese encephalitis in the Torres Strait has frequently been found in annual NAQS surveys since the mid-1990s. AQIS continues to provide biological samples from its surveillance activities to Queensland Health, and to liaise with Queensland Health regarding surveillance results and response measures associated with Japanese encephalitis in the region.

## 3.7 Public health surveillance for zoonotic diseases

The Communicable Diseases Network Australia (see Chapter 7) provides national leadership and coordination for the surveillance, prevention and control of communicable human diseases that pose a threat to public health. Queensland Health coordinated the public health response to the Hendra virus incident at Tewantin (see Chapter 4 for more information on this response).

### 3.7.1 National Notifiable Diseases Surveillance System

The National Notifiable Diseases Surveillance System (NNDSS) coordinates the national surveillance of more than 50 communicable diseases or disease groups that can affect people. Unit records of disease notifications made to state or territory health authorities, under the provisions of the public health legislation in each jurisdiction, are supplied daily to the Office of Health Protection, Australian Government Department of Health and Ageing. The data are published weekly on the NNDSS website<sup>50</sup> and quarterly in the journal *Communicable Diseases Intelligence*. Data on five important zoonoses are replicated in *Animal Health Surveillance Quarterly*.

Table 3.6 reports the incidence of selected zoonotic diseases in 2010 and compares these data with those for 2009 and a five-year mean from 2005–06 to 2009–10.

### 3.7.2 National Enteric Pathogen Surveillance Scheme

The National Enteric Pathogen Surveillance Scheme collects, analyses and disseminates data on enteric pathogens isolated from humans, animals, food, water, the environment and other sources. The scheme is operated and maintained by the Microbiological Diagnostic Unit at the University of Melbourne. Data on pathogens — such as *Salmonella* spp., pathogenic *Escherichia coli*, *Yersinia* spp. and *Campylobacter* spp. — isolated from humans and nonhuman sources are submitted from participating laboratories around Australia. Data for human notifications are reported within the NNDSS.

NNDSS data show that, as in recent years, the most frequently reported foodborne infections in 2010 were campylobacteriosis<sup>51</sup> (16 978 cases) and salmonellosis (11 915 cases).

50 [www.health.gov.au/internet/main/publishing.nsf/Content/cda-surveil-nndss-nndssintro.htm](http://www.health.gov.au/internet/main/publishing.nsf/Content/cda-surveil-nndss-nndssintro.htm)

51 This disease is not notifiable in New South Wales.

**Table 3.6 Incidence of selected zoonotic diseases, 2010**

Zoonotic disease	Number of cases <sup>a</sup>		
	2009	2010	5-year mean
Anthrax	0	1	0.4
Barmah Forest virus infection	1481	1459	1745.4
Brucellosis <sup>b</sup>	31	22	41.6
Kunjin virus infection	2	2	1.6
Leptospirosis	147	126	128.2
Murray Valley encephalitis virus infection	4	0	1.8
Ornithosis	65	53	117.8
Q fever <sup>c</sup>	310	305	379.6
Ross River virus infection	4794	5079	4539.8

**a** Data accessed on 11 February 2011 by diagnosis date.

**b** Australia is free from zoonotic *Brucella* spp. except *Brucella suis*, which is endemic in feral pigs in some areas.

**c** The Australian Q Fever Register stores information on the Q fever immune status of individuals. The website [www.qfever.org](http://www.qfever.org) has general information on Q fever and information on the register.