ANIMAL HEALTH SURVEILLANCE

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PREFACE

In this edition of *Animal Health Surveillance Quarterly* (AHSQ), there is a review of the Australian Veterinary Practioners' Surveillance Network (AVPSN). This initiative gathers information on farm visits by nongovernment veterinarians and will enhance both our surveillance activities for new and emerging disease syndromes and the monitoring of endemic diseases. One hundred practices from around Australia will participate in the program and provide details of their farm visits to a central facility. This is a new and exciting initiative that begins to harness the power of the private veterinary practioner network to support and enhance the more formal government-based surveillance activities.

At the General Session of the World Organisation for Animal Health (OIE) held in May 2007, one of the technical items presented was 'The use of epidemiological models for the management of animal diseases'. The topic was well received, and collaborating centres for modelling may be established in the future under the auspices of the OIE. This is particularly pleasing for Australia because we are at the forefront of this field through the work conducted within the Office of the Chief Veterinary Officer by a team lead by Dr Graeme Garner. This group has been extremely active in the field, participating in the international EpiTeam subgroup of the Quadrilateral Group of countries' Emergency Management Group. The EpiTeam examines and develops various forms of epidemiological decision-support tools, including modelling for the management of the response to emergency animal diseases. The development of models allows testing of the efficacy of various intervention strategies in disease control before an outbreak occurs. Recognition of the value of this work by the OIE is pleasing indeed.

Other topics in this edition include highlights of disease surveillance activities, items of interest from States and Territories, and summaries of disease monitoring and surveillance programs reported to Australia's National Animal Health Information System (NAHIS). Only summary information is recorded in NAHIS; detailed data are maintained by the source organisations.

The information in AHSQ is accurate at the time of publication, but minor discrepancies may occur because of the short reporting and production time. AHSQ is also available on the Animal Health Australia website (http://www.animalhealthaustralia.com.au/status/nahis.cfm).

Bob Biddle, Acting Australian Chief Veterinary Officer

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AUSVETPLAN update

AUSVETPLAN is a series of management manuals that provide essential information, guidance and policy to combat an emergency animal disease incident in Australia. AUSVETPLAN consists of 52 individual manuals, comprising:

- 30 strategies for individual diseases
- five operational procedures manuals
- nine manuals for specific animal enterprises
- three management manuals
- two resource documents
- a wild animal response strategy
- the Animal Emergency Management Information System (ANEMIS)
- a summary document that describes the general content of the manuals and their development and approval process.

Before new or revised documents are submitted to the Animal Health Committee (AHC) for endorsement, the Technical Review Group (TRG) provides a final technical review.

The new operational procedures manual, *Livestock Welfare and Management*, was published in March 2007. Final endorsement by the Primary Industries Ministerial Council of the revised *Equine Influenza* manual is imminent. Manuals recently published are *Screw-worm Fly*, *Control Centres Management* (Parts 1 and 2) and *Disposal Procedures*. An updated version of the *Foot-and-Mouth Disease* manual has also been published. *Very Virulent Infectious Bursal Disease* and *Meat Processing* are being revised by the AHC. The AHC has approved changes to avian influenza response policies, and these have been included in an updated version of the *Avian Influenza* manual on the Animal Health Australia website.[1] Vaccination options for avian influenza are being considered by the AHC and will be included in the manual when they have been approved.

In March 2007, the TRG reviewed another 12 manuals, including the extensively revised *Public Relations* manual, which will be submitted shortly to the AHC for endorsement. It has been published as an interim document until its endorsement. Other revised manuals that will be republished by 31 December 2007 include:

- *Artificial Breeding Centres*
- *Aujeszky's Disease*
- *Foot-and-Mouth Disease*
- *Response Policy Brief for West Nile Virus*
- *Scrapie*
- *Sheep Pox and Goat Pox*
- *Saleyards and Transport*
- *Bluetongue*
- *Avian Influenza*
- *Australian Bat Lyssavirus*
- *Decontamination Procedures*
- *Summary Document*.

Manuals are given priority for updating based on the level of urgency associated with the perceived disease risk, the amount of editing and rewriting that is required, and the currency of the information in the published version of the manual.

The TRG has also examined the structure of the disease strategy manuals and will propose to the AHC that their format is modified. The new format will ensure that the manuals are suitable for effective use in a disease response and in preparatory training. The manual for swine vesicular disease, which is currently being reviewed, will be presented for endorsement in the revised format.

Animal Health Australia is planning to address a number of issues relating to the efficiency of updating and accessing information in the manuals, particularly where content is common to more than one manual. For example, in the event of a virulent Newcastle disease incident, there will be a need to access information in several documents, including the disease strategy manual, the decontamination manual and the livestock welfare manual.

The most recent edition of each manual is the version available on the Animal Health Australia website (see Table 1 below).

Table 1 AUSVETPLAN manuals currently on the Animal Health Australia website

Manual	Release date	Version
Summary Document	2002	Edition 3, version 3.0, 2002
Disease strategies		
African Horse Sickness	1996	Edition 2, version 2.0, 1996
African Swine Fever	1996	Edition 2, version 2.0, 1996
Anthrax	15 August 2006	Edition 3, version 3.2, 2005
Aujeszky's Disease	1996	Edition 2, version 2.0, 1996
Australian Bat Lyssavirus	1999	Edition 2, version 2.1, 1999
Avian Influenza	3 August 2007	Edition 3, version 3.1, 2006[a]
Bee Diseases and Pests	15 August 2006	Edition 3, version 3.0, 2006
Bluetongue	1996	Edition 2, version 2.0, 1996
Bovine Brucellosis	15 August 2006	Edition 3, version 3.0, 2005
Bovine Spongiform Encephalopathy	11 October 2006	Edition 3, version 3.1, 2005
Classical Swine Fever	1996	Edition 2, version 2.0, 1996
Contagious Equine Metritis	2002	Edition 3, version 3.0, 2002
Equine Influenza	1996	Edition 2, version 2.0, 1996
Foot-and-Mouth Disease	2002	Edition 3, version 3.1, 2006[a]
Japanese Encephalitis	1998	Edition 2, version 2.0, 1998
Lumpy Skin Disease	1996	Edition 2, version 2.0, 1996
Newcastle Disease	11 December 2006	Edition 3, version 3.1, 2006
Peste des Petits Ruminants	1996	Edition 2, version 2.0, 1996
Porcine Reproductive and Respiratory Syndrome (PRRS)	15 August 2006	Edition 3, version 3.0, 2006
Rabies	1996	Edition 2, version 2.0, 1996
Rift Valley Fever	1996	Edition 2, version 2.0, 1996
Rinderpest	1996	Edition 2, version 2.0, 1996
Scrapie	1998	Edition 2, version 2.1, 1998
Screw-worm Fly	1 May 2007	Edition 3, version 3.0, 2007
Sheep and Goat Pox	1996	Edition 2, version 2.0, 1996
Surra	11 September 2006	Edition 3, version 3.0, 2006
Swine Vesicular Disease	1996	Edition 2, version 2.0, 1996
Transmissible Gastronenteritis	1996	Edition 2, version 2.0, 1996
Vesicular Exanthema	1996	Edition 2, version 2.0, 1996
Vesicular Stomatitis	1996	Edition 2, version 2.0, 1996
Operational manuals		
Decontamination	2000	Edition 2, version 2.1, 2000
Destruction of Animals	11 September 2006	Edition 3, version 3.0, 2006
Disposal Procedures	1 May 2007	Edition 3, version 3.0, 2007
Livestock Welfare and Management	13 March 2007	Edition 3, version 3.0, 2007
Public Relations	30 April 2007	Edition 3, version 3.0, 2007[b]
Valuation and Compensation	2006	Edition 3, version 3.0, 2006
Enterprise manuals		
Artificial Breeding Centres	17 September 1999	Edition 2, version 2.1, 1999
Feedlots	1998	Edition 2, version 2.1, 1998

Manual	Release date	Version
Enterprise manuals (contd)		
Meat Processing	1998	Edition 2, version 2.1, 1998
Poultry Industry	1996	Edition 2, version 2.0, 1996
Saleyards and Transport	1999	Edition 2, version 2.1, 1999
Veterinary Practices	1996	Edition 2, version 2.0, 1996
Zoos	1998	Edition 2, version 2.1, 1998
Management manuals		
Control Centres Management Manual Part 1	1 May 2007	Edition 3, version 3.0, 2007
Control Centres Management Manual Part 2	1 May 2007	Edition 3, version 3.0, 2007
Laboratory Preparedness	1996	Edition 2, version 2.0, 1996
Resource manual		
Response Policy Brief	11 September 2006	Edition 3, version 3.0, 2006
EAD information system		
ANEMIS	December 2004	August 2004[a]
Wild animal		
Wild Animal Response Strategy	2005	Edition 3, version 3.2, 2005

ANEMIS = Animal Emergency Management Information System; EAD = emergency animal disease
a Interim draft
b Awaiting final endorsement

Many of the manuals are in review at the moment and we hope to have all manuals dated 1996 and 1998 updated by 30 June 2008.

Users of the manual should resist the temptation to have 'hard copies' in their bookcases, because some of the manuals (e.g. those for foot-and-mouth disease and avian influenza) are updated regularly to accommodate developments in technology and policy.

Contributed by: Ian Denney, Animal Health Australia

[1] http://www.animalhealthaustralia.com.au

World Organisation for Animal Health — General Session

The 75th General Session of the World Organisation for Animal Health (OIE) was held in Paris on 20–25 May 2007. Participants attended from 156 of the 168 Member Countries of the OIE, as well as from intergovernmental organisations — such as the United Nations Food and Agriculture Organization (FAO) and the World Health Organization (WHO) — and from nongovernmental organisations, including the World Veterinary Association and the International Equestrian Federation.

As well as Australia's Delegate to the OIE (Dr Gardner Murray) and the acting Chief Veterinary Officer (Dr Bob Biddle), the Australian delegation this year included representatives of the Australian Veterinary Association, Animal Health Australia's Industry Forum and the university sector. This nongovernment participation indicates the increasing interest in OIE affairs that Australian stakeholders have been showing in recent years.

A significant development was adoption of a resolution intended to allow both the People's Republic of China and Taipei China to actively participate in OIE activities. Another key resolution was the awarding of bovine spongiform encephalopathy (BSE) negligible risk status to Australia, New Zealand, Uruguay, Argentina and Singapore.

A resolution was adopted giving in-principle support for 'the development of a Universal Declaration on Animal Welfare which calls on countries to acknowledge the importance of animal welfare and, at the same time, recognises the OIE as the established international animal welfare standard-setting body'.

A list of veterinary critically important antimicrobials was adopted, not as an OIE standard, but as an aid to the work in progress with the WHO, FAO and Codex on antimicrobial resistance.

As is the case every year, new chapters were adopted for both the *Terrestrial Animal Health Code* and the *Aquatic Animal Health Code*.

The two technical items this year were 'The use of epidemiological models for the management of animal diseases' and 'The role of Reference Laboratories and Collaborating Centres in providing permanent support for the objectives and mandates of the OIE'. OIE will consider developing guidelines for epidemiological models, establishing Collaborating Centres on modelling, and publishing a special edition of the OIE *Scientific and Technical Review* on the application of modelling.

Technical items for future General Sessions were decided. These include 'Integrating small farmers in animal health programs' and 'Impact of climate change and environmental changes on emerging and re-emerging animal disease and animal production'.

Contributed by: Jill Mortier, Office of the Chief Veterinary Officer, Australian Government Department of Agriculture, Fisheries and Forestry

Australian Veterinary Practitioners Surveillance Network report

The Australian Veterinary Practitioners Surveillance Network (AVPSN) is an initiative of the Australian Government Department of Agriculture, Fisheries and Forestry, in response to the Frawley Review of Rural Veterinary Services undertaken in 2002–03.

The AVPSN collates information that adds to, and complements, information provided by existing surveillance activities. In particular, the AVPSN:

- collects data on the frequency of on-farm investigations by nongovernment veterinarians — organised geographically, by livestock type and by reasons and outcomes for farm visits
- enhances Australia's ability to recognise the emergence of new disease syndromes
- enables the detection of changes in trends for an expanded range of endemic diseases via enhanced farm-based surveillance.

The system will also help to raise the level of awareness of emergency animal diseases among practitioners working in all production areas of Australia.

A small group of practitioners tested a pilot scheme of the AVPSN in 2004–05. The pilot scheme was improved upon and expanded to include 38 veterinary practices around Australia in an initial 3-month implementation phase from February to April 2007. The practices were carefully selected to take in the breadth of Australia's animal industries and livestock production systems. Participating veterinarians were required to record farm visits using a simple web-based program. Data collected included the location of the farm, species of animal and production system, and reason(s) and outcome(s) for the visit.

Feedback from the 3-month implementation phase was received from participating veterinarians at a workshop during the Australian Veterinary Association annual conference in May 2007. Compliance by participants was very good, with only a few practitioners having problems accessing the system.

Plans for the future

The new phase of implementation of the AVPSN will involve 100 practices Australia-wide. Again, care will be taken to ensure that practices are selected to be representative of livestock distributions and production systems. A range of strategies will be used to keep practitioners focused and maintain the quality of data collected.

Importance of AVPSN to Australia's overall animal disease surveillance

The AVPSN will provide broad-based surveillance data for disease syndromes to complement the more specific surveillance programs that focus on individual diseases. The anticipated outcomes will add strength to Australia's disease-free reputation and further enhance Australia's trade position. It is intended that the AVPSN, when fully implemented, will report directly to the National Animal Health Information System (NAHIS).

Epidemiological mapping will again be used when selecting practices to expand the AVPSN. This willensure that the information collected is as representative as possible of veterinary consultations for production animals Australia-wide.

The AVPSN will potentially provide hundreds of thousands of pieces of baseline data. In addition to routine reporting to NAHIS and providing some measurement of trends and emergence of new disease syndromes, the program will act as a source of historical data for retrospective studies of disease syndromes that may become significant in the future.

Contributed by: Jane Parker, Australian Government Department of Agriculture, Fisheries and Forestry

National Arbovirus Monitoring Program

The Australian National Arbovirus Monitoring Program (NAMP) is an integrated national program that is jointly funded by industry and governments. The program monitors the distribution of economically important insect-borne viruses (e.g. bluetongue, Akabane and bovine ephemeral fever) and their vectors. This report covers the first half of 2007, when arboviral activity in northern Australia is expected.

Generally, there was a reduced level of vector activity and seroconversions in traditional arbovirus areas of Australia. During this period, rainfall in the northern half of Western Australia (WA) was below average, except for heavy rainfall in the central north associated with a cyclone. There was a very late start to the wet season in the Northern Territory (NT), with no significant rainfall until March. Very heavy rainfall and flooding occurred in most northern regions during March. Unseasonable rainfall, associated with cold conditions, occurred in the Katherine, Victoria River and Barkly areas during June. In Queensland (Qld), there was a good wet season, with rainfall above average in the north (down to 20^{o}S latitude). In the south of the State, most areas did receive some rain, but only 100–200 mm over the first 3 months of the year. April and May were warm and dry, but June was cloudy and wet in central and eastern areas, with record-low daytime temperatures. More than 90% of New South Wales (NSW) continued to be drought affected at the start of the year. Above-average rainfall fell on the south and central coasts in February and in the north-west in March, and this was followed by much higher than average rainfall in the north-west in May and on the coastal and tableland regions in June. At the start of winter, the drought-affected area had decreased to 70% of the State.

Neither vector activity nor seroconversions to bluetongue, Akabane or bovine ephemeral fever viruses were detected in the southern states of Victoria, Tasmania or South Australia during the first half of 2007.

Bluetongue virus

In WA, bluetongue virus seroconversion was detected in two herds in the north of the Kimberley, both in a known infected area.

In the NT, bluetongue virus activity was very late. Seroconversions were detected at Beatrice Hill, Berrimah and Douglas Daly in May, and at Katherine and Victoria River in June 2007. These are all within the bluetongue endemic area.

In Qld, bluetongue virus activity was detected in only four sentinel herds during January–June 2007. In the north, seroconversions occurred at Normanton and Townsville and were spread over the whole period. The Townsville herd, which is bled monthly, showed two peaks of infection, one in December–February

and a second in May–June. In addition, four animals seroconverted at Taroom and one at Warwick in the south-east of the State in May 2007.

In NSW, bluetongue virus seroconversions were recorded between February and June 2007 at Lismore, Casino, Coffs Harbour and Kempsey on the north coast, Coolatai on the northern slopes, Yarrowitch in the Armidale Rural Lands Protection Board area of the northern tablelands and Singleton in the Hunter Valley.

Akabane virus

In WA, Akabane seroconversion was detected over a wider area of the Kimberley than for bluetongue, including herds as far south as Halls Creek and Broome.

In the NT, Akabane activity was very limited. Seroconversions were detected at Katherine in February and April 2007. A single seroconversion occured at Beatrice Hill, near Darwin, in May.

In Qld, very few Akabane infections were detected during January–June 2007. Only two herds had seroconversions: one at Normanton in the central north and the other at Chinchilla in the south.

In NSW, Akabane seroconversions were first detected in December 2006 and continued until July 2007. Transmission extended along the coastal plain south to Camden and was also recorded on the northern tablelands and slopes, and in the Armidale region. Cases of Akabane virus-affected calves have been reported on the northern tablelands.

Bovine ephemeral fever virus

In WA, seroconversion to bovine ephemeral fever (BEF) was detected in a herd south-west of Fitzroy Crossing in the Kimberley.

In the NT, BEF activity was widespread, with seroconversions in the four most northerly herds in most months. Numerous clinical cases were reported.

In Qld, BEF seroconversions were detected in eight sentinel herds during January–June 2007, with most being in the second quarter (April–June). These were spread fairly widely over the State and extended as far west as Cunnamulla and Cloncurry. Laboratory-confirmed clinical cases, however, mainly occurred in the south and in the first quarter of the year.

In NSW, BEF seroconversions have been recorded in coastal herds as far south as Kempsey and also at Bourke. Cases of ephemeral fever have been reported in the north-west of the State.

Insect trapping

In WA, vectors were trapped only in the north of the Kimberley, but were collected in greater numbers and diversity than in previous recent years. This, in part, has been due to the improvement in the types of vector light traps used. *Culicoides brevitarsis* was collected at Kalumburu and Kununurra. *C. actoni*, *C. fulvus* and *C. wadai* were collected at Kalumburu.

In the NT, *C. brevitarsis* was found at all the northerly sites in most months. *C. actoni* was found at Beatrice Hill, Victoria River and Katherine in January and February 2007. *C. fulvus* and *C. wadai* were found only at the four most northerly sites in most months.

In NSW, Nowra recorded low numbers of *C. brevitarsis* in March and was the southern extent of its distribution. Movement of the vector up the Hunter Valley was limited and slower than last year. *C. brevitarsis* was recorded at Denman in April and May 2007. In Scone, *C. brevitarsis* was recorded in March and persisted until May. *C. brevitarsis* activity persisted until May at most sites because of the mild conditions. *C. wadai* was recorded at Lismore in April and May 2007.

In Qld, two vector species were collected in the period, both within previously recorded distributions. *C. actoni* was collected at Townsville. *C. brevitarsis* was collected over a wide area from the east and Gulf coasts to as far inland as Dajarra (south of Mt Isa) in the north and St George in the south; however, the inland populations appeared to be relatively sparse.

Additional information can be found at Animal Health Australia's website.[2]

Contributed by: NAMP coordination commmittee

[2] http://www.animalhealthaustralia.com.au/programs/adsp/namp/namp_home.cfm

Aquatic Animal Health

OIE General Session, May 2007

At the 75th General Session of the World Organisation for Animal Health (OIE), held in Paris on 20–25 May 2007, changes to the *Aquatic Animal Health Code* (the Aquatic Code), the *Manual of Diagnostic Tests for Aquatic Animals* (the Aquatic Manual) and the scope of the OIE were adopted.

In the Aquatic Code, two crustacean diseases — infectious myonecrosis (IMN) and white tail disease (WTD) — were added to the diseases listed by the OIE. Formal reporting obligations for IMN and WTD begin on 1 January 2008 for OIE Member Countries. Both these diseases are exotic to Australia. The OIE International Committee also agreed to place the crustacean diseases hepatopancreatic parvovirus disease (HPVD) and Mourilyan virus disease (MoVD) under study for listing.

Further changes to the Aquatic Code included the adoption of a new chapter on the finfish disease, koi herpesvirus disease (KHVD), and the revision of chapters for six mollusc diseases and six crustacean diseases. The OIE International Committee also adopted revised Aquatic Code chapters on zoning and compartmentalisation, and recommendations for transport.

Updates to the Aquatic Manual included a new chapter for diagnosis of KHVD. This disease has never been reported from Australia. The current versions of the Aquatic Code and the Aquatic Manual can be downloaded, free of charge, from the OIE website.[3]

In addition to the changes adopted for the Aquatic Code and Aquatic Manual, the International Committee agreed, in principle, that the OIE should expand its scope to include amphibian diseases. The OIE will now reconvene its ad hoc group on amphibian diseases, with revised terms of reference, which include the development of a list of diseases and draft chapters for the Aquatic Code and the Aquatic Manual.

AQUAPLAN 2005–2010 review

The progress and priorities of AQUAPLAN 2005–2010, Australia's National Strategic Plan for Aquatic Animal Health, were recently reviewed by stakeholders, including representatives from industry, academia and the Australian and State and Territory governments. Stakeholders were asked to provide updates on the progress of AQUAPLAN projects in which they were directly or indirectly involved and priority ratings for each project. The Aquatic Animal Health Committee, which has oversight of AQUAPLAN 2005–2010, considered stakeholder responses at its meeting in Brisbane on 3 July 2007, and agreed on revised priority ratings for individual AQUAPLAN projects.

Contributed by: Ingo Ernst, Office of the Chief Veterinary Officer, Australian Government Department of Agriculture, Fisheries and Forestry

[3] http://www.oie.int/eng/publicat/en_normes.htm?e1d11

Australian Wildlife Health Network

Avian influenza

Avian influenza virus was excluded as a cause of 23 wild bird mortality events in Australia between April and June 2007. During the period July 2005 to March 2007, no highly pathogenic avian influenza viruses were identified, but a wide range of low pathogenic types were identified. The State reports contain further information. The level of avian influenza viruses in Australian wild birds is low, although sampling has detected a range of low pathogenic virus subtypes.

Mass or unexpected mortalities, and morbidities of unknown causes

Thirty-six mortality events involving birds were reported to the network this quarter. Diagnoses included organophosphate intoxication, calcium and magnesium deficiency, haemorrhagic enteritis, rodenticide poisoning, grain engorgement, botulism, and trauma.

Incidents of relevance to human health

Flying fox mortalities were reported at multiple locations in coastal northern Queensland in June 2007. Australian bat lyssavirus has been excluded as the cause of death. The unseasonally cold weather and lack of food may have been responsible for the deaths, as the majority of animals were juvenile and recently weaned black flying foxes (*Pteropus alecto*) born out of season.

In Esperance, Western Australia, the cause of deaths of lorikeets has been confirmed as lead poisoning (see AHSQ Vol. 11 No. 4 p. 6, and Vol. 12 No. 1 p.7).

The network is interested in receiving reports of wildlife incidents and definitive diagnoses of causes of death in wildlife in Australia. The information in this report is based on that submitted by network subscribers and network State and Territory coordinators. The network would like to thank all those who submitted information for this report. For copies of the network newsletter or digests, please contact Rupert Woods at rwoods@zoo.nsw.gov.au.

Contributed by: Chris Bunn, Office of the Chief Veterinary Officer, Australian Government Department of Agriculture, Fisheries and Forestry; Leesa Haynes, Projects Coordinator, Australian Wildlife Health Network; and Janelle Ward, Australian Wildlife Health Network

State and Territory reports

In Australia, the States and Territories are responsible for animal disease control within their borders. National animal health programs are developed through consultation at Animal Health Committee and are managed by Animal Health Australia.

New South Wales

Contributed by: Rory Arthur, Department of Primary Industries

Exclusion of canine influenza

Canine influenza was excluded as a cause of an acute outbreak of respiratory disease and pneumonia in a greyhound facility near Sydney.

Eighty of 200 greyhounds showed mild to severe coughing. Three developed severe respiratory signs over a 12-hour period and subsequently died of fibrino-haemorrhagic bacterial bronchopneumonia. *Streptococcus equi* subsp. *zooepidemicus* was cultured from the lung of one dog. Since this bacterium has been closely associated with canine influenza outbreaks in greyhounds in the United States, a sample of lung tissue from one dog, and nasal and blood samples from 19 affected cohorts, were examined at the Elizabeth Macarthur Agricultural Institute and the Australian Animal Health Laboratory for influenza A virus. No virus was detected.

Neurological disease in pigs

Severe nutritional deficiencies caused unusual nervous signs in porkers from southern New South Wales.

Approximately 160 pigs were affected. Many of the pigs were ataxic and unable to walk. Some exhibited apparent blindness, reluctance to stand, dog sitting, poor balance and convulsions. Necropsy findings were normal, and no viruses or bacteria were isolated from tissue samples. Histology showed moderate encephalomalacia. An absence of cerebral eosinophilia ruled out salt poisoning, and blood chemistry ruled out arsenic and lead poisoning. Tests on the feed showed a complete absence of vitamin A, and on-farm investigations revealed that nutritional premixes had been left out of the feed. The feed balance was corrected, and injections of multivitamins in remaining pigs on the piggery led to clinical improvement.

Congenital biliary atresia and jaundice in lambs

Approximately 50 lambs died and 20–30 lambs were sick, from a mob of 550 lambing ewes, in an unusual case of plant poisoning on a property adjacent to the Hume Weir in southern New South Wales.

Pregnant cross-bred ewes had closely grazed previously water-covered river flats. *Dysphania glomulifera* subsp. *glomulifera* was a significant component of the vegetation. Problems arose 1–2 weeks after the lambs were born. They were very light in body condition, and had a white scour and jaundiced conjunctivas. Gross pathology confirmed severe jaundice. The liver was yellow ochre in colour; the gall bladder was small and shrunken; the kidneys were khaki coloured (urine positive for bilirubin); and the spleen was enlarged. Undigested milk in the stomach and intestines was evidence that the lambs had been suckling.

Congenital aplasia of bile ducts was suspected and confirmed by histopathology. This condition has been rarely associated with consumption of *Dysphania glomulifera* during gestation.

Hendra virus exclusion

Hendra virus was excluded as the cause of respiratory distress in a 5-year-old pony at Kempsey. The pony was very depressed and had a mild nasal discharge. Flying foxes roosted in trees in the paddock in which it was kept. The pony was treated for pneumonia for a number of days but died.

Samples forwarded to the Australian Animal Health Laboratory excluded Hendra virus as the cause.

Foot-and-mouth disease exclusion in a dairy cow

Private and government veterinarians collaborated in investigating a case of suspected bovine papular stomatitis on the north coast of New South Wales.

One dairy-cross heifer in poor body condition was recumbent, and the private veterinarian found erosive lesions on the mouth and nose. No lesions were seen around the feet. Rectal temperature was normal. Similar lesions were seen in a herd mate, but no other animals in contact were affected. Feed on the property was very poor and parasite control minimal. Histopathology and electron microscopy confirmed a diagnosis of bovine papular stomatitis. Samples of the lesions were submitted to the Australian Animal Health Laboratory for foot-and-mouth disease and vesicular stomatitis; results were negative.

Avian influenza and Newcastle disease exclusion

Bacterial septicaemia caused reduced egg production, depression, diarrhoea and a small increase in mortalities in hens on a free-range egg farm on the north coast of New South Wales. Because of the coastal location and exposure to free-flying birds, samples were taken to test for exotic strains of avian influenza and Newcastle disease viruses. Results were negative. Necropsy of two depressed hens showed no significant lesions, and histological examination revealed multifocal hepatic necrosis. The hens were treated with antibiotics, and the problem resolved.

Campylobacter fetus subsp. *fetus* abortions in cattle

Surveillance in New South Wales' semi-arid zone detected a cattle reproductive disorder with abortions on a property west of Nyngan.

Several abortions per year have occurred in various mobs of cows and heifers on the property. An aborted foetus was sent for laboratory necropsy, and a blood sample was collected from the dam; the dam of another aborted foetus and five heifers that had not aborted.

Leptospirosis and *Neospora* infection were excluded by serology. *Campylobacter fetus* subsp. *fetus* was isolated from the stomach of the aborted foetus. *C. fetus* subsp. *venerealis* is more common.

The cause of the disorder has yet to be fully resolved. Bovine abortions caused by *C. fetus* subsp. *fetus* occur sporadically, and it is unclear at this stage whether the other abortions that have occurred on the property are due to the same agent.

Tetanus in lambs

Tetanus was diagnosed on clinical findings as the cause of death over a 5-day period of seven lambs, aged approximately 4 months, out of 600 at risk on a property near Barmedman. The deaths started 3 weeks after mulesing, tail docking, ear marking and the application of castration rings. In previous years, the normal practice was to perform these procedures on animals 6–8 weeks of age, combined with six-in-one vaccination. This year, the animals were older and were not vaccinated.

Nitrate poisoning

Nitrate poisoning caused the death of 18 out of 250 merino ewes on a grazing property near Trundle. The sheep were aged 2–5 years and were 6 weeks from lambing. Nitrate at 100 ppm was detected in aqueous humour from a recently dead sheep. The sheep had been fed a high-grain diet for the previous few months. They were then held overnight off feed and scanned the next day for pregnancy. After scanning, the mob was placed onto roadside pasture for 5 hours. The grass species at the roadside were barley grass, ryegrass, couch and wild black oats.

When the sheep were mustered at the end of the day to be returned to their original paddock, the dead animals and 100 sick animals were found. All the sick animals made a complete recovery after being removed from the roadside grazing. It appears that the animals had lost their ability to digest nitrates properly as a result of feeding on grains, which are low in nitrates. Because they were hungry, they engorged on the higher-nitrate grass diet.

Bovine tuberculosis exclusion

Bovine tuberculosis was excluded as the cause of a submandibular swelling in a Brahman cow imported from Alice Springs. An 8-year-old cow presented with a 12-cm firm, submandibular swelling on the right hand side, which had been increasing in size for approximately 1 month. A fine needle aspirate indicated an abscess that released a grey/white liquid pus when lanced. A 1 cm^2 lesion sample was taken for tuberculosis exclusion. The lesion was not

suggestive of tuberculosis on histopathology, but culture revealed a mycobacterial infection. Polymerase chain reaction examination of the culture excluded *Mycobacterium bovis, M. avium* and *M. intracellulare,* and further investigation was unwarranted.

Cattle tick infestations

Cattle tick surveillance in northern New South Wales detected 68 infestations in the past 12 months. This was higher than the 5-year average but fewer than for the 2 previous years. Infestations occurred over a wider geographic area than in the recent past, with detections near Wauchope, Bellingen, and Baryulgil west of Grafton, as well as in the more traditional far North Coast area. These detections demonstrate a very effective disease surveillance system on properties, at saleyards and at abattoirs.

Anthrax

One case of anthrax was diagnosed during the quarter. Three out of 45 animals from a cow–calf herd in Condobolin died over a 1-week period at the beginning of April 2007. The case was managed in accordance with New South Wales Department of Primary Industries anthrax policy. Carcases were disposed of by burning, all animals on the property were vaccinated, and neighbours were notified and advised to vaccinate. The property was placed under quarantine and movement controls, and tracings followed the standard procedures in AUSVETPLAN.

Anthrax was excluded in 13 investigations of mortalities during the quarter. Four of the investigations involved sheep, and one of these four cases was suspected to be due to cyanide toxicity following recent rains. Fuschia bush (*Eremophila maculata*) samples from the affected paddock tested positive for cyanide.

Nine investigations involved cattle. In two of these, aqueous humour samples from affected animals tested positive for nitrates.

Winter dysentery in a dairy herd

A 300-cow pasture-based dairy herd at Dorrigo experienced a widespread outbreak of acute scouring and reduced milk production affecting about half the herd. Many of the animals were depressed, some were recumbent and about six cows died. The herd somatic cell count increased from 120 000 to a peak of 720 000 per mL. The animals had been grazing on an oat crop sown onto an old corn paddock.

Blood and faeces were collected from some clinical cases, and necropsies were carried out on two fresh carcases. The main gross findings were a mild pneumonia and excess fluid, mucus and fibrin in the intestinal tract.

Laboratory cultures were negative for *Salmonella* and *Yersinia*, and the serum was negative for nitrate. A coronavirus was detected on electron microscopic examination of fecal samples from four affected cows.

Outbreaks of explosive diarrhoea in cattle, with high morbidity and low mortality, have been reported in most countries and are commonly called ‘winter dysentery’. Initially, a *Campylobacter* was suspected as the cause, but it is now believed that a coronavirus infection is the initiating agent for this condition.

Vitamin A and E deficiency in cattle

A deficiency of vitamins A and E caused two deaths, and illness in 25% of a group of 80 Poll Hereford steers and heifers of mixed young ages in a large feedlot in central New South Wales.

The cattle were on a mixed-feed ration in self feeders. Neurological signs, which started about 1 month before the first death occurred, included head tilt, circling, dilated pupils not responsive to light, apparent blindness, loss of awareness, and falling when pushed. Some animals not showing neurological signs were fevered, panting and drooling.

No lesions were reported on necropsy. Kidney and blood lead levels were within normal range. Histopathological examination of the brain showed lesions that were confined to the optic tract, and bovine spongiform encephalopathy was excluded.

Vitamin A deficiency causing stenosis of the optic nerve foraminae was suspected. A very low liver vitamin A concentration of 0.5 mg/kg was detected (reference range 5.7–286 mg/kg). The concentration of vitamin E in the liver was also very low (1.59 mg/kg; reference range 9–44 mg/kg).

In feedlots, grain- and silage-based diets without vitamin supplementation contain inadequate amounts of beta carotene and vitamin E to maintain rapidly growing animals, so supplementation is essential.

Northern Territory

Contributed by: Francois Human, Department of Primary Industry, Fisheries and Mines

Nitrate toxicity in a steer

A 10-month-old steer died overnight on a small property in the Darwin rural area without showing any noticeable clinical signs the day before. A necropsy revealed reddening of the oral mucosa and tissues of the neck. The lungs were oedematous and markedly congested, and the trachea and large bronchi contained foamy haemorrhagic fluid. Haemorrhages were present on and around the heart. Histopathology confirmed congestion and haemorrhages in other organs as well. Nitrate toxicity was suspected, but none of the other 11 animals in the paddock were affected. The cattle grazed on pasture and received no supplement. Poisonous plants were not observed. On further testing, elevated nitrate levels were found in serum, urine and aqueous humour samples. After the owner was informed of potential nitrate sources, he found a half-open bag of fertiliser outside the shed that the steer could have had access to.

Cattle affected by adverse weather

A property in the Douglas Daly region lost four cows of lactating age from a group of about 40. Cows were reported to have a stilted gait and were showing respiratory distress. A necropsy on one animal revealed an extensive pleuropneumonia, and bacteriological culture of the lungs isolated *Mannheimia haemolytica*. The cows were in an open paddock and had been exposed to unseasonably cold and wet weather. The owner moved the cows to a more sheltered paddock, and no further losses have occurred.

A significant number of weaner deaths were also reported across the Victoria River District, the Barkly Tableland and the south-western Darwin region during the spell of cold weather. Deaths were probably associated with hypothermia due to below normal temperatures, high winter rainfall and windy weather in areas where little shelter was available. There has also been an increased incidence of coccidiosis in weaners on a number of properties following the cold weather. Some producers have since introduced a supplement containing monensin as a coccidiostat to the weaners.

Respiratory disease in poultry

A poultry keeper from the Darwin rural area lost 15 birds of various ages from a poultry flock of 100 show birds over a 2-week period. The owner noted signs of respiratory distress and noisy breathing. Clinically affected birds mostly died within a day after showing signs of illness. An infection with avian influenza virus was excluded. Death appeared to have been caused by laryngeal obstruction. Histopathology identified the respiratory disease as infectious laryngotracheitis, which is caused by a herpes virus. This disease, to our knowledge, has not been diagnosed previously in the Northern Territory. The source of the infection is unknown, as there was no movement of the poultry or introduction of new stock in the recent past. Because the poultry are kept under free-range conditions, contact with wild birds is a possible explanation.

Queensland

Contributed by: John Cronin, Queensland Department of Primary Industries and Fisheries

Cattle

Bovine ephemeral fever

Bovine ephemeral fever (BEF) was diagnosed on two properties in April 2007. Diagnosis of BEF at this time of year is unusual. A bull aged 3 years in Stanthorpe shire (far southern Queensland) was pyrexic and recumbent. It was positive for BEF virus on polymerase chain reaction (PCR) testing. On a Wambo shire property (mid-Darling Downs), a heifer aged 2 years was recumbent with raised creatine phosphokinase (CPK) levels of

394 international units per litre (IU/L) (normal levels are 10–200 IU/L). It was also positive on PCR testing.

Bovine pestivirus

Bovine pestivirus (bovine viral diarrhoea virus, BVDV) has been active across the Darling Downs. Of the 28 cases diagnosed, 18 were positive by PCR or enzyme-linked immunosorbent assay (ELISA), indicating the presence of viral antigen. Nine showed high herd seropositivity, associated with poor reproductive performance.

BVDV was associated with ill-thrift in calves in Waggamba shire, where six of 100 calves presented with a history of ill-thrift. The attending veterinarian noted some animals with neurological signs and eye lesions. Necropsy samples from three calves were submitted to the Animal Disease Surveillance Laboratory. Two calves had cerebellar hypoplasia; in one, this was accompanied by a severe internal hydrocephalus. Both of these calves also had coccidiosis. The third calf had an acute suppurative folliculitis, with fungal hyphae present in the hair shafts. This animal was BVDV-antigen capture-ELISA positive, indicating that it was a persistent carrier.

Salmonellosis

Salmonella group B was considered to be responsible for the deaths of two 4-month-old heifers out of 400 at risk on a dairy in Ipswich shire in late June 2007. Clinical signs of respiratory distress preceded death. *Salmonella* sp. was cultured from the liver and lung. Tissues were too autolysed for histological examination.

Salmonella sp. was responsible for the deaths of seven out of 50 dairy heifer calves less than 2 weeks old on a property in Cooloola shire in early June 2007. Clinical signs of staggering and recumbency, with both white and blood scour, were observed.

Spinal abscess due to *Salmonella* infection in a calf

A 3-month-old calf on a Jondaryan shire dairy farm showed muscle stiffness. It became recumbent and was unable to rise on its forelimbs. On necropsy, a large amount of free blood was present in the abdomen, but there was no apparent trauma to the abdominal wall, diaphragm, rib cage or pelvis. Sectioning of the spinal cord revealed a large abscess involving the base of the seventh cervical vertebra and the intervertebral disc between the sixth and seventh vertebrae. Histological examination revealed a moderate, chronic leptopachymeningitis with some mild Wallerian degeneration of spinal nerves. There was also a chronic osteomyelitis of the vertebrae associated with the large abscess, and fibrosis of the surrounding tissues. *Salmonella* Dublin was isolated from the abscess.

Bronchopneumonia and pleuropneumonia

Mannheimia haemolytica caused respiratory infection and sickness in five steers and death in one steer out of a group of nine steers aged 10 months in Tara shire. Signs included laboured breathing, panting, recumbency, depression, and nasal and oral discharge. Pleuropneumonia with excess pleural effusion was seen on necropsy. Histopathology showed lung congestion and oedema, and the alveoli and bronchioles contained neutrophilic exudate. *M. haemolytica* was isolated from lung and pleural fluid.

Nitrate–nitrite poisonings from conserved feeds

The current dry seasonal conditions being experienced across Queensland predispose to increased nitrate concentrations in crops and pastures harvested for livestock feed. Nitrate–nitrite poisoning caused the sudden deaths of two cows out of 44 being fed forage sorghum hay on a property in Kilkivan shire in mid-May 2007. Aqueous humour contained nitrate at 22.0 mg/L (above the normal level of <10 mg/L). Hay that was tested contained 2.4% potassium nitrate on a dry-matter basis.

Nitrate–nitrite poisoning caused the sudden deaths of seven cattle out of 70 at risk in a temporary pen at the Gympie saleyards in early June 2007. The mob had been off feed for 24 hours before being offered baled silage. Deaths occurred overnight. Aqueous humour in two sampled animals contained nitrate at 67.0 and 80.0 mg/L. Feed samples tested contained 3.9% and 4.1% potassium nitrate on a dry-matter basis.

A Stanthorpe shire property reported eight dead Aberdeen Angus cows, heifers and steers aged up to 8 years out of 11 cattle that were fed baled hay with a nitrate content of 4.8% potassium nitrate on a dry-matter basis. Aqueous humour contained nitrate at 42.0 mg/L and nitrite at 4.6 mg/L.

Nitrate–nitrite poisoning was suspected as the cause of death of three cows out of 150 at risk on a property in Beaudesert shire in mid-June 2007. *Sorghum* hay being fed to the animals contained 9.1% potassium nitrate on a dry-matter basis in stalks, and 5.3% in leaf. A further sample of sorghum silage from the same property contained 6.1% potassium nitrate in dry matter.

Nitrate–nitrite poisoning was diagnosed in a herd of stud Charolais cows fed a round bale of Rhodes grass (*Chloris gayana*) hay in yards at Moura in late April 2007. The grass had been heavily fertilised (at about four times the normal rate), irrigated and harvested for hay making just after cold, cloudy weather. Thirteen cows died in a group of 110. Aqueous humour nitrate (and nitrite) concentrations in four dead cows were 110 (0.6), 78 (2.2), 113 (1.6) and 105 (0.6) mg/L, respectively. Hay from the same batch assayed by a commercial laboratory contained 5.8–6.1% potassium nitrate in dry matter.

Babesiosis

Babesia bovis protozoa were identified in smears from a home-bred 6-month-old Friesian on the Atherton Tablelands. Clinical signs included fever, depression and weakness.

A Crows Nest shire property had five dead animals and 10 sick animals out of 50 head of 6-year-old cattle. Signs seen were ill-thrift, lethargy and weakness. *B. bovis* protozoa were seen on blood smears.

Up to 40 out of 600 Shorthorn steers were considered to have died of *B. bovis* infection on a property in Burdekin shire. The steers were introduced from a tick-free property and had been treated with fluazuron but were not vaccinated against tick fever.

Anaplasmosis

In a Herberton shire herd of 80 introduced 2-year-old Charolais heifers, at least three died and 10 more displayed signs of ill-thrift, weight loss and alopecia. Sampled animals were anaemic, and both *Anaplasma marginale* and *A. centrale* were identified in blood smears. On another property in Herberton shire, *A. marginale* parasites were found in blood smears from a young Friesian cow that had recently aborted.

Pigs

Salmonellosis

Salmonella Typhimurium was identified as the cause of death of a 6-week-old weaner pig and sickness in another 20 out of 1000 at risk on a piggery in Kingaroy shire in mid-June 2007. Weaners were reported as losing condition 2 weeks after weaning. The necropsied pig had extensive chronic suppurative pleuropneumonia and a severe necrotising colitis. *Salmonella* Typhimurium was cultured from the faeces.

A Pittsworth shire piggery had 80 dead pigs and 600 sick pigs out of 3600 pigs, all aged 9 weeks. *Salmonella* sp. was isolated from scrapings from the colons of five carrier pigs necropsied at the Animal Disease Surveillance Laboratory.

Meningitis

Streptococcus suis infection resulted in one dead piglet and three sick piglets out of 680 piglets aged 1–3 weeks in a Wambo shire piggery. *S. suis* was isolated from the brain and cerebrospinal fluid of two piglets. One 3-week-old piglet had severe suppurative meningitis and a 1-week-old piglet had an acute suppurative bronchopneumonia.

Sheep

Suspected cyanide poisoning

A western Queensland property reported the sudden death of 50 ewes. The animals had been introduced to a new lot of sorghum hay. Necropsy of some animals showed distinctive bright red blood. No other abnormalities were found during necropsy or through laboratory testing. It was suspected that the animals died of cyanide poisoning, although hay samples tested at the laboratory for toxic compounds could not confirm this diagnosis. No further deaths were noted after the hay was removed.

Poultry

Egg peritonitis and helminth infestation

A Wambo shire free-range layer farm reported a 20% death rate in 1200 layers over a 9-month period from September 2006. In June 2007, two live and five dead birds were necropsied at the Toowoomba Animal Disease Surveillance Laboratory. Egg production had declined drastically over the previous 9 months, from 95% laying to 25%, and up to

10 birds were dying daily. Deaths were considered to be due to multiple causes, including helminth infestation by *Ascaris* sp., egg peritonitis (nonhaemolytic *Escherichia coli* was isolated), and cannibalism by companion birds.

Botulism

Clostridium botulinum toxin was detected in the small intestine of one of 18 backyard chickens that were found dead in Cardwell shire. Mortalities exceeded 50% of the total flock, with 18 deaths and six sick birds out of 30. No toxin source was identified.

Honeybees

Asian honeybee incursion

Asian honeybees (*Apis cerana* — exotic to mainland Australia) were detected in Cairns in May 2007. The first hive was found in the mast of a yacht in a Cairns drydock. This hive was destroyed, and an emergency response was mounted. A further four hives were located and destroyed within the following 4 weeks. All hives were in close proximity to the Cairns waterfront, where ships and barges sail routinely to the Torres Strait and Papua New Guinea.

No exotic mites (*Varroa* spp., *Tropilaelaps* or *Acarapis woodi*) were found on any of the bees or in brood comb examined by entomologists from the Department of Primary Industries and Fisheries and the Commonwealth Scientific and Industrial Research Organisation (CSIRO). The bees were genotyped at CSIRO and were identified as the Java strain of *A. cerana*. This particular strain does not carry *Varroa destructor* mite, which is currently the greatest exotic threat to the Australian honeybee industry.

This is the first recording of an *A. cerana* incursion into Australia involving more than one group of bees. All previous incursions have involved only single nests or swarms. Since the destruction of the fifth hive, no further *A. cerana* have been found. Active surveillance — including sweep netting of flora, pheromone traps, inspections of businesses close to the port and follow-up of suspicious reports from the public — will continue for another 12 months.

South Australia

Contributed by: Celia Dickason, Department of Primary Industries and Resources

Campylobacter abortion in cross-bred ewes

In May 2007, a sheep producer in the upper south-east area reported a high percentage of abortions in his cross-bred ewe flock. The ewes were due to lamb in June, and did not appear unwell.

A freshly aborted fetus was submitted to the laboratory for analysis. Histopathology revealed inflammation of the subepithelial tissue of the placenta, consistent with bacterial placentitis. A low number of gram-negative rods consistent with *Campylobacter* spp. were detected in the placenta. The likely diagnosis of the abortions was campylobacteriosis (caused by *Campylobacter fetus* subsp. *fetus*).

Campylobacter may cause abortion 'storms' in sheep flocks when ewes come into contact with feed or water contaminated with *C. fetus* subsp. *fetus*. Contact with aborted material is also a common cause of infection and spread of the disease. Abortions usually occur in mid to late pregnancy, and abortion rates of 10–50% are common. Outbreaks are most severe when animals are closely confined under conditions that allow for the build-up of a substantial level of infection. In this case, ewes had been kept confined to a small area during the drought and had only recently been let out onto pasture. Abortions ceased after 3–4 weeks.

Listeria meningitis in boer goats

A producer in the Adelaide Hills reported symptoms of weight loss and terminal neurological signs in his Boer goats. Ten goats died out of a herd of 60 animals.

Necropsy results were unremarkable, but histopathology revealed severe multifocal to locally extensive necrosuppurative meningoencephalitis. The brain tested negative for transmissible spongiform encephalopathy. Histopathology showed

lesions consistent with listeriosis, with gram-positive rods demonstrated on special stain. *Listeria monocytogenes* was diagnosed on culture and polymerase chain reaction of the spinal cord. The producer had been feeding old vegetable scraps to his goats, and it is strongly suspected that contamination of these scraps was the cause of the outbreak.

Orchitis in rams

Veterinarians on the Eyre Peninsula investigated an unusual case of multiple young Border Leicester rams with testicular and scrotal lesions. Six out of 13 animals were affected, with two deaths occurring over a 2-week period. The first case was not inspected but was described as having dark, swollen testes at death. Although multiple scrotal lesions are not rare in British breed rams, the association with deaths was out of the ordinary. *Brucella ovis* was ruled out. All but one affected ram had been shorn a few weeks earlier, but there was no evidence of shearing wounds. Necropsy of one sheep revealed a suppurative pyelonephritis. Samples were collected from lesions in several animals. Cultures revealed *Arcanobacterium pyogenes* in one case, and *Actinobacillus seminalis* in another case. No other lesions cultured positive for any bacteria. Given the above result, and with a presumptive diagnosis of *Clostridium* spp. for the first case, it was concluded that there were probably several different causes for the lesions, and that this was not an outbreak situation.

Coccidiosis in feedlot sheep

During June 2007, a property in the mid-north of the State reported deaths of 10-month-old wethers in a feedlot. Ten out of 450 animals died over a period of a few days. Only one group of sheep was affected, and these had recently been introduced to the feedlot from a pastoral property in the north of the State. Signs observed in the affected group included bloody diarrhoea and recumbency, with up to 30% of animals affected. Laboratory fecal testing demonstrated severe coccidiosis. The sheep were treated with oral and parenteral antibiotics, and clinical signs and deaths reduced dramatically. The producer also removed topsoil from the affected yards and treated them with lime to reduce oocyst contamination.

The history of movement of the sheep, causing stress, is consistent with the start of this outbreak. Similar cases have occurred when sheep are put through pastoral property yards that are used for holding feral goats, and this may also have been the source of infection for this group of sheep.

Brucella ovis in rams

An investigation into a prolonged lambing period in recent seasons in a commercial cross-breed lamb enterprise in the Adelaide Plains identified the cause as ovine brucellosis (OB) infection (caused by *Brucella ovis*) in the rams.

Initially, an examination of the 18 working rams on the property found that two had lesions of the epididymis. Subsequent serological complement fixation testing detected 12 animals testing positive for *B. ovis*. The serologically positive animals were removed from the flock, and the six OB-negative rams were retested 2 weeks later. Replacement rams were purchased from an OB-negative accredited stud. The tested negative rams and the new group were kept as two separate groups during joining, and all rams were retested negative 2 months later, at the end of mating.

In the 2007 season, the lambing percentage for the flock was marginally higher than for previous years, but a notable improvement was that lambing was much more concentrated, allowing for better management of the lambs. This is consistent with the reduction in the number of ewes that had to be re-mated following eradication of *B. ovis*; more ewes conceived during their first cycle with the rams.

Erysipelas in emus

An emu producer in the Loxton area contacted his local veterinary practitioner after losing a dozen birds, aged about 1 year, from a flock of 1000. Material submitted to the laboratory for histopathology showed lesions similar to those seen in chlamydophilosis. The veterinarian contacted the Department of Primary Industries and Resources, South Australia, and was advised that a full carcase should be examined and used for specimen collection. Upon necropsy of a submitted bird, the only unusual gross abnormality noted was the presence of extensive petechiation of the serosal gut surface. It was thought that this might have been agonal haemorrhage, although it was somewhat more extensive than usual. *Erysipela rhusiopathiae* was cultured from the lung.

Further discussion with the owner revealed that he had had a similar mortality problem in the same paddock in 2005 at about the same time, just after the break in the dry season. Review of the literature indicates that a similar picture has been seen in free-range turkeys. The owner was advised about a vaccine regime that he could use in the future, and interim treatment with tetracyclines seemed to provide a marked improvement in the clinical condition of sick birds. The birds were also moved out of the original paddock. The owner reported no new cases.

Tasmania

Contributed by: Mary Lou Conway, Department of Primary Industries, Water and Environment

Neurological disease in foals

A case of neurological disease in weanling foals was investigated after being reported by a private practitioner who had observed tetanus-like signs in one of a group of foals.

The property held various groups of horses that were rotated around several intensively grazed paddocks. The paddocks were harrowed after each grazing period. The foals shared their paddock with an adult donkey, and free-ranging poultry accessed all paddocks, feed bins and water troughs. A septic outlet ('french drain') ran across the affected paddock. All horses were wormed quarterly with benzimidazole and macrocyclic lactone preparations, alternately.

Five foals of a group of six were affected, and two of these died. The first case showed tetanus-like signs (sawhorse stance, raised tail, lock jaw), as well as an uncharacteristic 'goose-stepping' gait. This animal was euthanised on welfare grounds and was disposed of without a necropsy.

The second case was observed with depression, head pressing and muscle rigidity. It was treated with penicillin, tetanus antitoxin and an anti-inflammatory preparation. The animal's condition improved over the next few days. The subsequent three cases, which developed over the next day, showed increasing colic-like signs. They received the same treatment regime as the second case. However, one deteriorated, with head pressing and profuse diarrhoea, and died suddenly several hours after treatment. A necropsy of this animal was conducted.

Gross pathology indicated acute septicaemia, with petechial haemorrhages throughout the carcase and micro-abscesses in the liver. There appeared to be a significant parasitic burden, with large numbers of cyathostomes associated with ulcers in the stomach, and many small nematodes on the distal bowel mucosa. The large bowel wall was very oedematous and the mucosal surface had a roughened appearance. On histology, the most significant finding was the intestinal pathology: the intestinal mucosa were packed with nematodes, and the mucosal integrity was severely damaged, with areas of necrosis containing masses of proliferating bacteria. *Salmonella* Typhimurium was cultured from the liver and bowel.

It was concluded that the neurological signs were the result of secondary salmonellosis, following parasite-related gut damage. Neither the donkey nor the remaining foal showed any clinical abnormality. The unaffected foal was older than those affected. Severe pasture contamination appears to be the most likely cause.

Laboratory accessions[a]

Source	Number of accessions
Aquaculture	92
Companion	144
Livestock	498
Other	4
Wildlife	130

a The number of accessions finalised per animal group during the past quarter

Notifiable diseases

The following table lists finalised investigations in the past quarter in which Tasmanian notifiable diseases were excluded by the diagnostic procedure. Only those diseases not reported elsewhere are included in the table.

Notifiable diseases

	Investigations	
Disease	Positive	Total
Abalone ganglioneuritis	0	2
American foul brood	3	6
Avian chlamydophilosis	1	5
Bacterial kidney disease (*Renibacterium salmoninarum*)	0	1
Brucella ovis	0	8
Chalkbrood	0	6
Devil facial tumour disease	12	26
Equine herpes virus 1 (abortigenic and neurological strains)	0	1
European foul brood	0	6
Furunculosis (*Aeromonas salmonicida* ssp. *salmonicida*)	0	1
Goldfish ulcer disease (*Aeromonas salmonicida*, goldfish atypical strain)	0	1
Hydatid disease	1	6
Johne's disease	1	6
Leptospira hardjo	2	11
Leptospira pomona	2	11
Listeria monocytogenes	2	10
Marine aeromonad disease (*Aeromonas salmonicida*, marine atypical strain)	1	1
Perkinosis of shellfish	0	2
Piscirickettsiosis	0	1
Clinical salmonellosis	17	93
Rickettsia-like organism of salmonids	4	8
Salmonella Abortusovis	0	16
Salmonella Abortusequi	0	1
Salmonella Enteritidis	0	8
Pullorum disease (*Salmonella* Pullorum)	0	8
Transmissible spongiform encephalopathy	0	4

Victoria

Contributed by: Cameron Bell, Department of Primary Industries

Bacterial endocarditis in an Angus bull

Bacterial endocarditis was confirmed in a 5-year-old Angus bull near Ballarat in south-west Victoria in May 2007. The bull had a 3-week history of increasing lethargy, inappetence, marked weight loss and lack of libido. Five days before being euthanised, the bull exhibited neurological signs of stumbling, knuckling over at the fetlocks and changes in demeanour. Necropsy examination revealed white, friable necrotic material covering the right atrio-ventricular valve and widespread petechial haemorrhage on the serosal surfaces of the heart, gall bladder, small intestine and diaphragm. *Escherichia coli*, an uncommonly reported cause of vegetative endocarditis in domestic animals, was confirmed in this case in smears and culture.

Nitrate toxicity in beef cattle

Fourteen adult beef cattle in a herd of 24 died suddenly at a property east of Bendigo in April 2007. Anthrax was excluded, and a diagnosis of nitrate toxicity was made. Cattle were found dead, with blood-stained discharges from the anus and nostrils, approximately 18 hours after feeding on pasture hay and vegetable scraps sourced from a Melbourne processing factory. The paddocks contained minimal dry native pasture, and the hay tested negative for nitrates. All of the vegetable offcuts had been consumed, so no sample was available for testing, but they were strongly suspected as the toxic source. Nitrate poisoning was diagnosed as the cause of death by aqueous humour. The vegetable offcuts were removed from the diet, and no further deaths have occurred.

Sudden death in beef cattle

A property owner in the King Valley area, in north-east Victoria, reported sudden deaths in a mob of 30 cattle grazing green paddocks following recent autumn rainfall. An on-property visit was undertaken because the cattle had died suddenly overnight with bloody discharges from mouth, nose and anus, and had rapidly developed subcutaneous emphysema. The cattle were grazing a lush clover and ryegrass pasture, and an old silage bale was supplied as supplementary feed 2 days before the first death. A carcase recently necropsied by the owner was inspected. The spleen was visible and appeared grossly normal, so anthrax was discounted. The subcutaneous emphysema was limited to the subcutis and between the muscle layers. The muscle tissue was pale, with no dark red-black necrotic zones or oedema. Petechial haemorrhages were detected over the subcutis. The liver was a pale fawn-tan colour, had a soft though firm texture, and was collapsed compared with a normal, healthy liver. Darker necrotic foci were present on the liver's diaphragmatic surface, and there was inflammation of the bile ducts. Adult fluke were not present, although scarring indicated past exposure. No other significant lesions were detected grossly. The necropsy and poor vaccination history support a diagnosis of black disease (infectious necrotic hepatitis caused by *Clostridium novyi*). The owner was advised to immediately vaccinate against the clostridial diseases and to expect further deaths until the vaccination produced an active immunity. Moving the cattle from the lush pasture was discussed, but the remaining property areas had a similar amount of pasture and the same potential risk of accelerating gut bacterial proliferation. This case provides a timely reminder of the need to maintain vaccination during drought events.

Post-fire hoof changes in Hereford cattle

Forty-five Hereford heifers were being agisted on a property in the Tolmie-Archerton area, in north-east Victoria, in mid-January 2007 when local bushfires occurred. Three heifers were sent for emergency slaughter due to severe hoof separation at the time of the fires, and a bull, four heifers and a bull calf were lost as a result of the fires. At the time of the fires, the cattle were of condition score 3, and a number had been recently purchased as pregnancy-tested in-calf. After the fires, the cattle were moved to another property in the district, which was severely affected by the drought, and supplementary feeding was introduced. In late May, some of the cattle began to show lameness, with a number aborting and losing body condition rapidly over a few weeks. Hoof separation was evident in one heifer examined, and early hoof changes were seen in another. This line of separation was approximately 1–2 cm below the coronet and affected all four hooves. The stress fracture of the hoof wall can be explained by subclinical injury to the coronet at the time of the fires, with resultant weakening of the developing hoof wall. Post-fire nutritional stress would have been a major factor in the weakening of the developing hoof wall, and the onset of wetter weather conditions could have contributed by softening the hooves. The owner was advised to send the affected stock for immediate slaughter and to regularly inspect the remaining heifers.

Acute bovine liver disease in dairy cattle

Acute bovine liver disease (ABLD) led to the deaths of two adult dairy cows and severe photosensitivity in eight others from a herd of 160 on a property near Sandy Creek in the upper north-east of Victoria in late May 2007. The affected cows were of mixed ages and in full production. Immediately before the outbreak, the herd had been grazing undulating ryegrass-rich pasture that had not been grazed for approximately 3 months and had just received 12 mm of rain. Liver histopathology revealed periportal necrosis, which is pathognomonic for ABLD. An unusual feature of the outbreak was the absence of rough dog's tail (*Cynosurus echinatus*) or any significant amount of dry standing pasture.

Photosensitivity in dairy cattle

Thirty out of 120 dairy cows developed photosensitivity on a perennial ryegrass pasture over a 1-month period starting in late May 2007 on a property in the Upper Kiewa Valley in the north-east of Victoria. Serum biochemistry on affected cattle revealed no evidence of acute liver disease, suggesting a primary photosensitisation. Photosensitivity was seen only in the milking herd. Following calving, the cows went from a predominantly *Phalaris* pasture to a freshly sown, nonendophyte, perennial ryegrass pasture, with supplementary triticale given at milking time. It was surmised that the cases were associated with the rich,

rapidly growing perennial ryegrass, as no other primary photosensitising agents were detected. The outbreak led to a loss of potential production, as well as increased labour associated with managing clinical cases.

Hypocalcaemia in ewes and pre- and peri-natal losses in a prime lamb flock

Hypocalcaemia caused recumbency and the death of 33 ewes, with concurrent pre- and peri-natal lamb losses, in a 1000-head prime-lamb flock in May and June 2007 near Yea in north-east Victoria. Three weeks before lambing, the mob of Border Leicester x merino ewes, in body condition score 3 to 4, were moved from a ration of 4 kg of pinched wheat per head per week and 1% limestone ration onto improved pasture, with 2 kg of supplementary grain per head per week and additional hay. Cases of ewes in sternal recumbency and some deaths occurred over the 3 weeks after the change in ration. Forty-six affected ewes responded well to treatment with oral propylene glycol and subcutaneous '4 in 1' (calcium, magnesium, phosphorus and glucose), and did not need repeat treatment. Blood results and aqueous humour indicated hypocalcaemia and high urea, with adequate magnesium. The beta-hydroxybutyrate was normal, ruling out ketosis. Supplementary calcium had been supplied as lucerne hay, calcium blocks and troughs of a salt-limestone mix but there was no evidence that the ewes were eating this. It is recommended that calcium supplementation ceases 4–5 weeks before lambing to encourage mobilisation of body calcium stores; these ewes were not taken off the calcium supplementation early enough.

Concurrently, abortions and ewes with retained fetal membranes occurred, but these were usually not associated with ewe recumbency and hypocalcaemia. Histopathology on one lamb showed evidence of dystocia, and *Campylobacter fetus* subsp. *venerealis* (cattle abortion strain) was isolated. Subsequent testing of two lambs and a placenta revealed *C. fetus* subsp. *venerealis*. Polymerase chain reaction (PCR) testing to verify this strain is pending; *C. fetus* subsp. *fetus* was expected because this is the strain associated with abortion in sheep and cattle.

Recently, five out of 100 Poll Dorset and Border Leicester rams from the flock were found to have scrotal lesions. Laboratory results for these rams were negative for *Brucella ovis*, and testing for *Campylobacter* is pending. It is estimated that 60 lambs have died from 1000 ewes to date.

An unusual manifestation of post-weaning colibacillosis in pigs

During May 2007, mortalities in weaners from a 100-sow farm north of Bendigo increased suddenly from a background level of 2% to around 25%. Dead and dying piglets had swollen eyes, as well as breathing difficulties, which may have been related to a swollen larynx in addition to lung oedema. It was reported that some affected animals had a staggering gait and an unusual, high-pitched squeal. Piglets were usually found dead, so treatment was rarely an option. Fresh samples sent to the Pig Health and Research Unit at Bendigo yielded a heavy to pure growth of haemolytic *Escherichia coli* serogroup O:139. When tested using PCR, these isolates were shown to possess the Stx2e gene, which is responsible for oedema disease in pigs. Oedema of the eyelids and larynx is a common manifestation of the oedema form of colibacillosis. The best method of control of this disease is vaccination of sucker pigs 1 week before weaning. This is the first case of oedema disease diagnosed at the Pig Health and Research Unit at Bendigo in the past decade.

Neurological equine herpes virus 1 infection in a racehorse

A racehorse that developed severe neurological signs following equine herpes virus 1 (EHV-1) infection was euthanised at an equine hospital in south-west Victoria in June 2007. The 6-year-old thoroughbred gelding had been admitted with an injury to the shoulder, but became inappetent a few days after admittance and, 8 days after arrival, developed a mild bilateral nasal discharge. The horse's condition rapidly deteriorated: hind limb ataxia led to recumbency, with paralysis in all limbs and urinary and fecal incontinence. A diagnosis of neurological EHV-1 was confirmed by PCR on multiple samples and histology submitted to the Attwood laboratory of the Department of Primary Industries, Victoria. All in-contact horses were vaccinated against EHV and quarantined for 21 days, and underwent serial serological testing before discharge from the equine hospital. EHV-1 causing respiratory infection is endemic and common in Australia, although it rarely causes abortion storms and neurological disease. Neurological and abortigenic strains of EHV-1 are nationally notifiable.

Western Australia

Contributed by: Fiona Sunderman, Department of Agriculture and Food

Laboratory testing was conducted on 238 investigations of animal disease during the quarter. There was one report of a nationally notifiable disease (ovine Johne's disease) and 11 investigations of suspected nationally notifiable diseases, none of which were confirmed.

All 11 exotic disease investigations were a category 1 alert (low index of suspicion). They involved routine exclusion of avian influenza and Newcastle disease in poultry and other avian species.
A diagnosis of an endemic disease was made in all cases. Also, capripox (goat pox) was excluded in one case of skin disease in a sheep.

Diseases of significance

Pigs

Brachyspira colitis was the cause of wasting and scouring in grower pigs in ecoshelters at Wagin. At necropsy, there was a severe colitis and thickening of ileum, with haemorrhagic mesenteric lymph nodes. A *Brachyspira* sp. bacterium was isolated from the large intestine of two pigs and was also seen in histological sections.

Cattle

Three weaners from a Rocky Gully property with 300 breeder cattle were affected by a condition that caused sloughing of the hooves. The first two animals were affected in spring 2006, then another in the following summer. The third case, during the current quarter, had sore feet and, over 3 weeks, gradually developed severe coronitis, with separation of the hoof and eventual sloughing of the hoof wall.

Calving cattle at Manypeaks were affected by pregnancy toxaemia after being moved to a paddock with sparse feed 3 weeks earlier. They had been supplemented with hay, but had been browsing reeds and grass trees and stripping paperbark trees. Six cows died over a 3-week period after going down for 3–4 days.

Goats

Two cases of severe coccidiosis resulted in mortalities of goats. In one case, the disease killed six of 40 pastoral goat kids brought south to Mingenew. They developed severe diarrhoea when monensin was removed from their rations. Reddening of small intestinal mucosa and marked enlargement of mesenteric lymph nodes were noted.

Sheep

Laminitis caused lameness in 6-month-old weaners at Kojonup being fed hay and 300 g/day of barley. Fifteen of the 800 died over a few weeks, and a further 12 showed clinical signs. Necropsy of an affected animal revealed reddening of the hoof at the coronet.

Fluoroacetate poisoning was the probable cause of weakness and death in 150 of 1500 two-tooth merino wethers at Esperance. No gross lesions were described, but multifocal microscopic areas of myocardial necrosis were seen. The most likely source of the toxin was box poison plant.

An unusual **colitis**, with large numbers of spirochaetes in mucosal crypts, was seen in a mob of weaner sheep at Tenterden. The sheep had a long history of scouring and slowly losing condition that was nonresponsive to multiple anthelmintic drenches. At the time of examination, approximately 20% of the flock were affected and scouring.

Rumenitis with resulting hepatic abscesses was the cause of death in sheep from a property in Moora. Sporadic deaths occurred in a mixed-sex hogget mob being fed oats, wheat and hay. At necropsy, one of two sheep examined had multiple liver abscesses and a severe necrotising rumenitis.

Multiple cases of **caltrop** (*Tribulus terrestris*) **poisoning** caused the deaths of mature mixed-sex Damara-cross sheep at Bruce Rock. Affected sheep had oculonasal discharges and were seeking shade before death. They had been grazing a paddock with a high density of caltrop.

Multiple cases of **vitamin-E-deficiency**-induced myopathy affected weaners in Wickepin and Broomehill. The sheep were grazing stubbles. Some had received vitamin E supplementation, but this was more than 6 weeks earlier.

Poison sedge was suspected as the cause of death in eleven 2-year-old merino ewes from a mob of 300 at Morowa. The sheep were found dead. Necropsy of one showed approximately 3 litres of pink pleural fluid, which clotted on exposure to air.

Hypocalcaemia caused collapse and death in 8–9-month-old Suffolk-merino-cross lambs at Kukerin. The lambs, held in a feedlot, were fed oats, barley, lupins and hay for more than 2 months. When they were moved, many collapsed. Although they recovered after resting, survivors often walked with a stiff gait. Blood samples taken before euthanasia showed marked hypocalcaemia.

Hydatid cysts were identified in two livers retained by Australian Quarantine and Inspection Service inspectors from a line of 652 good-quality ewes from Lake Grace. Large multilocular cysts with capsules that shelled easily were submitted. Microscopy of an aspirate of cyst fluid and histological examination proved positive for *Echinococcus* spp.

Wildlife

Numerous rosellas were seen ill before dying from **chlamydophilosis** (psittacosis) in and around a garden at Redmond. Microscopic lesions in the liver and spleen of one bird that was examined were confirmed by immunohistochemistry as consistent with chlamydophilosis.

Quarterly disease statistics

Control activities

Ovine brucellosis

Contagious epididymitis, caused by *Brucella ovis*, is present in commercial flocks at a low level that varies around the country. Voluntary accreditation programs (usually in stud flocks) for ovine brucellosis freedom are operating in all States. Table 1 shows the number of accredited flocks at the end of the quarter.

Table 1 Ovine brucellosis accredited-free flocks at 30 June 2007

State	Free
ACT	0
NSW	948
NT	0
QLD	58
SA	511
TAS	0
VIC	362
WA	176
AUS	2055

Johne's disease

In Australia, Johne's disease occurs primarily in dairy cattle and sheep, and to a lesser extent in beef cattle, goats, deer and camelids. Infection with sheep strains occurs to varying extents across the sheep producing regions of southern Australia but has not been detected in Queensland. Cattle strains are endemic in south-eastern Australia but surveillance programs have not identified endemic infection in Queensland, Western Australia or the Northern Territory, and active measures are taken to stamp out any incursions. Table 2 shows the number of herds and flocks known to be infected.

Table 2 Number of herds or flocks infected with Johne's disease at 30 June 2007

State	Cattle	Goat	Deer	Sheep	Total
NSW	111	8	1	1286	1406
NT	0	0	0	0	0
QLD	0	1	0	0	1
SA	77	1	1	74[a]	153
TAS	16	3	0	58	77
VIC	912	4	5	432	1353
WA	0	0	0	17	17
AUS	1116	17	7	1867	3007

a Nine of these flocks are infected with 'c' strain.

New approaches based on risk assessment and management have been developed to control Johne's disease. Market Assurance Programs are in operation for cattle, sheep, goat and alpacas; the number of herds or flocks that have reached a status of Monitored Negative 1 or higher are shown in Table 3.

Table 3 Herds or flocks with a Market Assurance Program status of at least Monitored Negative 1 at 30 June 2007

State	Alpaca	Cattle	Goat	Sheep	Total
NSW	112	525	34	326	997
NT [a]	0	0	0	0	0
QLD [a]	0	0	0	0	0
SA	40	264	11	196	511
TAS	1	110	4	31	146
VIC	22	284	1	89	396
WA	0	0	0	0	0
AUS	175	1183	50	642	2050

a Herds or flocks in free or protected zones have a status of Monitored Negative 1 or better because of the zone status.

Lists of beef, goat and alpaca herds and sheep flocks assessed in the Market Assurance Programs are available at http://www.animalhealthaustralia.com.au/programs/jd/maps.cfm.

Information about components of the National Johne's Disease Control Program can be obtained from State coordinators and Animal Health Australia's Johne's Disease coordinator, David Kennedy (02 6365 6016).

Enzootic bovine leucosis

Enzootic bovine leucosis accreditation programs have been operating in the dairy industries in Queensland and NSW for several years. Victoria, South Australia, Western Australia and Tasmania are undertaking a program of bulk milk testing of all dairy herds. Table 4 shows the number of dairy herds tested free of enzootic bovine leucosis at the end of the quarter.

Table 4 Dairy herds tested free of enzootic bovine leucosis at 30 June 2007

State	Infected	Non-assessed	BMT[a] negative	Provisionally clear	Monitored free	Total
NSW	0	22	31	0	875	928
NT	0	0	0	0	0	0
QLD	2	0	0	0	677	679
SA	0	2	0	0	358	360
TAS	0	486	0	0	0	486
VIC	28	17	1892	22	3009	4968
WA	0	0	0	0	217	217
AUS	30	527	1923	22	5136	7638

a Bulk milk test

Laboratory testing

Table 5 shows the results of serological testing for a range of viral diseases from routine laboratory submissions for the quarter.

Table 5 Serological testing from routine submissions to State laboratories

	Akabane[a]		Bovine ephemeral fever[a]		Bluetongue[a]		Enzootic bovine leucosis		Equine infectious anaemia		Equine viral arteritis	
	Tests	+ve	Tests	+ve	Tests	+ve	Tests	+ve	Tests	+ve	Tests	+ve
Apr–Jun 2006	1970	460	1398	290	2492	297	1341	3	740	1	281	6
Jul–Sep 2006	2724	392	1302	152	6670	318	723	0	975	1	542	4
Oct–Dec 2006	7493	439	1931	313	10896	365	1946	8	1254	2	386	13
Jan–Mar 2007	2924	304	1512	227	10267	177	2099	1	1172	1	468	2
Apr–Jun 2007												
NSW	524	254	233	42	3855	105	417	0	731	0	452	2
NT	595	239	429	132	519	150	0	0	1	0	0	0
QLD	290	116	327	67	290	42	191	0	314	0	0	0
SA	0	0	0	0	1	0	1	0	0	0	1	0
TAS	3	0	0	0	3	0	5	0	0	0	0	0
VIC	206	0	172	0	264	0	239	0	257	0	215	4
WA	581	25	43	13	640	29	11	0	57	0	80	0
AUS	2199	634	1204	254	5572	326	864	0	1360	0	748	6

a http://www.animalhealthaustralia.com.au/programs/adsp/namp/namp_home.cfm

Surveillance activities

National Transmissible Spongiform Encephalopathies Surveillance Program

Table 6 Transmissible spongiform encephalopathy surveillance

	Apr–Jun 2006		Jul–Sep 2006		Oct–Dec 2006		Jan–Mar 2007		Apr–Jun 2007	
State	Cattle	Sheep	Cattle	Sheep	Cattle	Sheep	Cattle	Sheep	Cattle	Sheep
NSW	17	16	34	27	24	65	15	33	17	15
NT	10	0	10	0	3	0	0	0	2	0
QLD	49	8	76	10	50	11	38	13	35	5
SA	5	4	13	15	3	41	4	18	7	22
TAS	2	1	6	0	1	7	2	0	2	1
VIC	32	47	39	36	15	44	23	21	25	17
WA	7	23	15	17	5	92	9	18	11	19
AUS	122	99	193	105	101	260	91	103	99	79

The National Transmissible Spongiform Encephalopathies Surveillance Program (NTSESP) is an integrated national program jointly funded by industry and governments to demonstrate Australia's ongoing freedom from bovine spongiform encephalopathy and scrapie, and to provide early detection of these diseases should they occur. Table 6, above, summarises the activity of the program over the past five quarters. All specimens tested were negative for transmissible spongiform encephalopathies. Information about the NTSESP is available at http://www.animalhealthaustralia.com.au/aahc/programs/adsp/tsefap/ntsesp.cfm.

Contact: Duncan Rowland, Animal Health Australia's NTSESP National Coordinator

Bovine brucellosis

Although bovine brucellosis is now exotic to Australia, surveillance is maintained through abortion investigations and miscellaneous testing of cattle for export or other reasons. As shown in Table 7, 62 abortion investigations were performed during the quarter, all with negative results for bovine brucellosis.

Table 7 Surveillance for bovine brucellosis

	Abortion		Other reasons	
	Tests	+ve	Tests	+ve
Apr–Jun 2006	204	0	1702	0
Jul–Sep 2006	120	0	4456	0
Oct–Dec 2006	167	0	2383	0
Jan–Mar 2007	78	0	1632	0
Apr–Jun 2007				
NSW	0	0	846	0
NT	6	0	0	0
QLD	0	0	249	0
SA	0	0	1	0
TAS	0	0	5	0
VIC	0	0	278	0
WA	56	0	1782	0
AUS	62	0	3161	0

Salmonella surveillance

The National Enteric Pathogen Surveillance Scheme (NEPSS) is operated and maintained on behalf of the Australian, State and Territory governments by the Microbiological Diagnostic Unit at the University of Melbourne. Data on isolates of salmonellae and other pathogens are submitted to NEPSS from participating laboratories around Australia. Quarterly newsletters and annual reports of both human and nonhuman isolates are published, and detailed data searches are provided on request to NEPSS. Table 8 summarises *Salmonella* isolations from animals notified to NEPSS for the quarter.

Contact: Diane Lightfoot, National Enteric Pathogen Surveillance Scheme, Microbiological Diagnostic Unit, University of Melbourne

Table 8 Salmonella notifications, 1 April to 30 June 2007

	Birds	Cats	Cattle	Dogs	Horses	Pigs	Sheep	Other	Total
S. Bovismorbificans	0	0	33	2	2	0	1	2	40
S. Dublin	0	0	15	1	0	0	0	0	16
S. Infantis	0	1	5	3	0	0	0	0	9
S. Typhimurium	14	1	103	7	6	5	7	2	145
Other	4	5	76	21	4	16	1	42	169
Total	18	7	232	34	12	21	9	46	379

Tuberculosis

Australia was declared free from bovine tuberculosis (TB) on 31 December 1997, exceeding the World Organisation for Animal Health (OIE) requirements for declaration of country freedom. The last outbreaks of TB were detected in buffalo in January 2002 and in cattle in December 2000, and trace-forward and trace-back slaughter were carried out according to the Tuberculosis Freedom Assurance Program (TFAP).

All Australian laboratories supporting TFAP are accredited for veterinary testing by the National Association of Testing Authorities under ISO/IEC 17025. Laboratories approved for culture of *Mycobacterium bovis* must pass an external quality assurance program run by the Australian reference laboratory for TB on an annual basis.

The National Granuloma Submission Program has been the major surveillance tool for TB since 1992. Table 9 summarises results from the program.

Table 9 Results of the National Granuloma Submission Program

	Apr–Jun 2006	Jul–Sep 2006	Oct–Dec 2006	Jan–Mar 2007	Apr–Jun 2007
Submitted	371	378	209	178	214
TB +ve	0	0	0	0	0

Northern Australia Quarantine Strategy

In recognition of the special quarantine risks associated with Australia's sparsely populated northern coastline, the Australian Quarantine and Inspection Service conducts an animal disease surveillance program as an integral component of the Northern Australia Quarantine Strategy (NAQS). The NAQS surveillance program provides early warning of disease threats to livestock industries and, in some cases, to human health. NAQS surveillance activities include both offshore and onshore components. Information is derived from the use of sentinel animals, structured surveys and opportunistic sampling. Table 10 summarises NAQS activity in Australia over the past five quarters.

Contact: Jane Parlett, Australian Quarantine and Inspection Service, Australian Government Department of Agriculture, Fisheries and Forestry

Table 10 Summary of recent NAQS activity in Australia

	Apr–Jun 2006		Jul–Sep 2006		Oct–Dec 2006		Jan–Mar 2007		Apr–Jun 2007	
Category	Tested	+ve	Tested	+ve	Tested	+ve	Tested	+ve	Tested	+ve
Aujeszkys disease	16	0	147	0	225	0	0	0	0	0
Australian bat lyssavirus	4	0	0	0	2	0	1	0	0	0
Avian influenza — highly pathogenic	0	0	413	0	1835	0	0	0	32	0
Classical swine fever	16	0	147	0	225	0	0	0	107	0
Japanese encephalitis	193	0	51	0	71	0	45	0	15	0
Surra — *Trypanosoma evansi*	334	0	124	0	185	0	156	0	96	0

Ports Surveillance Program

Biosecurity Australia conducts the Ports Surveillance Program for *Culicoides*, screw-worm fly, exotic bees and bee mites. Seaports, particularly those servicing returning livestock vessels and those dealing with high-risk deck cargo such as timber, mining equipment and containers, are considered to be high-risk locations for incursions of such pests. The program increases the capacity to detect any incursions at an early stage, and this in turn increases the probability of a successful eradication program. The *Culicoides* surveillance also supports the livestock export trade by confirming the continuous or seasonal absence of *Culicoides* vectors at ports from which livestock are loaded. Table 11 shows the number of times that insect trap sites were inspected for the Port Surveillance Program; no exotic insects or mites were detected.

Contact: Iain East, Office of the Chief Veterinary Officer and Howe Heng, Biosecurity Australia, both of the Australian Government Department of Agriculture, Fisheries and Forestry

Table 11 Ports Surveillance Program: number of inspections of insect traps

		Apr–Jun 2006	Jul–Sep 2006	Oct–Dec 2006	Jan–Mar 2007	Apr–Jun 2007
Ports	Asian bees	7	6	17	12	32
	Varroa mites	34	17	26	22	26
	Asian mites	34	17	26	22	26
	Tracheal mites	33	18	43	29	29
	Culicoides sp.	30	27	28	27	29
	Screw-worm fly	24	23	20	21	21
NAQS	Screw-worm fly	45	45	45	45	45

Zoonoses

The National Notifiable Diseases Surveillance System (NNDSS) of the Communicable Diseases Network Australia collects statistics about many human diseases. A summary of information about five important zoonoses is submitted to NAHIS each quarter (see Table 12).

Contact: National Notifiable Diseases Surveillance System, Australian Government Department of Health and Ageing (http://www9.health.gov.au/cda/Source/CDA-index.cfm)

Table 12 Notification of zoonotic disease in humans

	Q2 2006	Q3 2006	Q4 2006	Q1 2007	Q2 2007	Current quarter (Apr–Jun 2007)								
			AUS			ACT	NSW	NT	QLD	SA	TAS	VIC	WA	AUS
Brucellosis	5	14	10	15	7	0	1	0	5	0	0	0	1	7
Chlamydophilosis	39	38	46	30	24	0	10	0	0	1	1	12	0	24
Leptospirosis	59	20	15	48	33	0	3	0	25	0	0	4	1	33
Listeriosis	7	14	13	17	8	0	5	0	0	0	1	2	0	8
Q fever	89	100	104	121	116	0	50	2	42	11	0	9	2	116

Australian Milk Residue Analysis Survey

The Australian Milk Residue Analysis (AMRA) Survey provides a national, independent monitoring system for residues of agricultural and veterinary chemicals and environmental contaminants in raw cow's milk. The survey underpins the export requirements of the Australian Quarantine and Inspection Service for dairy products, and facilitates access to major export markets through demonstrating compliance with both European Union and other importing countries' requirements. It is coordinated by Dairy Food Safety Victoria on behalf of the Australian New Zealand Dairy Authorities' Committee for the Australian dairy industry. The AMRA Survey is risk based, and is designed to identify, monitor and manage potential chemical inputs into Australian dairy production that may affect dairy food safety. The survey makes an overall assessment of the effectiveness of the range of controls in place to deliver food safety outcomes with respect to chemicals used in dairy production, as well as focusing on particular chemicals that may pose a higher risk of residues being identified in milk. The risk profile of potential contaminants is reviewed annually. Table 13 is a summary of the results for the 2006–07 year. Over this period, 950 milk samples were collected, and a total of 12 580 analyses were conducted. No residues were detected at a level above the maximum residue limit specified in the *Australia New Zealand Food Standards Code*.

Contact: Kristy Venten, Dairy Food Safety Victoria

Table 13 Australian milk residue analysis (each pair of figures gives the number of samples above the maximum residue limit and the number of samples tested)

	NSW		NT		QLD		SA		TAS		VIC		WA		Total	
Aflatoxin M1	0	5	0	0	0	40	0	5	0	0	0	10	0	0	0	60
Antimicrobials	0	36	0	0	0	18	0	20	0	18	0	196	0	12	0	300
Benzimidazoles	0	8	0	0	0	4	0	5	0	4	0	46	0	3	0	70
Levamisole	0	3	0	0	0	1	0	1	0	1	0	13	0	1	0	20
Macrocyclic lactones	0	25	0	0	0	13	0	14	0	13	0	137	0	8	0	210
Organochlorines	0	4	0	0	0	2	0	2	0	2	0	19	0	1	0	30
Organophosphates	0	24	0	0	0	12	0	14	0	12	0	130	0	8	0	200
Synthetic pyrethroids	0	24	0	0	0	12	0	14	0	12	0	130	0	8	0	200
Triclabendazole	0	5	0	0	0	0	0	0	0	10	0	45	0	0	0	60
Total	0	134	0	0	0	102	0	75	0	72	0	726	0	41	0	1150

National Residue Survey

During the second quarter of 2007, 2514 samples were collected and analysed in the National Residue Survey Random Monitoring Program (see Table 14). Six samples were found with residues above the relevant standard in the *Australia New Zealand Food Standards Code*.

Four samples of liver from sheep were found with lead residues over the Australian maximum level (ML) of 0.5 mg/kg. These samples contained 0.55 mg/kg, 0.57 mg/kg, 0.59 mg/kg and 1.39 mg/kg, respectively. In the first three cases, no cause could be identified, and an investigation into the fourth case is ongoing. Lead residues in animals are often the result of exposure to old lead batteries or other lead sources dumped inappropriately.

Two samples of sheep liver had cadmium levels above the ML of 1.25 mg/kg. Cadmium residues above the ML are a common finding in older sheep across southern Australia. Although these cadmium detections were above the ML, they were all below the action level of 2.5 mg/kg required to initiate a trace-back investigation.

Contact: Jim Derrick, National Residue Survey, Australian Government Department of Agriculture, Fisheries and Forestry

Table 14 National Residue Survey (each pair of figures gives the number of residues above the maximum residue limit (or the maximum level), and the number of samples tested)

		NSW		NT		QLD		SA		TAS		VIC		WA		AUS	
Anthelmintics	cattle	0	52	0	2	0	71	0	13	0	2	0	28	0	7	0	175
	pigs	0	18	0	0	0	14	0	4	0	0	0	17	0	5	0	58
	sheep	0	48	0	0	0	7	0	16	0	1	0	21	0	9	0	102
	other	0	8	0	0	0	10	0	0	0	0	0	3	0	6	0	27
	Total	0	126	0	2	0	102	0	33	0	3	0	69	0	27	0	362
Antimicrobials	cattle	0	64	0	0	0	105	0	14	0	4	0	66	0	6	0	259
	pigs	0	72	0	0	0	58	0	17	0	4	0	38	0	26	0	215
	poultry	0	57	0	0	0	22	0	14	0	7	0	37	0	14	0	151
	sheep	0	54	0	1	0	8	0	23	0	2	0	27	0	20	0	135
	other	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	3
	Total	0	247	0	1	0	193	0	69	0	17	0	170	0	66	0	763
Growth promotants	cattle	0	48	0	1	0	71	0	13	0	17	0	21	0	9	0	180
	pigs	0	38	0	0	0	40	0	16	0	0	0	21	0	11	0	126
	poultry	0	4	0	0	0	1	0	2	0	1	0	3	0	1	0	12
	sheep	0	45	0	0	0	11	0	19	0	2	0	17	0	24	0	118
	other	0	1	0	0	0	1	0	3	0	0	0	1	0	0	0	6
	Total	0	136	0	1	0	124	0	53	0	20	0	63	0	45	0	442
Insecticides	cattle	0	60	0	1	0	119	0	24	0	8	0	57	0	11	0	280
	pigs	0	20	0	0	0	20	0	4	0	3	0	14	0	5	0	66
	sheep	0	73	0	0	0	24	0	36	0	0	0	26	0	37	0	196
	other	0	11	0	0	0	31	0	1	0	1	0	3	0	1	0	48
	Total	0	164	0	1	0	194	0	65	0	12	0	100	0	54	0	590
Metals	cattle	0	13	0	0	0	25	0	5	0	2	0	13	0	3	0	61
	pigs	0	23	0	0	0	15	0	8	0	1	0	15	0	0	0	62
	sheep	0	18	0	0	0	3	0	6	0	1	5	15	1	5	6	48
	other	0	1	0	0	0	8	0	0	0	0	0	0	0	0	0	9
	Total	0	55	0	0	0	51	0	19	0	4	5	43	1	8	6	180
Miscellaneous	cattle	0	15	0	0	0	22	0	2	0	0	0	12	0	4	0	55
	pigs	0	23	0	0	0	14	0	7	0	2	0	10	0	3	0	59
	sheep	0	21	0	0	0	4	0	4	0	1	0	18	0	14	0	62
	other	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
	Total	0	59	0	0	0	40	0	13	0	3	0	41	0	21	0	177
Total		0	787	0	5	0	704	0	252	0	59	5	486	1	221	6	2514

Suspect exotic or emergency disease investigations

There were 48 investigations of diseases, suspected to be either exotic or a possible emergency, reported during the quarter, as shown in Table 15. More details about some of these investigations can be found in the State and Territory reports.

Table 15 Exotic or emergency disease investigations reported, 1 April to 30 June 2007

Disease	Species	State	Month	Response code	Finding
Avian influenza — highly pathogenic	Avian	NSW	May	2	negative (2 unrelated investigations)
	Avian	NT	Apr	2	negative (3 unrelated investigations)
	Avian	NT	Jun	2	negative
	Avian	QLD	Apr	2	tracheitis (2 unrelated investigations)
	Avian	QLD	Apr	2	negative (3 unrelated investigations)
	Avian	QLD	Apr	2	botulism
	Avian	QLD	Apr	2	negative
	Avian	QLD	Jun	2	negative (2 unrelated investigations)
	Avian	QLD	Jun	2	trauma
	Avian	QLD	Jun	3	negative
	Avian	QLD	Jun	2	organophosphate poisoning
	Avian	TAS	May	2	negative
	Avian	TAS	Jun	2	negative
	Avian	VIC	Apr	3	negative (2 unrelated investigations)
	Avian	VIC	May	3	negative (3 unrelated investigations)
	Avian	VIC	Jun	3	negative
	Avian	WA	Apr	2	negative (2 unrelated investigations)
	Avian	WA	May	2	negative
	Avian	WA	Jun	2	negative (6 unrelated investigations)
Bluetongue — clinical disease	Ovine	SA	Apr	3	pasteurellosis
Equine herpes-virus 1 — abortigenic and neurological strains	Equine	VIC	Jun	2	positive
Foot-and-mouth disease	Bovine	NSW	Jun	3	papular stomatitis
	Bovine	VIC	Jun	3	negative
Hendra virus	Equine	NSW	Apr	2	negative
	Equine	NSW	May	2	negative (2 unrelated investigations)
Post-weaning multi-systemic wasting syndrome	Porcine	VIC	May	3	interstitial pneumonia
Scrapie	Caprine	SA	Jun	2	negative
Sheep pox and goat pox	Ovine	WA	May	3	negative
Varroasis — *Varroa destructor*	Bees	QLD	May	3	negative
Vesicular stomatitis	Equine	SA	Apr	3	negative
	Equine	VIC	Apr	3	negative

Key to response codes
1: Field investigation by government officer
2: Investigation by State or Territory government veterinary laboratory
3: Specimens sent to the Australian Animal Health Laboratory (or CSIRO Division of Entomology)
4: Specimens sent to reference laboratories overseas
5: Regulatory action taken (quarantine or police)
6: Alert or standby
7: Eradication

NAHIS CONTACTS

The National Animal Health Information System (NAHIS) collects summaries of animal health information from many sources. NAHIS is on the internet (http://www.animalhealthaustralia.com.au/status/nahis.cfm). Because NAHIS does not duplicate the data in the other systems, the relevant person below should be contacted if further details are required.

Name	Role	Phone	Fax	email
Kevin de Witte	Animal Health Australia Project Manager	02 6203 3913	02 6232 5511	kdewitte@animalhealthaustralia.com.au
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Iain East	Australian Government NAHIS Coordinator	02 6272 3106	02 6272 3150	iain.east@daff.gov.au
Kristy Venten	Australian Milk Residue Analysis Survey	03 9810 5919	03 9819 4299	kventen@dairysafe.vic.gov.au
Rupert Woods	Australian Wildlife Health Network	02 9978 4749	02 9978 4516	rwoods@zoo.nsw.gov.au
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Diane Lightfoot	National Enteric Pathogen Surveillance Scheme	03 8344 5701	03 8344 7833	dligh@unimelb.edu.au
Neville Spencer	National Granuloma Submission Program	02 6271 6650	02 6272 5442	neville.spencer@aqis.gov.au
Krissa O'Neil	National Notifiable Diseases Surveillance System	02 6289 1555	02 6289 7791	www.health.gov.au
Jim Derrick	National Residue Survey	02 6272 4019	02 6272 4023	jim.derrick@daff.gov.au
Jenny Hutchison	National Surveillance Coordinator	02 6287 4483	02 6287 4468	jenny@ausvet.com.au
Jane Parlett	Northern Australia Quarantine Strategy	02 6272 3494	02 6272 3468	jane.parlett@aqis.gov.au
State Coordinators				
Barbara Moloney	NSW State Coordinator	02 6391 3687	02 6361 9976	barbara.moloney@dpi.nsw.gov.au
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Celia Dickason	SA State Coordinator	08 8391 7125	08 8388 8455	dickason.celia@saugov.sa.gov.au
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Cameron Bell	VIC State Coordinator	03 5430 4545	03 5430 4520	cameron.bell@dpi.vic.gov.au
Fiona Sunderman	WA State Coordinator	08 9368 3805	08 9474 2479	fsunderman@agric.wa.gov.au

EMERGENCY ANIMAL DISEASE WATCH HOTLINE — 1800 675 888

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.

For information about the Emergency Animal Disease Watch Hotline, contact Scott Porteous, Animal Health Australia.

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